SMART HOUSE SECURITY RISKS WHEN USING A SMART LOCK

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Abstract. *The number of home and office invasions is constantly increasing. Its cause would not be the lack of safety of the locking mechanisms at the entrance doors, but the fact that the locks can be broken, regardless of their complexity. It is true that some can be unlocked in minutes, traditional padlocks that have been analysed in detail by villains, a few hours or more, namely electronic ones. This study will address the main qualities of an electronic home security system. When going through different scenarios, the most suitable intelligent lock shall be chosen.*
Keywords: *Smart padlock, Bluetooth, fingerprint, remote control.*

JEL CLASSIFICATION: O 3

INTRODUCTION

The development of information and communication technologies in recent decades has affected, in the best sense of the word, the way we work, communicate, learn and generally the way we lead our lives. It should be noted that any innovation that is implemented in a device brings with it some uncertainties about how it works.

Given the latest devastating natural phenomena (mostly floods and storms), the risk that the house will run out of electricity is increasing. If for a traditional home the power outage for a longer period of time would mean a simple impossibility to use electrical and electronic devices, which in the worst case would result in altered products in the refrigerator, then for a smart home, the consequences of the lack of electricity supply for a long time may consist in the exposure of home security to an increased risk through failure of the padlocks.

Therefore, any power outage for a smart home shall have minimal consequences for its proper operation. If earlier, not for a high-tech house, it was important that after a power failure, the devices remain functional when reconnected to the power supply, which was caused by a power outage, now it is vital that the devices have a good operation and their settings to be kept.

SHORT HISTORY

Before the appearance of padlocks, people protected their property in hidden rooms or in pools of water which in turn were guarded by armed guards or hungry predators. The padlocks have been implemented even before our era (BC). This invention has been attributed to many peoples, but its origin remains unknown today. Their appearance was conditioned by the need to prohibit the use of houses, theft from them or vandalism.

The oldest known prototype is a device similar to a wooden latch, dating from the 700s BC. It was recovered from the ruins of an Egyptian temple (Figure 1). In the Iron Age, the Romans took over this technology by replacing wood with metal parts [1].

Figure 1. Egyptian padlock
Source: https://www.historicallocks.com

The use of padlocks involves a certain level of responsibility, namely the loss of the key. In order to minimize the risk of losing the key, mechanical digital locks were invented, but even in this case the cipher may be forgotten and the padlock may remain locked.

SMART PADLOCKS
With the introduction of smart devices in the home control system, electronic locks have become the "key element". They provide extra comfort in use because they can be managed by different methods at the same time (Figure 2). Network-connected padlocks offer both security and flexibility, and their installation is becoming increasingly simple.

Figure 2. Modern smart padlock
Source: https://august.com

The basic criteria of a smart padlock:
- o fire protection;
- o drilling protection;
- o made of robust material;
- o the electronic key is used instead of the traditional one;
- o automatic locking and remote control;
- o voice control;
- o biometric identification;
- o locking mechanism - electromagnetic or electromechanical;

Incorporating all of the above criteria into a single device would generate increased complexity in construction and adjustment. Besides the fact that the installation process will be quite unfriendly, its price will be much higher than what we currently find on the market. However, the reliability of such a padlock will be significantly reduced. It is important to mention that for a smart padlock, the remote management of the access function is a priority, and the basis of its operation is a microcomputer. An absolute priority of a smart padlock is the ability to maintain the safety of property as well as the family.

SCOPE

An absolute priority of a smart padlock is the ability to maintain the safety of property as well as the family. Its key element is a perfect match between its scope and technological endowment. The main areas where these devices apply are:

o Dwellings (houses);
o Hotels;
o Commercial offices;
o Manufacturing sites;
o Research and development organizations;
o Academic campuses

Some of the best padlocks of 2021 are Augustin Wi-Fi Smart Lock, Xiaomi Mijia, OpenPath. In principle, they could cover the full spectrum of areas of use of smart locks.
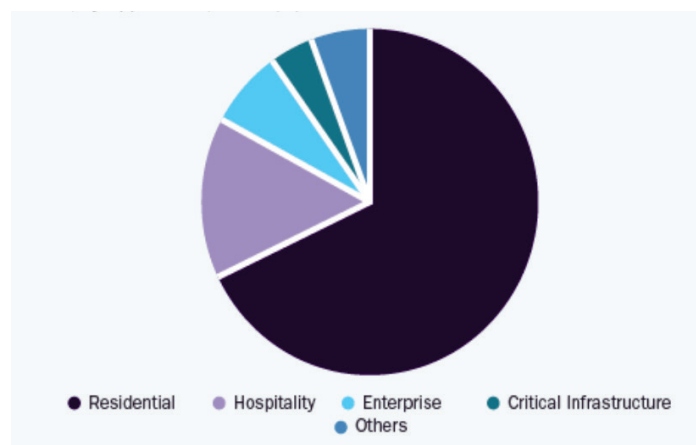
August Wi-Fi Smart Lock - makes entering and leaving the house much more comfortable, secure and smart. It is extremely easy to install, applying the device over the existing padlock cylinder. This is one of the most compact smart padlocks on the market. It is also equipped with a door sensor that informs each time if the door is closed and locked. An extremely useful advantage is the automatic locking when leaving the house and the automatic unlocking when returning. This is possible through the application installed on your phone. It is available on both iOS and Android phones. Also, through the application, messages are sent and received when certain family members have accessed the device [2].

Unlike the previous padlock, where the device is installed on an existing padlock, in the case of Xiaomi Mijia - the set contains all the necessary elements to secure the home. Its size is quite large. In addition to the technologies mentioned above, it is also equipped with a keypad, fingerprint reader - where the device has the ability to store the fingerprints of 50 users. This allows it to be installed in small businesses. In addition, NFC cards can be used. Here the danger of depletion of the power supply has been eliminated by adding an additional micro-usb port by which the device can be recharged or a safety opening can be performed [3].

OpenPath was created by a team of entrepreneurs who wanted to eliminate the situations in which they forgot the key at work, at home, or were frustrated to carry with them a lot of keys, even electronic, to access different rooms. Such situations endangered the security of the organization. In a company, smart locks have the function of both securing rooms and monitoring access to them, and managing it depending on the permission level of the key. Due to the large number of people, it is necessary to implement a variety of access keys, which would provide flexibility and convenience in the work of both employees and support staff [4].

MARKET TRENDS

Despite the difficulties of the pandemic year, the level of the market for this product has remained high. As we can see from the diagram (Figure 3), most of the marketing of this product belongs to the residential sector, which would be about one billion dollars [5]. Given the current trends, the Smart Home market will be constantly growing.

CONCLUSIONS

About 3 thousand years ago padlocks were implemented. The primary quality of this device has remained unchanged, being the security of homes or other rooms. The principle of operation has experienced dizzying development over the last century culminating in the increasing spread of smart padlocks.

Different types of devices have been adjusted to suit different usage situations. Here the scope of use, the number of users and the need for monitoring were taken into account.

The use of a smart padlock, in addition to increased security, shall bring extra comfort in the application of the latest technologies.

The market for this product is constantly growing. This trend has become even more pronounced in the last 2 years so that the turnover is about 1.4 billion dollars.

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