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Trends in security technologies

Abstract. Modern safety technologies are constantly advancing safety and health at work. The article dealt with new trends in security technologies. Speed is required in many industries. It is also reflected in security technologies. Every newly created risk must be responded to quickly. The innovations on the side of ensuring security also correspond to this. This publication aims to analyze current new security technologies and the possibilities of their use in companies.

*Streszczenie. Nowoczesne technologie bezpieczeństwa stale podnoszą poziom bezpieczeństwa i higieny pracy. Artykuł dotyczył nowych trendów w technologiach bezpieczeństwa. Szybkość jest wymagana w wielu branżach. Znajduje to również odzwierciedlenie w technologiach bezpieczeństwa. Na każde nowo powstałe ryzyko należy szybko reagować. Odpowiadają temu również innowacje po stronie zapewnienia bezpieczeństwa. Celem publikacji jest analiza aktualnych nowych technologii bezpieczeństwa oraz możliwości ich wykorzystania w firmach. (**Trendy w technologiach bezpieczeństwa**)*

Keywords: PZTS, ESKV, MZS, camera systems
Słowa kluczowe: PZTS, ESKV, MZS, systemy kamer

Introduction

In general, security technologies can be considered the purposeful use of knowledge from various scientific disciplines. Therefore, it can be assumed that these technologies will develop not only based on internal impulses for the development of the sector but also on the based ones and new knowledge within scientific disciplines in which security technologies have the sources of their functional elements. Due to the strong vitalonnectedness between information and security technologies, the current development of the first-mentioned technologies mayected like thelikerelatthe like related.

In contemporary terms, the development of information and communication technologies can be seen as a clear focus on user comfort and more technological, as well as steps toward the practical use of computational models of cognitive functions, such as image analysis and recognition.

However, the principle of operation of hardware security technologies is realized with the help of physical or chemical phenomena. The development of technologies associated with some of the codes used, such as distance measurement, thermal radiation measurement, or mechanical resistance of the material, can therefore also be applied in the context of safety.

Further advances in all these scientific disciplines are thus stimulating the further development of security technologies. However, in addition to positive factors such as scientific development, new trends in security technologies may also be influenced by negative factors. i.e.ch, factors increase the need to use security technologies.

In the last few years, we have seen an increase in the frequency of several such phenomena, such as terrorism, war conflicts, and the global pandemic. This places higher demands on the increased frequency of use of existing one'sando requirements for integrating new technologies such as mass body temperature measurement devices.

Based on the aspects mentioned above, a search was done for some available modern elements of security technologies, which can be considered representative cases of the current development of security technologies.

Emergency alarm and security system – PZTS

PZTS = Emergency Alarm and Security System, formerly called Electronic Security Alarm (ESS). It protects people's property, health, and lives from intruders.

The control panel is an essential element of any system. The keyboard can be supplemented with a wireless keychain or a mobile application for greater comfort.

Internal detection is provided by motion sensors (PIR). This variant can be extended by magnetic contacts on windows and doors, a glass break detector, and, if necessary, outdoor perimeter motion detectors, perimeter cable, infrared barriers, etc.

It can also be supplemented with EPS elements (smoke and optical-smoke sensors), panic buttons (a mobile application or a keychain can also be used), flood detectors, a gas leak detector, etc.

Outdoor and indoor sirens provide an audible intrusion alert. These can be supplemented by visual warnings (beacons, lights).

JABLOTRON 100+ security system

The JABLOTRON 100+ alarm can be used to secure a company or a house and automate a home. Thanks to it, it is possible to control lighting, garage doors, or blinds. The control of this alarm itself is not complicated. [1]

The JABLOTRON alarm is controlled by two-button segments and is owned by traffic light logic. Two colors are superessential.

Red color - if the button is red, the alarm is locked. If it flashes red, it means it is noticed in progress or has occurred.

Green color - if the button is green, it means that the alarm in the given area is unlocked - off. If it flashes green, it indicates arrival at the secured building before opening.

The JABLOTRON 100+ alarm can be controlled using:[1]
- MyJABLOTRON application,
- System keyboards,
- Chip cards,
- Remote control.

The JABLOTRON 100+ security system can also be

It is controlled via commands for Siri. You can open the garage and start irrigation or heating.

Technical parameters of the JABLOTRON 100+ system: [1]
- Up to 50 bus zones,
- Up to 50 user codes,
- Up to 8 subsystems,
- Up to 32 programmable PG outputs,
- 20 mutually independent calendars,
- SMS and voice reports from the system,
- Security level: 2.

Fig.1. – Alarm JABLOTRON 100+ [1]

The price of the JABLOTRON 100+ system is around 730 Euros.

Yale

Yale expanded its brilliant home product offering in 2021:

- interior Wi-Fi camera Pan & Tilt,
- interior Full-HD Wi-Fi camera,
- exterior Wi-Fi camera Light & Siren,
- exterior Wi-Fi camera Pro.

Indoor Wi-Fi Cameras

Pan & Tilt Indoor Wi-Fi camera - movement of the lens on both vertical and horizontal axes, thus allowing control of a large area of the home. The intelligent "tracking" function will enable you to detect, track, and record movement automatically. It is possible to connect it to the siren and the Sync Alarm intelligent alarm systems. [2]

If something unusual happens inside the home, the Yale View app will alert the notification owner to check the situation through their phone remotely. If necessary, it can intervene remotely using the app with its voice. This feature is incredibly positive for people who own pets, which they can check or calm down at any time during their absence. [2]

Indoor camera Pan & Tilt: [2]

- video realizing Full HD 1080p,
- 16x zoom with digital zoom,
- visibility at a distance of 10 m in night mode,
- Privacy mode - after activation, the camera lens is mechanically covered.

The recommended retail price of the Pan & Tilt indoor Wi-Fi camera is 73 Euros.

The second novelty is a static Full-HD Wi-Fi camera: [2]

- HD 1080p video recording
- Automatic motion detection function,
- the built-in siren with a volume of 80 dB can be activated,
- The Yale View app allows you to live-see the tracked space.
- night vision function at a distance of up to 8 meters,
- the camera can also be placed on its stand or mounted on the wall.

The recommended retail price of the indoor Full-HD Wi-Fi camera is 57 Euros.

Exterior Wi-Fi Cameras

Yale offers a Wi-Fi camera with integrated light and a siren to check the entrance door. The second product novelty, the exterior Wi-Fi camera Pro, allows you to record all the people moving around the monitored object.

Entrance exterior Wi-Fi camera Light & Siren: [2]

- Black and decent white design,
- the function of starting a recording based on motion detection and the possibility of real-time communication with incoming people,

- built-in microphone and speaker - allows remote communication,
- Built-in LED spotlight with 160 lumens,
- siren - warning signal with a volume of 80 dB,
- reliably withstands wind and rain,
- Scans in HD 1080p
- Night mode allows visibility at a distance of 10 m.

The recommended retail price of the Light & Siren exterior Wi-Fi camera is 110 Euros.

The latest novelty from Yale is the external Wi-Fi camera Pro: [2]

- allows you to make video recordings in HD 1080p quality,
- night mode with a range of up to 30 m, in which the image remains clear regardless of the lack of light and weather conditions,
- recordings of activity in the camera's field of view can be stored on a micro SD card,
- the ability to set a specific sector around the house, which will be primarily focused,
- Control via the Yale View app, Amazon Alexa, or Google Assistant intelligent assistants.

The recommended retail price of the Wi-Fi Pro exterior camera is 160 Euros.

Axis Communications

AXIS has launched three dome-shaped cameras equipped with a deep learning unit. This unit allows applications based on artificial intelligence in end devices. The cameras come pre-installed with AXIS Object Analytics, ensuring reliable detection with fewer false positives. [3]

Fig. 2 - AXIS Communication Camera AXIS P3265-LVE [3]

Main features of the new models: [3]

- high image quality in 2 MPx resolution at 60 fps,
- Light finder 2.0, Forensic WDR, OptimizedIR,
- Zip stream supporting H.264 and H.265 codecs,
- Powerful analytics with deep learning,
- audio of the I/O port,
- Enhanced cybersecurity features,
- support for third-party applications.

Cameras from AXIS - P3265-V/-LV/-LVE are designed to quickly blend in with the environment and are vandalism resistant with IK10. The cameras offer high image quality with forensic details at 2 MP resolution, at speeds of up to 60 frames per second. They also have a varifocal lens with a field of view of 36 to 100°. The cameras feature Axis Lightfinder 2.0 and Axis Forensic WDR technologies, giving them actual color and fine detail even in harsh lighting conditions. [3]

The AX IS P3265-LV and AXIS P3265-LVE models, designed for outdoor use, are also equipped with Axis Optimized technology, which helps with surveillance in complete darkness when illumination adapts to exposure – reducing the risk of blurry scenes in approaching or nearby objects. [3]

Electronic access control systems

Electronic access control systems (ESKV) are essential in controlling access to a protected object or its premises based on clearly assigned access rights. They decide who, where, where, and when access will be allowed or denied.

Kerberos 3D VISION

Kerberos 3D scanner is designed for visual inspection of the vehicle chassis, which aims to record or prevent unauthorized entry of the vehicle into the guarded object. The system must be installed just behind the prison gate on the entrance and exit part of the premises or in the vehicle inspection basket. The device offers modern advanced technologies such as automatic comparison and evaluation of the image in high-resolution color design, memorization of the vehicle chassis itself, and detecting and recognizing vehicles by license plates. [4]

After the vehicle is swiped through the scanning unit, the scanner releases an actual 2D image and a spatial 3D image of the chassis within 10 seconds. At the same time, the TV camera identifies the license plate attached to the respective pole or building so that it can be recorded. Subsequently, the system operator on the monitor compares the newly taken images of the vehicle chassis with the photos stored in the database. The system automatically displays the differences in both pictures of the vehicle chassis. [4]

- Scans cars and trucks with a maximum load of up to 12 tons.
- The scanning time of one vehicle is about 10 sec.
- Passage frequency approx. 6 vehicles/min.
- The speed of the inspected vehicle shall not exceed 15 km/h.
- The minimum height of the vehicle shall be 100 mm.
- The maximum width of the vehicle shall be 2 500 mm.
- Reliable efficient operation in adverse weather conditions, including snow and rain.

The price of the scanner is around 65 000 Euros.

Fig. 3 – KERBEROS 3D [4]

Mechanical barrier systems

The Ministry of Health includes all mechanical elements complaining of the forced intrusion of an unauthorized person into a protected zone or object. Prevents unauthorized entry through fencing, door or window openings, and subsequent manipulation with protected objects in the secured thing.

Mechanical barrier systems protect with their strength. The time that an unauthorized person has to spend on overcoming the Ministry of Health is, in many cases, longer than is tolerable. The primary task of the MZS is to create an obstacle that discourages destructive disruption.

The aim is to:
- prevent the forced intrusion of an unauthorized person into the protected zone,
- prevent the deterioration of the equipment, as well as the equipment inside the protected zone,
- prevent the theft of objects and other values inside the protected zone,
- prevent the placement of a dangerous object in the territory of the protected area.

Security blind ALMMA SEJFALM RC2

These are safety blinds with certificates from the accredited Safe Test testing laboratory. They meet the conditions of safety class RC 2. They are suitable for securing shops, offices, and residential houses from burglary. [5]
- Protection of property,
- Protection against adverse influences,
- Energy saving
- Ease of maintenance,
- Reduction of outdoor noise,
- Privacy.

They withstand up to 300 kg of thrust from below. Due to the higher weight of the armor, it is possible to control them only by electric drive. [5]
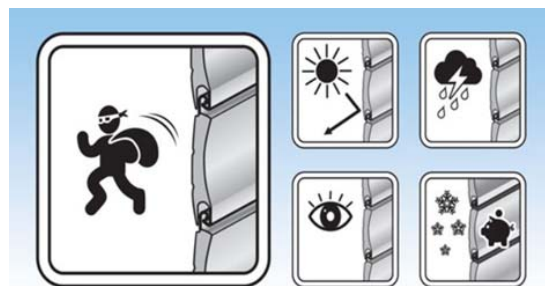

Fig. 4 – Function of the Alma roller shutter [5]

Conclusion

This study was broadly divided into categories related to PZTS, CCTV, EKVS, and MZS. Characteristic representatives in the given categories represent aspects of detectable individual trends in security technologies.

Within PZTS, we can observe a trend towards user comfort and increased accessibility of control, especially with the help of the Internet network and the principle of the "Internet of Things." In this spirit, the integration of mobile phones into the user interface of some security systems is also included.

Using clear physical principles for detection, some of the elements benefit from the direction of miniaturization and higher availability of sufficiently accurate sensors, such as the RESCAN detector, using LiDAR technology. Two main branches then monitor security technologies from the CCTV category.

The first, technological, aims at a higher use of functions for image recognition; it is automatic processing and evaluation, i.e., functions that allow, for example, the alarm to be sounded when a virtually determined guarded area is violated or the identification of the vehicle's license plate.

The second direction applied within the security technologies of camera systems can then be described as situational or reacting to the current situation. We are referring specifically to the Covid-19 pandemic. One of the demands placed on safety technologies is the possibility of mass measurement of the temperature of the human body with sufficient accuracy to determine a person with symptoms of fever. This phenomenon could not be fully

plausibly assumed and is not entirely in line with the overall development of security technology trends to date. Still, it cannot be ignored.

For EVKS access control systems, higher requirements are placed on the speed of control of one person. However, a sufficiently thorough inspection of multiple cars on one is almost impossible for vehicles, especially for high-importance objects such as critical infrastructure elements. However, we can now speed up the review of individual cars by integrating several subsystems into the overall system, such as the KERBEROS 3D system under discussion. The interaction of several sub-concepts (creation of a chassis scan, reading of the license plate) can significantly speed up such a process and, at the same time, record the entire inspection for additional evaluations. Mechanical barrier systems use higher quality and more robust materials for more substantial and durable structures than before. However, one of the current trends in materials engineering – 3D printing – has not yet found its application in security technologies. This is mainly due to the fragility of the materials used and the consequent insufficient strength of the products. Thus, not all available technologies can be used for security technology purposes. However, the course of their further development may also allow such applications.

We can anticipate the requirements of the security industry for the technologies used to some extent and try to respond in the long term to the criteria for speed, quality, and price of security measures. In part, however, we cannot assume these requirements. They depend on circumstances that cannot be easily influenced or considered, such as natural disasters, geopolitical conflicts or epidemics, and pandemics of diseases.

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