# IMPLEMENTATION OF CONTROLLING USING INTELLIGENT TECHNOLOGIES

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***Abstract:*** *The task of this article is to point out the implementation of smart technologies designed for controlling in selected cases. The aim is also to introduce the reader to this topic in order to get an idea of what this term smart technologies mean in controlling. The contribution of smart technology in controlling is currently crucial for many companies. Intelligent control means measuring a selected parameter, which can have a major impact on process accuracy, overall productivity and often results in significant reductions in operation and maintenance, as well as energy consumption. All these smart technologies make work easier not only for the controller, but also for the manager, by giving them access to new data that can influence the faster achievement of a set strategic goal.*

***Keywords:*** *intelligent operating systems, AI, systems, IDSS, decision – making, management, business, UAV*

***JEL Classification:*** *D8, L8, M15, M21,*

## 1. INTRODUCTION

The article focuses on smart technologies in controlling, which allow companies to use their resources more efficiently and anticipate possible problems. All these results are based on the company's recorded data. Based on this, we will focus on explaining these smart technologies in practice and how they affect the functioning of society. All these technologies can provide the company with authoritative starting points that will ensure the progress of the given processes in the company. In this work we will also present specific examples of smart technologies that have been implemented in companies.

The term controlling is derived from the English word "to control". However, it cannot be completely linked to control or management. In general, it has a meaning equivalent not only to our Slovak "control", but also to lead, direct, regulate, govern or administer. The task of controlling is to prepare information for solving planning, decision-making, implementation and control tasks. It cannot be confused with control or management, as its role is not only to assess events from the past, but, on the contrary, to anticipate risks and thus ensure the achievement of the company's goal.

Within the methodology, it was necessary to conduct a survey and analysis of specific Internet or book resources that serve as a supporting part of the work. All these sources were based on professional sources, which means that this is relevant and verified information. After studying the issue, the selection of the most suitable sources followed, which formed the main part of the work. The output is a theoretical and practical output from well-known experts in the field of controlling. As these technologies are new, it is more difficult to find a wealth of information that would tell about the results of smart technology in controlling. This area is constantly innovating in controlling and therefore new studies and documents with new knowledge from the given issue are being created. In the following work, some analytical methods were used, which provided us with a more efficient use of resources and thus gained a more objective view of the topic of smart technology in controlling. All these results lead to the final part of the work and to the discussion, which serves as an expression of the author's opinion on the topic.

## 2. INFLUENCE OF CONTROLLING IN SMART TECHNOLOGY

Process management plays an important role in how processes will work in a company during an emergency. Without adequate and reliable process controls, the unexpected occurrence of process problems cannot be monitored, controlled and eliminated. Process control can range from simple manual actions to computer logic control units remote from the desired point of operation with additional instrument feedback systems. These systems should be designed to minimize the need to activate secondary safety devices. [5]

The goal of process control is to keep key process operating parameters within a narrow range of the reference value or setpoint. Intelligent control is a place where processes can change the process control input parameter given to improve process operation. An example of intelligent control is where the feed position for the final size changes in response to a sensor measurement, such as a diameter indicator. Intelligent control means measuring a parameter and deriving the need to change another parameter. The size example is just simple. In practice, however, intelligent software can also have a major impact on the accuracy and productivity of devices in society. Process control consists of using the best available control techniques for machine control. [5]

The period of the last few years is characterized by the dynamic development of the use and introduction of information and communication technologies. The need to collect, sort and store data and information about processes in society is growing very fast. The competitive environment forces companies to make quick and efficient decisions on a daily basis. With the growing amount of data and

information, it is even more important to select and need to use relevant data to support corporate governance and coordination decisions. [12]

The use of advanced technologies to support management in many companies is a priority and one of the main steps and procedures for successful corporate governance in the implementation of projects. The interconnection of different technologies and systems and their multifunctionality avoid talking about this group of technologies only in the intervals of information systems. Information and communication technologies represent complex hardware, software and also include communication technologies that enable the processing of all relevant data. Information technology is widely understood and involves a number of technologies. Building business success depends on many factors. The level of management of all operations is reflected in the amount of realized costs and, ultimately, sales prices. One of the basic goals of any business is to make a profit. Strategic management identifies the future opportunities and risks of the direction of each company or enterprise. This is the basic function of strategic management, which is followed by other important tasks such as management and control of all implemented measures to meet the goals of corporate strategy. Involvement in this phase as well as operational management is necessary due to the need to recognize in a timely manner the deviations from the basic direction with correctly selected performance and operational tools. Strategic and operational management have jointly created two functional units, which on the one hand are interconnected and at the same time influence each other. [12]

The management process is focused on the operational result, which is implemented through planning, monitoring and verification. Controlling is based on the alignment of goals set by managers and employees with the goals set by the company. The main role of Controlling is to ensure the long-term survival of the company in the market and to create job stability for employees. These tasks require a coordination management system, which can be achieved by creating an appropriate organizational structure and integration objectives with information and planning systems. [12]

Controlling systems are information systems that perform functions performed by the controller in the company. They are supporting tools that automate planning, management and control activities, and in connection with control, it is important to plan costs for specific activities of the company. The process of managing the following activities:

- cost planning and economic feasibility of the project in the planning stage,
- monitoring and forecasting the efficiency and use of financial resources,
- proposal of measures to address development deviations (costs and time) in the implementation phase of the construction project,
- assessment of the actual effectiveness of the construction project in the implementation phase.

## 3. EXAMPLES OF SMART TECHNOLOGY

### SMART TECHNOLOGY DESIGNED FOR CONTROLLING IN BUILDINGS

Control systems are crucial for the operation of high-performance buildings. The building's intelligent controls provide advanced functions through a computer intelligent network of electronic devices designed to monitor and control mechanical, electrical, lighting and other systems in the building. Advanced technology enables the integration, automation and optimization of any building system to support equipment management and building operation and performance. [8]

An intelligent control system often brings a significant reduction in operation and maintenance, as well as energy consumption. Intelligent control systems can manage, monitor and optimize building services such as lighting, HVAC, electrical plugs, security, CCTV, access control, audiovisual systems and occupancy systems. Advanced building management platforms with customizable control panels, innovative software applications, open programming languages and advanced integration options are on the market. These integrated building management systems and intelligent controls are better suited to maintain building performance and more efficient process management. [1-4, 6-8]

### SMART TECHNOLOGY DESIGNED FOR SUPPLY CHAIN CONTROLLING

Smart technologies in the supply chain enable competitive advantage in the digital environment. In addition, the study examines how the digital transformation of companies can support smart technologies, leading to improved relationship performance. The results of a survey of 280 Finnish SMEs show that the digital transformation of companies alone cannot increase the performance of relationships and needs to be linked to smart technologies to achieve this goal. This means that intelligent technologies mediate the relationship between digital transformation and the performance of relationships in society. Smart technologies refer to entities in which physical devices or processes are complemented by the smart features of digital technologies. The presence of smart technologies therefore acts as a challenge for SMEs to achieve relationship performance through digital transformation. [1-4, 9]

The development of a management strategy for a technological process consists in formulating or identifying control objectives.

### SMART TECHNOLOGY DESIGNED FOR HOUSEHOLD CONTROLLING

The smart control method used in a smart home system to control the number of home appliances that can detect and act on a user's approach to a smart home. The smart home system learns user habits from repeated entries of the same user at repeated times to determine that the control command is a habit. When a user arrives at home or appears near a smart home, the smart home system invokes a control command to control that home device to perform certain operations. There is also a smart gateway and a smart home system. This system records all information that is used in the development of new products. [1-4, 11]

## SMART TECHNOLOGY INTENDED FOR INTELLIGENT MONITORING

Intelligent monitoring systems are used in intelligent networks to increase the reliability of components. One of the principles of operation of these systems is to assess the potential degree of exposure to failure of system components. For this reason, evaluating the possibility of failure and the origin of individual components is the right way to assess the state of the system, and a possible solution may be to evaluate processes for new components. These processes consist of the design, purchasing, installation and operation phases. This paper presents a new mathematical model for evaluating the reliability of distribution networks integrated into process-oriented intelligent monitoring systems. The model uses the Markov method and includes the influence of process failure factors on the overall reliability of the system. The proposed model is implemented in a real test system and investigated by simulations in order to study various aspects of the problem. The results show the significant advantages of the proposed model and reveal up to 90% improvement in system reliability after the use of intelligent monitoring systems. [5-6]

Monitoring systems are one of the main infrastructures in smart grids. They are an essential element in increasing performance efficiency, which is important for public services in all countries. Energy companies are looking for ways to increase the reliability and availability of real-time field data so they can make smarter energy distribution decisions. Incentives to move to electricity grid monitoring include aging infrastructure, increasing electricity demand and regulatory pressures that help analyze grid conditions. The modernized electrical system with intelligent technologies uses the monitoring of the intelligent network on individual components, such as transformers, lines and circuit breakers. To predict component failure, the intelligent monitoring system is one of the advanced technologies that can help with asset management. Therefore, this system can be used to model network reliability and identify performance improvements. [10]

## 4. CONCLUSION AND DISCUSSIONS

The contribution of smart technology in controlling is currently crucial for many companies. These technologies open up new possibilities for the controller to monitor the company's processes and how to use the information obtained effectively. Based on the available internet literature, we noticed the use of these technologies in practice, e.g. at the supply chain, smart homes or smart buildings. All of these examples have been evidence of how these technologies contribute to increasing process performance and how a potential problem can be predicted. The implementation of these technologies ensures simplicity as well as control over specific processes or components. Most of these smart technologies are connected through information systems that control and record all actions in the company.

As part of smart technology in controlling, it is possible for managers to obtain more information from the company's processes and thus more effectively manage the company's resources. Within such reports, managers are able to determine what are the appropriate options for solving a given situation and also know how to determine the most advantageous way of implementation. All these smart technologies make work easier not only for the controller, but also for the manager, by giving them access to new data that can influence the faster achievement of a set strategic goal.

Properly deployed controlling in the company creates an effective system of management and coordination of activities focused on achieving the set results. Properly functioning controlling in the company with the help of deployed tools identifies in time possible threats or influences that could prevent the company from achieving the set goals in the future.

The existence of controlling in the company means that systematic planning, effective control and continuous management of individual processes must be introduced in the company, so that the responsible employees can make better decisions and thus reduce the existing uncertainty. This requires a system of well-meaning information. It is essential to ensure that the data provided is as meaningful as possible. The result is then quality data for the right future decisions of the company's management. Controlling thus helps to discover the strengths and weaknesses and at the same time reveal the opportunities and threats that exist in society.

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