

# Adoption of Advanced Technological Solutions in Slovenian Private Security Companies

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## **Purpose:**

The use of advanced technological solutions in security is one of the current development trends in the private security industry. It represents an opportunity for upgrading security services and for resolving human resources issues that private security companies face. The aim of the article is to present the potentials of modern technological solutions for upgrading security services and overcoming contemporary challenges in the field of private security.

## **Design/Methods/Approach:**

For the purpose of the study, we conducted interviews with representatives of the Slovenian private security profession to determine the current challenges in the private security industry, their positions on modern technologies and their feasibility in practice. Interviews were conducted at the head offices of respondents' companies in summer 2019. In total, four interviews were conducted.

## **Findings:**

The results show that general problems on the labour market have a significant impact on private security services in Slovenia, while the lack of competent personnel leads to unregulated working conditions and the inability to provide quality security services. The implementation of advanced technological solutions could address key operational challenges and optimise financial and human resources.

## **Research Limitations/Implications:**

One of the limitations of the study is the small number of interviews. We tried to overcome this limitation by carefully selecting the interviewees and by conducting a thorough, in-depth interview.

## **Originality/Value:**

The study addresses current and important issues and connects with the concepts of digitalisation of companies. This is a topic that is important in both public policing and private policing. The paper thus upgrades and complements existing knowledge in this field.

**Keywords:** private security companies, development trends, advanced technological solutions, technical security, human resources issues

**UDC:** 351.746.2

## **Prevzem naprednih tehnoloških rešitev v slovenskih zasebnih varnostnih podjetjih**

### **Namen prispevka:**

Uporaba naprednih tehnoloških rešitev v varovanju je eden od aktualnih razvojnih trendov v sektorju zasebnega varovanja. Predstavlja priložnost za nadgradnjo varnostnih storitev in reševanje kadrovskih težav, s katerimi se soočajo zasebna varnostna podjetja. Namen prispevka je predstaviti potencialne sodobnih tehnoloških rešitev za nadgradnjo varnostnih storitev in premagovanje sodobnih izzivov na področju zasebnega varovanja.

### **Metode:**

Za namen študije smo opravili intervjuje s predstavniki slovenske stroke zasebnega varovanja, da bi ugotovili aktualne izzive v sektorju zasebnega varovanja, njihova stališča do sodobnih tehnologij in njihovo izvedljivost v praksi. Intervjuji so bili opravljeni na sedežih podjetij anketirancev poleti 2019. Skupno so bili opravljeni štiri intervjuji.

### **Ugotovitve:**

Rezultati kažejo, da splošne težave na trgu dela pomembno vplivajo na zasebne varnostne službe v Sloveniji, pomanjkanje kompetentnega kadra pa vodi v neurejene delovne pogoje in nezmožnost zagotavljanja kakovostnih storitev varovanja. Z uvedbo naprednih tehnoloških rešitev bi lahko rešili ključne operativne izzive ter optimizirali finančne in kadrovske vire.

### **Omejitve/uporabnost raziskave:**

Ena od omejitev študije je majhno število intervjujev. To omejitev smo poskušali preseči s skrbno izbiro intervjuvancev in s temeljitim, poglobljenim intervjujem.

### **Izvirnost/pomembnost prispevka:**

Študija obravnava aktualna in pomembna vprašanja ter se povezuje s koncepti digitalizacije podjetij. To je tema, ki je pomembna tako v javni kot zasebni policiji. Prispevek tako nadgrajuje in dopolnjuje obstoječa znanja s tega področja.

**Ključne besede:** zasebna varnostna podjetja, trendi razvoja, napredne tehnološke rešitve, tehnično varovanje, kadrovska vprašanja

**UDK:** 351.746.2

### 1 INTRODUCTION

In recent years, the private security industry has been facing various changes that affect the restructuring of security methods, as well as approaches to corporate governance and management of private security companies. The most notable trends are related to the digitalisation and automation of business (security) operations, technological innovations, and, consequently, the changes in required competencies and reorganisation of human resources structures (Servoz, 2019). In this respect, advanced technological solutions in technical security certainly represent the more current progressions in private security industry development (El Dorado, 2017). The pursuit of innovation in the security industry is important, as it contributes to more effective implementation of security and exceeds the capacity of traditional technical security systems (Pistorius, 2018).

Although technological development of private security is proceeding rapidly globally, the use of modern technological solutions is not yet an established practice in many European countries. The fact that most private security companies are staunchly relying on traditional approaches is hampering technological development that could contribute to the greater effectiveness of private security services. Therefore, it is important to promote greater flexibility and innovation in private security services. An additional problem in this regard is the regulation that is often lagging behind technological development. New technologies can cause gaps in existing regulation or conflicts with current rules (Leenes et al., 2017). Therefore, law-making and rule-making must become more proactive, dynamic and responsive (Fenwick et al., 2017). Technological advances in the private security industry are also important because they represent an opportunity to reduce human resources issues, which is also one of the fundamental challenges companies have been facing in recent years. The lack of security staff has a negative impact on working conditions, leading to overburdening of employees (Pavšič, 2014), which also affects the quality of security services. In the future, a comprehensive approach will be needed to solve the human resources problem, which is reflected in the introduction of advanced technological solutions that fill the personnel gap and the training of existing personnel in the use and operation of new technologies.

The article thus includes an overview of the current state of human resources problems in (Slovenian) private security companies and a proposal for a solution using advanced technologies, considering the need to adapt the legislation. The findings address existing challenges in the private security industry and promote new security approaches.

The structure of the article is as follows. The next chapter presents the key development challenges that arise in private security and the potentials for using advanced technological solutions to advance private security and solve human resources problems. We compared traditional and modern approaches to security in the private security industry and determined whether advanced technological solutions could help reduce human resources problems. The third chapter presents the study of development trends, challenges and opportunities in private security, which examined how global challenges are reflected in the Slovenian security environment. The fourth chapter presents a discussion of the study

results, whereas the last chapter presents the conclusion with a view towards the future development of private security.

## 2 ANALYSIS OF CURRENT CHALLENGES AND TRENDS IN THE PRIVATE SECURITY INDUSTRY

Among the many trends influencing the development of the private security industry, digital transformation and technological innovations are certainly the most prominent. Technological advances include the creation of new or improvement of existing work methods, support of innovation and introduction of new approaches to business, which in turn affects reductions in costs and workload, improvements of existing products and advancements in the organisation (Radonjič, 2013). Many modern technologies, such as the Internet of Things (IoT) and related sensor technologies, as well as robotics, are already present and, to some extent, established in the private security market (Ludwig, 2018). Trends introducing innovations in technical security include ICT-related technologies, in particular, next-generation mobile devices (such as 5G connectivity) and cloud solutions, augmented reality (AR) and virtual reality (VR), which enable improved communications, data management, and security personnel training, in which realistic scenarios can be developed (Pistorius, 2018).

In line with the abovementioned technological development on the international market, there are various other examples of modern technical means applicable in the field of security: high-definition cameras with built-in high-quality sound, which allow complete documentation of the controlled area (El Dorado, 2017); smart applications for communication between security guards and security control centres, task management, document sharing and tracking (Madakam & Date, 2016); microwave intrusion detection alarms for monitoring open areas, runways, fuel storage areas and other secured facilities (Fiber SenSys, 2012); secure Internet identity with biometric smart cards that only work in conjunction with a specific body; security equipment with electronic chips within the product or coding that only works at a specific location (Davis & Pease, 2000), and AI security cameras that detect suspicious behaviour (Vincent, 2018). In addition to the solutions mentioned, automation and robotics are increasingly being introduced in private security services. Two such examples are security robots and drones, which can be equipped with high-resolution cameras, sensors, automatic recognition systems, access control systems, etc., representing a comprehensive technical security system (Kyung-hoon et al., 2010).

Although the dynamics of technological change can bring new opportunities and strengthen the development of technical security, many private security companies are not yet taking advantage of these new technologies. Some advanced solutions are already noticeable and are becoming a common practice (for example, digital event reports (Sintal Konzern, 2017), electronic alarm security systems (Stinger Security, 2020), SMP automatic patrolling security robot, advanced video surveillance systems (Protect, 2020), however, private security companies in practice still rely on traditional approaches in most cases (video and audio surveillance, sensors, motion detectors and security alarms). Such a situation

is noticeable, for example, in Slovenia. Thus, in the following, when analysing the challenges and investigating the implementation of new technological solutions in practice, we focus in more detail on the experiences from Slovenia. Although certain challenges are country-specific, these problems can be generalised to other comparable European countries.

Technological development and advances depend on many factors, with legal regulation being one of the most significant. In the field of technical security regulation, it is common that legal norms are general in nature and merely stipulate that provision of private security may include the use of technical security systems. These are usually defined as video and audio surveillance systems, technical and mechanical security devices, entry control systems, devices for inspection of luggage or cargo, control systems of the secured areas, and detection and prevention of unauthorised entry. In addition to the general definitions of security systems, legal regulation does not explicitly mention the use of technological innovations or instructions for their safe use. Such a definition of private security measures is established in most European countries, including Slovenia. While on the other hand, for example, the introduction of new technologies and procedures in the field of public security requires a precise risk assessment and definition of their use. This indicates that legal regulations of private security are not modernised and does not address issues related to technological development or the feasibility of using new technologies.

Whether innovations represent completely new technologies or new combinations of existing technologies, it is important to define regulations in the field of legislation further and set minimum standards for their use. Therefore, in the future, legislators will be forced to examine the need for harmonisation and further definition of new approaches to private security provision (Celestina, 2013).

In order to adapt to digital and technological development, it is necessary to develop human resources through continuous education and training and modernising legislation. Although advanced technological solutions are only in the initial stages of use, personnel will need to have appropriate expertise in handling such technology in the future (El Dorado, 2019). Advanced technologies require operators who understand how they work (Bughin et al., 2018), so continuous professional training – which is already not conducted in a sufficient manner – will be required for the new generation of security personnel (Cobbina et al., 2016). However, recruitment, retention and training of security personnel at all levels is currently extremely difficult, as private security companies face major human resources problems (SSI Staff, 2018). This is a global problem that is also evident in Slovenia. A survey conducted by the Employment Service of Slovenia shows that the demand for security personnel is high; for example, a need for almost 700 security guards was observed in 2019 (Zavod RS za zaposlovanje, 2020). The lack of security guards is also observed elsewhere in Europe. In Spain, for example, several private security companies are in bankruptcy proceedings due to human resources problems (González, 2019); in Croatia, companies face an excessive brain drain of specialised personnel abroad (Pavlic, 2016); there is also the high-profile case of the security at the 2012 Olympic Games in Great Britain,

where the military was also involved, due to the inability to provide adequate numbers of security guards (Adams, 2012). These problems can also be observed outside EU member states. In 2018, Japan reported that more than 90 per cent of private security companies face human resources problems. The greatest need is observable for crowd control personnel and security guards, airport security guards and security personnel for facilities protection (Kyodo, 2018). Considering the growing needs and demands for private security services (Nalla & Cobbina, 2017), the lack of security personnel often means that the demand for security is greater than the available workforce. Hence, private security companies are forced to do more with fewer people.

Consequently, there have been several publications in the media in the last several years of security personnel warning of unregulated working conditions, low salaries, poor reputation (G. C., 2013), excessive overtime, disregard for their complexity of work, and overburdened employees (Pavšič, 2014). For example, a survey from Singapore found that about two-thirds of security guards were dissatisfied with their salaries (Lim & Nalla, 2014). Overall, the shortage of security personnel has a negative impact on the private security industry, private security companies, working conditions of security personnel, the quality of security services and, finally, according to Button and Lalonde (2014), on general community safety and crime prevention performance. This situation further exacerbates the unstable private security market. Private security companies often accept orders for security services below standard prices in the private security market, which leads to unfair competition.<sup>1</sup> The consequences of unfair competition are widespread and are reflected in salaries below minimum wage, personnel's dissatisfaction with employment, difficulties in recruiting new personnel, a negative public image, and undermined efforts to improve the quality of services (Savski, 2013).

Due to the growing market demands and limited resources, private security companies need new approaches for providing security services. Solutions can be found in advanced technologies, which enable more efficient allocation of human resources in critical situations, facilitate regular work procedures (SMP Robotics, 2019), reduces working hours of security personnel, reduce costs, and ensure a higher quality of security services (Sunstates Security, 2020). Thus, modern technologies can positively affect jobs and personnel needs in the short and long term. Most notably, the need for recruitment can drop, and the quality of jobs can be improved (Pfeiffer, 2016). However, in achieving such synergies, we must consider that the right approach to introducing digital and technological development in the private security industry inevitably requires many changes in the field of security organisation, human resource structure, and security services.

Hikvision Digital Technology (HDT, 2022) and Ridenhour (2022) anticipate trends in the private security industry in 2022. Advances in security-related technology have made it a viable option for reducing labor costs while improving the level of protection and service provided (Ridenhour, 2022). By all appearances, the private security industry is in a stage of redefining itself (HDT,

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<sup>1</sup> *Unfair competition means »that the action of the company is contrary to good business practice and which causes or is likely to cause harm to other market participants« (»Zakon o preprečevanju omejevanja konkurence [ZPOmK-1G]«, 2017).*

2022). Artificial Intelligence (AI) has been one of the fundamental technologies to reshape the security industry. Currently AI technologies are being used for wider applications, like personal protective equipment detection, automated event alerts, fall detection. In the future Artificial Intelligence of Things (AIoT) will bring more possibilities to the industry, with expanding applications for security devices and systems, moreover cloud-based solutions and services will also become essential (HDT, 2022).

An overview of the general development trends and most significant challenges in private security shows that the advanced technological solutions may be most efficient in the provision of private security services. Two questions arise in this regard. First, what is the contribution of such solutions to work efficiency, and second, can the implementation of such solutions solve current challenges? In order to clarify these issues, we compared the traditional approaches to the provision of security services (i.e. provision of security with security guards) with modern ones (i.e. provision of security supported by advanced technological solutions), and analysed their advantages and disadvantages.

### 2.1 Comparison of traditional and modern approaches to the provision of security in the private security industry

The evaluation parameters used for the comparison of traditional and modern approaches were as follows.

1. *Degree of autonomy and continuity*, where we analysed the levels of independence and overall capabilities of analysed approaches.
2. *Surveillance of secured area*, where we reviewed the surveillance capabilities provided by a particular approach to security.
3. *Threats to security*, where we analysed the risks associated with both approaches.
4. *Costs of security services*, where we investigated which approach to the provision of security is more favourable for a private security company.

The first evaluation parameter is the *degree of autonomy and continuity*. Technological solutions do not have the same operational requirements and needs as human resources (e.g. rest, lunch breaks, vacations) (SMP Robotics, 2019) to ensure effectiveness, so they can constantly operate without interruptions (Turner, 2015). Security guards' working hours are regulated and significantly more limited than operating hours of advanced technological solutions. This reduces the need for personnel, as constant patrols of numerous security guards can be replaced by modern cameras, security robots, drones, or other advanced technological solutions (Marriott, 2020). Unlike human resources, however, surveillance technologies require human supervision. Automation and operation of advanced technological solutions can also cause unexpected problems, such as misinterpretation of sensors, plug-in malfunction, or software errors, leading to severe consequences for residents (Pfeiffer, 2016), especially in the field of security. Furthermore, security guards can resolve a crisis situation appropriately without additional aid (e.g. with proper communication to calm an upset guest) (El Dorado, 2019) or provide first aid (Hill, 2019). Although learning-based programming

can ensure that modern technologies respond to situations according to learned patterns; however, from a security perspective, this is difficult, as it is impossible to predict all possible events (Lin et al., 2009).

The second evaluation parameter is *surveillance of secured area*. A security guard can oversee a limited secured area, whereas larger facilities and areas require additional mechanisms and means, such as security cameras, which also do not provide full surveillance in their traditional form. However, advanced technological solutions with built-in control systems, such as security robots and drones, can provide a 360-degree overview, which is more convenient and high-quality than installing multiple surveillance cameras in one area. Furthermore, they provide more reliable information on events and circumstances, which can be used as evidence in the event of security incidents and criminal offences. Instead of the standard detailed visitor records, advanced technological solutions with more advanced functionalities can provide a record of car registrations or entry of unauthorised persons (Knightscope, n. d.). However, if used inappropriately, such data collection can pose a significant risk of misuse of personal data and excessive invasion of privacy (Papademetriou, 2016), which means that such measures must be properly regulated by law.

The third evaluation parameter is *threats in security*. The work of security guards involves many dangers that can arise when performing this type of work. Examples include burglaries, physical clashes between groups on the streets or rescuing people from danger (Theodoridis & Huosheng, 2012). Security guards patrolling in critical industrial environments may also be exposed to hazardous chemicals, gases or radiation. Such security requires specialised training for security guards and personal protective equipment, such as respirators, high visibility jackets and protective clothing (Button & Lalonde, 2014). In these cases, advanced technological solutions, such as security robots and drones, serve as a substitute for physical presence in the problematic area or as an aid to ensure security guard's readiness and appropriate intervention according to the situation. Nevertheless, the use of advanced technological means also poses certain dangers associated with threats to information and cyber security. The prevalence of digital technology means that we depend on information systems that may be exposed to criminal elements (Grabosky, 2007). Advanced technological solutions can be wirelessly connected to the Internet, which means that they depend on the connection, while various cyber threats can compromise communications and sensitive data security. In addition to intercepting or stealing data, hackers can take control of modern technology, weaken the frequency of connection to the operator or use it for malicious acts (Ludwig, 2018). Because of the complexity of the use of modern technologies, it will cause increased difficulties in investigations and presenting evidence (Davis & Pease, 2000). For digital evidence to be legally admissible in court, it must be credible, accurate, complete and conclusive. However, this is made difficult due to the lack of a robust legal framework for cybercrime and a reliable digital forensic investigation (Yeboah-Ofori & Brown, 2020).

The fourth evaluation parameter is *costs of security services*. The purchase of advanced technological solutions as a one-time expense is a very high investment

but generates economic savings in the long run (Joh, 2017). The traditional approach to the provision of security requires not only human resources (i.e., security guards) but additional technical means, such as video cameras, to provide 24-hour security, which represents additional costs. However, advanced technological solutions can replace the constant patrolling of numerous security guards. Nevertheless, it is important to keep in mind that advanced technological solutions require constant system updates, checks and repairs, resulting in additional operating costs. Management of such technologies also requires personnel with appropriate IT expertise (Bendis, 2016). The cost comparison is therefore not simple; however, practical experience has shown that using advanced technological solutions is a cost-effective decision in the long run. A change in the mentality of security service customers is also needed, which is often the biggest obstacle in introducing advanced technological solutions (Marriott, 2020).

In summary, a comparison of traditional and modern approaches to the provision of security has shown that advanced technological solutions cannot yet operate independently, so human resources are nevertheless needed to control the technology and ensure uninterrupted operations. Both traditional and modern approaches are constrained by regulatory frameworks and guidelines, with the autonomy of people being greater. People can exercise discretion, while technologies are managed by people. Advanced technological solutions are more reliable in terms of surveillance, which can be useful for large facilities or institutions and the protection of critical areas that would pose a life-threatening situation to a security guard. However, the use of advanced technological solutions requires special care in the collection of personal data, in the form of integrated mechanisms that prevent misuse and ensure the implementation of fundamental principles from the perspective of information/cyber security and data/privacy protection. Nevertheless, practice examples show that implementing advanced technological solutions helps address key operational challenges and optimise financial and human resources. Even though modern technologies seem more efficient and perhaps even more reliable according to the conducted analysis, the costs of equipment maintenance must be taken into account and all the advantages. Based on the above, we can conclude that while the use of advanced technological solutions could help reduce human resources problems and contribute to problem-solving, this involves additional costs and creates certain reorganisation needs. Nonetheless, combining advanced technical security systems with physical security, will undoubtedly result in the above-standard quality of security.

Based on the overview of the challenges facing the private security industry, we conducted a study of development trends, challenges and opportunities in private security in Slovenia. The purpose of the study was to determine how companies perceive and address these challenges, and what are their views and plans regarding the use of advanced technological solutions in the future.

### 3 DESCRIPTION OF METHOD, QUESTIONNAIRE, AND SAMPLE

#### 3.1 Method

We conducted a qualitative study, which included in-depth semi-structured interviews with representatives of the private security sector in Slovenia.

The target population were private security companies in Slovenia. In order to obtain the best possible data regarding the experience in Slovenian practice, we determined three other specific (inclusion) criteria for the selection of companies, specifically:

- a. location (companies based in different regions of Slovenia);
- b. type of services (the company provides services of physical and technical security); and
- c. size of the company (the company employs at least 150 employees).

To obtain the sample, we used targeted sampling, i.e. we selected a specific group of companies that is as representative as possible in terms of target population and inclusion criteria. To obtain a comprehensive understanding of the challenges facing the private security industry, we also aimed to conduct an interview with a representative of the private security sector on a national strategic level.

#### 3.2 Questionnaire and data collection procedure

Interviews were conducted at the head offices of respondents' companies from 31 July to 8 August 2019. Before conducting the study, we sent invitations for participation to respondents, and they were also informed that the collected data will be used for research purposes. Audio recordings were made of all interviews to be used for transcripts.

For the purpose of interviews, we prepared two different questionnaires: one for interviewing representatives of private security companies, and the other for the representative of the private security sector on a national strategic level, i.e. the president of the Chamber for the Development of Slovenian Private Security (president of the Chamber). The thematic sections of the two questionnaires were aligned, with questions differing according to the purpose of the interview. Interviews with respondents from private security companies were aimed at gaining insight into the challenges faced by Slovenian private security companies, while the interview with the president of the Chamber was aimed at examining the general state of development of the private security industry and market.

Both questionnaires were divided into six sections, followed by open-ended questions and, if necessary, sub-questions. The first questionnaire (Q1) for representatives of private security companies included 53 questions in total, while the second questionnaire (Q2) for the president of the Chamber included 33 questions in total. The questions were developed based on findings from the literature review on human resources problems, modern technologies in the private security market, and the challenges related to the use of advanced technologies. The questionnaire for the president of the Chamber did not include

questions related to the operations of private security companies and instead focused on the state of the Slovenian private security market and the development of the private security industry.

The main sections of the questionnaire were as follows.

1. *Human resources problems*: This section included questions (11 main questions in Q1; seven main questions in Q2) regarding the human resources situation in private security companies and how these human resources problems are being resolved (e.g., Do you think that the lack of staff and the employment of unskilled people for work are noticeably present?; In what way could we address this issue, from the political and sectoral view?; In your opinion, what is the most significant cause of staff shortage?; In what way do you attract new staff to your team?).
2. *Development of employees' competencies and activities*: This section included questions (seven main questions and one sub-question in Q1; five main questions and one sub-question in Q2) about employee training and development of new technical competencies in human resources (e.g., What are the most desirable/sought-after characteristics and knowledge of the employee when performing work in your company?; Considering technological developments, do you plan to develop new technical competencies of human resources in the next two years?; Do you think that any changes are needed at the systemic, state-level regarding the training of security personnel?).
3. *Advanced technological solutions*: This section included questions (six main questions and nine sub-questions in Q1; six main questions and five sub-questions in Q2) regarding respondents' views on the advantages and disadvantages of security provision using advanced technological solutions and the possibility of their integration into current security services (e.g., If you compare the efficiency of advanced technological solutions with the physical protection, what are the advantages and the disadvantages of both means of ensuring security?; What are the potential improvements and dangers of introducing advanced technological solutions in your work?; Do you think that the use of advanced technological solutions could contribute to solving personnel issues?; Are you planning to introduce new technological solutions in your work and services in the next two years?).
4. *Adequacy of legislation*: This section included questions (five main questions and one sub-question in Q1; three main questions in Q2) about respondents' views on the adequacy of the current legislation and proposals for changes (e.g., What are the limitations of Slovenian legislation in introducing innovations in private security in terms of development and staffing?; What changes are needed to make the development of the private security industry faster?).
5. *Future trends*: This section included questions (three main questions in Q1 and Q2) about respondents' views on the challenges that the private security industry will face in the future (e.g., Do you think that private security companies are flexible enough to keep up with developments?;

What do you think are the most important challenges and trends in the future, and what will be the most topical in the field of private security in the future - where will the development of the private security industry go?).

In addition to substantive questions, the questionnaire included questions on respondents' characteristics. Demographic characteristics in Q1 were determined using ten questions related to both the respondent and their private security company (respondent's education and work experience, time frame of the company's existence, number of employees in the company, types of security services provided by the company, types of technical means used in provision of security, types of company clients, and the company's international operations). In Q2, three questions related to demographic characteristics were included (education, years of experience in the field, and professional achievements in the field).

The data obtained was processed using the content analysis method. First, we transcribed the audio recordings. We then analysed the respondents' answers in detail and performed a comparison of data. We performed a cross-analysis of respondents' answers, identified differences in their reported opinions, and studied the diversity of answers to each question. We then interpreted the results to summarise the findings of the analysis.

### 3.3 Sample

Based on the selected target population, 156 private security companies operated in Slovenia at the time of the study. Using the targeted sampling method and considering the selection criteria, we invited six (3.8%) private security companies, and three (50%) companies responded to the invitation. Thus, interviews were conducted with representatives of three private security companies in Slovenia. We also conducted an interview with a representative of the Chamber for the Development of Slovenian Private Security, Mr Branko Slak. In total, we conducted four interviews. The demographic characteristics of the respondents and general data about their companies are presented below.

- The first respondent (R1) from company A is a Bachelor of Law graduate in law with a completed bar examination, who has been in the management position (Head of the legal department) for five years. Company A has been operating for more than 20 years, has more than 150 employees, with security services clients from both the public and private sectors, and operates exclusively in Slovenia.
- The second respondent (R2) from company B is an economic technician by education, and has been the Director of the security company for 10 years; previously he worked as a security guard in the same company. Company B has been operating on the market for more than 30 years, has more than 180 employees, with security services client from both the public and private sectors, and operates exclusively in Slovenia.
- The third respondent (R3), who is a procurator of company C, has the sixth level of education, has been in a managerial position for 15 years,

and has previously performed various jobs in private security. Company C has recently undergone restructuring and has been in business for four years, operates in three different countries and employs 900 people, with security services clients from both the public and private sectors.

- Mr Branko Slak has been working in the field of private security for 12 years and has been the president of the Chamber for nine years.

All three companies included in the study employ all types of security personnel: security guards, guards, technical security guards, security operators, security managers and security supervisors. They provide all forms of security services, except protection of persons and design of technical security systems.

## 4 RESULTS

In the following, we present the findings of the study, which show the current challenges facing the Slovenian private security companies, their future development plans, and feasibility of advanced technological solutions, taking into account legislative frameworks and their effectiveness in solving human resources problems. The results are combined and presented in a summarised form by individual sections, as presented in the methodological section of the article.

The first section relates to human resources problems in Slovenian private security companies. Respondents confirmed that the lack of human resources is a significant problem. This is reflected mainly in the competition between private security companies and the inability to provide sufficient numbers of security guards for certain security orders. According to the respondents, the causes for the lack of human resources can be divided into internal and external. Internal causes are working hours, overtime, and low pay of security guards considering the complexity of work, while external causes are a lack of interest of young people in the work of security guards, young personnel leaving the industry, excessive additional training, and legal restrictions for immigrants to obtain service cards without the appropriate citizenship.

On the other hand, the president of the Chamber believes that the causes are primarily external and a consequence of the economic situation, as the shortage of personnel is noticeable in all industries, not only in private security companies. Respondents from private security companies believe that the human resources problem requires a multi-level approach. They primarily highlighted the problem of competition and inconsistent prices in the private security market, and the consequent provision of security services without any emphasis on quality. They note that private security services clients often do not have adequate knowledge of security services and do not realise that the quality of services also depends on the price. Because of these challenges, private security companies are unable to offer fair pay to security guards. Secondly, they also acknowledged the regulative challenges, specifically the legislative issues and inflexible employment procedures. Private security companies try to solve human resources problems by providing a positive working environment, effective internal communication, and assistance in solving employees' issues. In order to meet the quantitative

needs of security orders, private security companies attract new personnel through public networks and rely on indirect recruitment. Respondent R1 stated that they are affiliated with the Secondary School for Security Education and are actively cooperating with the Chamber for the Development of Slovenian Private Security. We asked the president of Chamber about how, if at all, private security companies strive to improve the social situation of security guards. The respondent believes that it is first necessary to sort out the relationship between private security companies and state bodies, finding ways to improve the private security market, which would, in turn, contribute to the growth of the minimum wage of security guards.

The following section covers the development of employees' competencies. Respondents consider education and training of employees to be important, and therefore actively participate in public tenders for additional education of security guards, projects organised by the Chamber for the Development of Slovenian Private Security, ASI – Comprehensive support for companies for active ageing of the workforce, and in English language school centres, in addition to the mandatory education and training required for the work of security guards. The president of the Chamber agrees on the importance of continuing education in employment, stating that the success of a private security company is contingent on qualified personnel that can offer quality security services. Given the exponential technological developments that also characterise the security sector, respondents R1 and R3 confirmed the planning for the development of new technical competencies in human resources over the next two years, while respondent R2 believes that they already provide employees with the training needed for technical security, so they do not plan to develop new technical competencies in the next two years.

The third section relates to advanced technological solutions. The respondents recognise the benefits of using advanced technological solutions and strive to implement existing security services. They believe that the main advantages of using modern technologies are related to lower demands for human resources, greater effectiveness in the provision of security, and overall improved surveillance capabilities. Furthermore, they represent a good complement to video surveillance and allow to exceed the limitations of traditional approaches to security, and at the same time represent a solution to the described human resources problems. Advanced modern technologies thus represent a good upgrade of security services; however, the respondents point out that the effectiveness of using advanced technologies is contingent on the appropriate integration of technology and human resources. They consider the digitisation of administrative procedures (reporting), which coincides with the GDPR, smart applications for communication between security guards and security control centres, task management, document sharing and tracking applications, modern video surveillance systems and modern anti-theft systems to be the most useful for their work. They also state that they plan to use new technological solutions in their work and provision of services in the next two years. In addition to the listed advanced technological solutions, respondents also recognise the effectiveness of security robots and drones. They believe a security robot is an effective example

for patrolling larger areas and critical infrastructures, while a drone is effective for surveillance of public gatherings. The president of the Chamber added that the combination of the two abovementioned security solutions would represent an even more effective security system. The respondents were also asked about the potential risks that may arise when using advanced technological solutions. They recognise excessive invasion of privacy and violation of human rights as the most important risks. They believe that preparation for their use is important, as legislation has not defined them yet (2020).

The fourth section relates to the adequacy of Slovenian legislation. The respondents from private security companies highlighted the challenges of Slovenian legislation, which are reflected in their work and the development of the private security industry. They believe that legislation (1) excessively interferes with staffing, thereby exacerbating the problem of inflexible employment; (2) does not include a collective agreement that could regulate employment in more detail; (3) excessively interferes with the economic activity. Respondent R2 believes that the state should regulate only the general regulations while leaving economic aspects and procedures to the private security market. He adds that by meeting the conditions set by the regulator, private security companies cannot adapt to the market, which in his opinion limits the development of the private security industry. Respondent R1 states that the regulator imposes requirements, guidelines and instructions for security services but does not provide relief for compliance. Respondent R1 explains the excessive interference in the company with the example of required equipment for the transport of cash – such equipment must be provided according to the prescribed standards, but they must procure it entirely themselves. Lastly, they add that (4) the regulator does not oversee unfair competition in the private security market and the grey economy. On the other hand, the president of the Chamber believes that Slovenian legislation on private security is flexible enough and allows for the possibility of development. However, it should be supplemented accordingly, thus eliminating the shortcomings manifesting in the professional field of private security.

The last section relates to future trends. The respondents from private security companies believe that the development of the Slovenian private security industry, compared to other countries, sufficiently follows current trends. However, they do not share opinions on the flexibility of companies. Two respondents (R2 and R3) from private security companies believe that companies are not flexible enough, as they are overburdened with meeting the requirements of the legislation. On the other hand, respondent R1 believes that the flexibility of private security companies is appropriate, as it is necessary for survival in the private security market. The president of the Chamber explained that the flexibility of private security companies depends on the client's demands. The more demanding the client, the more private security companies will strive to meet their demands, as this is how they get business. If the clients do not have the appropriate knowledge of security services, the private security company will provide only basic security. The respondents from private security companies believe that future challenges will be primarily related to meeting the growing market demands for the provision of security in general, growing complexity of

managing private security tasks, providing appropriate security personnel and appropriate training, continuous upgrading of security services by implementing advanced technological solutions, and strengthening information security. The president of the Chamber anticipates that in the future, the challenges will be related to meeting the legal restrictions set by the regulator, clients' demands, technological development and the consequent training of security personnel. He believes that private security companies will strive to replace physical security by using advanced technological solutions in conjunction with human resources, which could be offered as value-added security on the market.

## 5 DISCUSSION

The results of the conducted interviews indicate that the human resources problem represents a great challenge to Slovenian private security companies and that a multi-level approach to the solution is necessary. During times of a stable economy, when there is a high demand for skilled security personnel, young people opt for other industries or leave the private security industry in a few years, leaving behind an increasingly ageing workforce that is less adaptable to new technologies. In addition, the decision to look for another job is also influenced by unfavourable working hours, overtime and below-average salaries of security guards considering the complexity of their work.

In order to solve the human resources problem, a stable private security market is needed, which properly regulates the system of employees' salaries. According to the study's findings, one of the most important solutions is to ascribe greater value to security services and consequent improvement of the pricing policy, which will enable companies to provide higher salaries to employees (Savski, 2013). Low salaries of employees with unfavourable working conditions increase their dissatisfaction, leading to other forms of human resources problems. Therefore, it is important to make clients, especially from the public sector, aware of the need to change their attitude towards the quality of private security and pricing of services. This means that clients should choose providers based on their references and strive for high-quality services rather than the lowest price offer (Celestina, 2013). After all, private security companies that adopt advanced technological solutions will offer such services at a higher price. This raises the question of whether clients will favour such developments and whether they will be willing to accept pricing policy changes (Marriott, 2020).

Based on the survey results, we found that according to the respondents' experience Slovenian legislation, which regulates private security, over-excessively interferes with said activity, especially in the area of human resources. Therefore, they propose a change in legislation that would positively impact employee recruitment. They view regulation of economic activity as a restriction of companies' flexibility and, consequently, their development. On the other hand, the president of the Chamber believes that the progression of private security activities requires more regulated mechanisms that will set proper guidelines for the safe usage of advanced technological solutions. The importance of legislation and regulation of technological development in security was also highlighted by

other respondents, who believe that the use of advanced technological solutions could excessively invade privacy and thus violate human rights. According to the respondents, the basic legislation in the field of private security is quite general in the part where it defines technical security systems and does not define aspects such as integration of information systems, digitalisation, advanced or smart technologies and applications. Quality implementation of private security activities requires well-organised mechanisms that would set guidelines for safe use for users of advanced technological solutions.

The study results also showed that Slovenian private security companies are aware of the importance of personnel education and training, so their employees regularly attend education and training courses. They also participate in public tenders for further training of security guards and work with secondary schools. Respondents also emphasised that technical skills and competencies will become increasingly important for working with advanced technologies.

By comparing traditional and modern approaches to security, we found that the use of advanced technological solutions could reduce human resources problems (for example, various solutions, including security robots and drones, can to some extent replace or facilitate traditional approaches to security, which in turn reduces the consumption of financial and human resources), but their use involves certain challenges related to their implementation in practice. Such challenges include: a) unexpected technical problems related to the use of advanced technological solutions, which in turn may pose a threat to residents; b) risks of misuse of personal data and excessive invasion of privacy; c) risks related to information and cybersecurity threats; d) changes in the required competencies of personnel and the set of education and training courses; and e) operating costs associated with the constant updating of systems, inspection and repair of technologies. In discussing the advantages and benefits of modern approaches to security provision, it is important to acknowledge that advanced technological solutions require constant human control (Sintal Koncern, 2017). These findings are also in line with the views of various authors, who agree that it is impossible to predict all possible events and that unexpected automation problems can lead to serious consequences in terms of safety (Hill, 2019). Nevertheless, modern technological solutions offer constant surveillance, filling the gap in traditional security and facilitating the work of security guards. The respondents also confirmed the effectiveness of solving human resources problems with the implementation of advanced technological solutions. The usefulness of advanced technological solutions is recognised mainly in the surveillance of larger areas and critical infrastructures. They also see the advantages of using advanced technologies in a smaller share of staff needed to perform tasks, greater security efficiency and tighter surveillance at night. Digital incident reports, smart applications for security guards, modern video surveillance systems and modern anti-burglary systems were emphasised as the most effective solutions that are currently most needed. Security robots and unmanned aerial vehicles are not yet included in the priorities, and even in such technologies, they recognise the usefulness for security activities. We can conclude that companies have needs for modernisation and digitisation of existing systems. In this respect, the respondents

emphasised that appropriate integration of technology and the human factor is needed to achieve higher quality.

In summary, the study results indicate that Slovenian private security companies are affected by numerous challenges, with technological advances and human resources problems being one of the most significant. Among others, pricing policy on the private security market was also highlighted as an important issue, since it hinders the development of private security companies and negatively affects their business success. At the same time, certain shortcomings of Slovenian legislation have been observed, especially in personnel recruitment. According to the respondents, the current legal regulation affects the flexibility of companies by excessive interference in their economic activity. Therefore, it seems that more efficient execution or implementation of advanced technological solutions in practice first requires the formation of strong foundations, which include efforts to achieve a stable private security market, improvements to working conditions for employees, and creation of regulation that will address management of security risks of advanced technological solutions.

Overall, we can deduce that if companies want to adapt to technological progress and respond appropriately to the challenges presented, they will have to upgrade traditional safety and work organisation approaches and resort to modern methods. Such changes depend not only on changes in legislation but also on internal measures in companies. Therefore, the management of private security companies is recommended to assess the quality of their security services and identify opportunities for improvement. It is also important that they strive to promote the motivation and commitment of employees and, accordingly, provide a positive organisational climate, a stronger organisational culture and offer existing staff an appropriate working environment.

## **5.1 Implications, limitations and future work**

The theoretical contribution of the presented research is wide, as no in-depth research has been conducted on human resources issues and technological development in the Slovenian private security industry. Accordingly, qualitative research was conducted, which enabled an in-depth insight into the situation in practice, and the findings can be used to plan future research. Most of the literature on the topic of advanced technological solutions in security is in the form of expert discussions, so the article is generally a rare scientific contribution on the potential of advanced technological solutions in the private security industry. However, the main limitation of the research is related to sampling. As a research sample is not random and representative, special care in interpreting the results is needed.

The results are primarily helpful for private security companies. They represent the advantages and challenges of a modern approach to security and the circumstances that need to be considered when planning the implementation of advanced technological solutions in practice. The findings of the analysis of regulatory frameworks, which highlight the key challenges facing private security companies in practice, are also important for planning regulatory improvements in the future. The results are also intended for other stakeholders in private

security, especially in planning optimisation and development of activities in the future.

Based on the results of the research, certain aspects that would be worth exploring in the future have also emerged. Although we presented certain possibilities of technological development of private security activity, in order to develop comprehensive recommendations for the introduction of technological development in the private security industry in the future, it would be necessary to study good practices and analyse areas of protection in which it would make sense to implement advanced technological solutions. It would also be necessary to specify the types of technologies for each security service. In order to determine the cost-effectiveness of different approaches to security, it would be necessary to examine the solutions in more detail with appropriate financial benchmarking, as well as to make proposals for appropriate amendments to the legislation to address the identified challenges.

## 6 CONCLUSION

Technological development and innovations are important in the private security industry for several reasons, mainly because they contribute to greater competitiveness, reduction of human resources problems, and greater work quality and efficiency. Although technological development in the economy is inevitable, it is hampered in the private security industry by an unstable market and a lack of financial resources, the absence of regulation, and a lack of qualified security personnel. To ensure appropriate further development of the private security market, it is important to establish an adequate legal basis and political culture that will ascribe higher value to private security services and encourage clients to understand the importance of quality in providing security services. Based on the described technological changes, the development of the private security industry also requires proactive operation of private security companies. This means that companies should constantly monitor development trends, be familiar with the needs of their customers and the market in which they operate, and properly assess which solutions are most suitable for them. All of the above requires flexibility and innovation of companies and the ability to respond quickly to unexpected challenges. Considering the constant technological advances and current social trends, the demands for a safer environment and consequent demand for private security will increase in the future, resulting in the need for the private security industry to follow global trends if it wants to remain competitive. Since private security activity indirectly contributes to the common internal security and represents an important player in the system of plural policing, it is important that all key stakeholders are involved in the development of the field, including private security companies, legislators, clients and other entities associated with this economic activity.

## REFERENCES

- Adams, W. L. (13. 7. 2012). British military to fill embarrassing security gap at the London olympics. *Time*. <http://olympics.time.com/2012/07/13/british-military-to-fill-embarrassing-security-gap-at-the-london-olympics/>
- Bendis, M. (27. 9. 2016). *Can security technology replace guard force?* Facility Executive. <https://facilityexecutive.com/2016/09/can-security-technology-replace-guard-force/>
- Bughin, J., Hazan, E., Lund, S., Dahlstrom, P., Wiesinger, A., & Subramaniam, A. (23. 5. 2018). *Skill shift: Automation in the future of the workforce*. McKinsey & Company. <https://www.mckinsey.com/featured-insights/future-of-work/skill-shift-automation-and-the-future-of-the-workforce>
- Button, M., & Lalonde, M. (2014). *State regulation concerning civilian private security services in their contribution to crime prevention in community safety*. United Nations Office on Drugs and Crime. [https://www.unodc.org/documents/justice-and-prison-reform/Civilian\\_Private\\_Security\\_Services\\_Ebook.pdf](https://www.unodc.org/documents/justice-and-prison-reform/Civilian_Private_Security_Services_Ebook.pdf)
- Celestina, I. (2013). Spoznanja in izzivi na področju zasebnega varovanja v Republiki Sloveniji [Findings and challenges in the field of private security in the Republic of Slovenia]. In *Zasebno varovanje v luči uporabnikov zasebno varnostnih storitev: Zbornik prispevkov*, (pp. 13–20). Zbornica za razvoj slovenskega zasebnega varovanja.
- Cobbina, J., Nalla, M., & Bender, K. (2016). Security officers' attitudes towards training in their work environment. *Security Journal*, 29, 385–399. <https://doi.org/10.1057/sj.2013.34>
- Davis, R., & Pease, K. (2000). Crime, technology in the future. *Security Journal*, 13, 59–64. <https://doi.org/10.1057/palgrave.sj.8340050>
- El Dorado. (28. 2. 2017). *Relying on technology in the security industry*. El Dorado Insurance Agency, Inc. <https://www.eldoradoinsurance.com/security-industry-news/relying-on-technology-security-industry/>
- El Dorado. (28. 9. 2019). *Changing of the guards: How the private security industry is evolving*. El Dorado Insurance Agency, Inc. <https://www.eldoradoinsurance.com/el-dorado-news/changing-of-the-guards-how-the-private-security-industry-is-evolving/>
- Fenwick, M., Kaal, W. A., & Vermeulen, E. M. P. (2017). Regulation tomorrow: What happens when technology is faster than the law?. *American University Business Law Review*, 6(3), 16–23. <https://doi.org/10.2139/ssrn.2834531>
- Fiber SenSys. (2012). *Microwave perimeter security*. FiberSenSys.com <https://fibersensys.com/product-information/download-file?path=A+and+E+Documents%2FApplication+Notes+-+PDF%2FAN-SM-011+Microwave+Perimeter+Security+Application+Note+-+Rev+A.+6-12.pdf>
- G. C. (23. 4. 2013). *Večina varnostnikov prejema zgolj minimalne plače* [Most security guards on minimum salary]. MMC RTV SLO. <https://www.rtvlo.si/gospodarstvo/vecina-varnostnikov-prejema-zgolj-minimalne-place/307323>
- González, F. (14. 2. 2019). *A la baja empresas de seguridad privada por falta de personal*. El Sol de Salamanca. <http://www.elsoldesalamanca.com.mx/local/a-la-baja-empresas-de-seguridad-privada-por-falta-de-personal-3062159.html>
- Grabosky, P. (2007). Security in the 21st century. *Security Journal*, 20, 9–11. <http://>

- [doi.org/10.1057/palgrave.sj.8350036](https://doi.org/10.1057/palgrave.sj.8350036)
- Hikvision Digital Technology (HDT). (18. 3. 2022). *Top 8 trends for the security industry in 2022*. CISION PR newswire. <https://www.prnewswire.com/news-releases/top-8-trends-for-the-security-industry-in-2022-301461128.html>
- Hill, R. (20. 5. 2019). *What role do robots have as security guards?* Colocation America. <https://www.colocationamerica.com/blog/robot-security-guards>
- Joh, E. E. (2017). A certain dangerous engine: Private security robots, artificial intelligence, in deadly force. *UC Davis Literature Review*, 51(1), 569–587. <https://ssrn.com/abstract=3048394>
- Knightscope. (n. d.). *Knightscope credited for reducing crime*. <https://www.knightscope.com/crime>
- Kyodo. (19. 4. 2018). *Over 90% of security companies suffering staff shortages, police survey shows*. The Japan Times. <https://www.japantimes.co.jp/news/2018/04/19/national/90-security-companies-suffering-staff-shortages-police-survey-shows/#.XJ5Nz5hKjIV>
- Kyung-Hoon, K, Soonil, B., & Kwanghak, H. (2010). Intelligent surveillance in security robot systems. In *IEEE Workshop on Advanced Robotics in its Social Impacts*, (pp.70–73). IEEE. <https://ieeexplore.ieee.org/abstract/document/5679624>
- Leenes, R., Palmerini, E., Koops, B., Bertolini, I., Salvini, P., & Lucivero, R. (2017). Regulatory challenges of robotics: Some guidelines for addressing legal in ethical issues. *Law, Innovation in Technology*, 9(1), 1–44. <https://doi.org/10.1080/17579961.2017.1304921>
- Lim, S. L., & Nalla, M. K. (2014). Attitudes of private security officers in Singapore toward their work environment. *Journal of Applied Security Research*, 9(1), 41–56. <https://doi.org/10.1080/19361610.2014.851579>
- Lin, P., Bekey, G. A., & Abney, K. (2009). Robots in war: Issues of risk in ethics. In R. Capurro, M. Nagenborg & G. Tamburinni (Eds.), *Ethics and robotics*, (pp. 83–103). IOS Press.
- Ludwig, S. (9. 3. 2018). Drones: A security tool, threat and challenge. *Securitymagazine.com*. <https://www.securitymagazine.com/articles/88803-drones-a-security-tool-threat-and-challenge>
- Madakam, S., & Date, H. (2016). Security mechanisms for connectivity of smart devices in the internet of things. In Z. Mahmood (Ed.), *Connectivity frameworks for smart devices*. Springer. [https://doi.org/10.1007/978-3-319-33124-9\\_2](https://doi.org/10.1007/978-3-319-33124-9_2)
- Marriott, M. (14. 5. 2020). *How to reduce security guard expenditure despite the increasing labour: Property management in procurement*. Pegaxis.com. <https://www.pegaxis.com/blog/how-to-reduce-security-guard-expenditure-despite-the-increasing-labour-costs>
- Nalla, M. K., & Cobbina, J. E. (2017). Environmental factors in job satisfaction: The case of private security guards. *Security Journal*, 30, 215–226. <https://doi.org/10.1057/sj.2016.12>
- Papademetriou, T. (2016). European union. In *Regulation of drones*, (pp. 122-132). The Law Library of Congress, Global Legal Research Center. [https://irp.fas.org/congress/2016\\_rpt/lloc-drones.pdf](https://irp.fas.org/congress/2016_rpt/lloc-drones.pdf)
- Pavlic, V. (30. 4. 2016). *Private security companies in Croatia faced with lack of staff*.

- Totalcroatiannews.com. <https://www.total-croatia-news.com/business/11646-private-security-companies-in-croatia-faced-with-lack-of-staff>
- Pavšič, G. (23. 6. 2014). *Varnostne službe v Sloveniji z dobički, za varnostnike slaba plača* [Security services in Slovenia with profits, security guards on low salaries]. Siol.net. <https://siol.net/novice/slovenija/varnostne-sluzbe-v-sloveniji-z-dobicki-za-varnostnike-slaba-placa-111822>
- Pfeiffer, S. (2016). Robots, industry 4.0 in humans, or why assembly work is more than routine work. *Societies*, 6(2), 1–26. <http://dx.doi.org/10.3390/soc6020016>
- Pistorius, C. (2018). *The impact of emerging technologies on the private security industry*. Delta Hedron. <https://deltahedron.co.uk/the-impact-of-emerging-technologies-on-the-private-security-industry/>
- Protect. (20. 5. 2020). *Sodobne varnostne rešitve* [Modern security solutions]. PROTECT – Infra varnostni inženiring. <https://www.protect.si/za-vas-posel/sodobne-varnostne-resitve/>
- Radonjič, G. (2013). *Tehnološki sistemi in integrirano varstvo okolja* [Technological systems and integrated environmental protection]. Ekonomsko-poslovna fakulteta.
- Ridenhour, J. (18. 3. 2022). *New technology in the security industry 2022*. Dsisecurity.com. <https://www.dsisecurity.com/2022/01/13/new-technology-in-the-security-industry-2022/>
- Savski, S. (2013). Izbira ponudnika zasebnega varovanja v javnem sektorju – Kaj lahko za izboljšanje stanja storijo izvajalci? [Selection of private security provider in the public sector – What can providers do to improve the situation?] In *Zasebno varovanje v luči uporabnikov zasebno varnostnih storitev: Zbornik prispevkov*, (pp. 38–43). Zbornica za razvoj slovenskega zasebnega varovanja.
- Servoz, M. (2019) *The future of work? Work of the future! On how artificial intelligence, robotics in automation are transforming jobs and the economy in Europe*. European Commission. [https://ec.europa.eu/epsc/sites/epsc/files/ai-report\\_online-version.pdf](https://ec.europa.eu/epsc/sites/epsc/files/ai-report_online-version.pdf)
- Sintal Konzern. (2017). Roboti v varovanju. *Sintalček*, 75, 6–10.
- SMP Robotics. (25. 7. 2019). *Security robots outdoor patrolling, video & thermal surveillance for security service companies*. SMP Robotics. [https://smprobotics.com/security\\_robot/](https://smprobotics.com/security_robot/)
- SSI Staff. (18. 12. 2018). *Experts share their top 5 challenges facing the security industry in 2019*. Security Sales & Integration. <https://www.securitysales.com/business/challenges-security-industry-2019/>
- Stinger Security. (12. 5. 2020). *Tehnično varovanje* [Technical security]. Stinger.si. <https://stinger.si/tehnico-varovanje>
- Sunstates Security. (12. 5. 2020). *How technology is transforming the security industry*. Sunstatesecurity.com. <https://www.sunstatesecurity.com/technology-transforming-security-industry/>
- Theodoridis, T., & Huosheng, H. (2012). Toward intelligent security robots: A survey. *IEEE Transactions on Systems in Cybernetics*, 42(6), 1219–1230. <https://ieeexplore.ieee.org/document/6392475>
- Turner, B. (15. 12. 2015). *Drones for private security*. American Security Force. <https://>

- [www.americansecurityforce.com/drones-for-the-private-security](http://www.americansecurityforce.com/drones-for-the-private-security)  
Vincent, J. (26. 6. 2018). *This Japanese AI security camera shows the future of surveillance will be automated*. The Verge. <https://www.theverge.com/2018/6/26/17479068/ai-guardman-security-camera-shoplifter-japan-automated-surveillance>
- Yeboah-Ofori, A, & Brown, AD. (2020). Digital forensics investigation jurisprudence: Issues of admissibility of digital evidence. *Journal of Forensic Legal & Investigative Sciences*, 6. <http://dx.doi.org/10.24966/FLIS-733X/100045>
- Zakon o spremembah in dopolnitvah Zakona o preprečevanju omejevanja konkurence (ZPOMK-1G) [Act Amending the Prevention of Restriction of Competition Act]. (2017). *Uradni list RS*, (23/17).
- Zavod RS za zaposlovanje. (2019). Napovednik zaposlovanja 2019/II – Kaj delodajalci napovedujejo za slovenski trg dela za prvo polovico leta 2020? [Employment forecast 2019/II – What do employers predict for the slovenian labour market for the first half of 2020?]. [https://www.ess.gov.si/\\_files/12836/Porocilo\\_napovednik\\_zaposlovanja\\_2019\\_II.pdf](https://www.ess.gov.si/_files/12836/Porocilo_napovednik_zaposlovanja_2019_II.pdf)

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