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Application of Automation Tasks and Management of Technological Processes

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Abstract

In the article, there is a scientific correction to the complexity of the automation of the production process construction of monolithic buildings and structures. Systems with a complex structure have their own characteristics with the interaction of the integrated system management systems for working methods and production process automation tools. The structure of local systems of MBS automation is justified Management of a complex management system in which construction processes and pages are interconnected. The optimal model the article examines the production of concrete with sliding thermoactive molds with hydraulic actuators. The model is combined with parameters of physical and mechanical processes. In response to these shortcomings, this work proposes Collaborative workshops and methods of identifying and integrating design automation tasks modeling of enterprise architecture for comprehensive analysis of design processes, including technological processes environments. The method applies design automation task templates that contextualize knowledge levels Design automation is necessary for defining the task and design process, including its technological environment. Evaluation with three industrial cases shows that the method allows efficient identification and integration Potential design automation tasks in a PLM context. Along with applying knowledge levels enterprise architecture modeling supports the identification and validation of relevant knowledge sources necessary to formalize the design automation task. Thus, this work contributes by introducing and evaluating a a new way to define a design automation task that brings modern design capabilities we can learn the results from the automation methods and processes according to the requirements arising from the design practice and related conclusions.

Keywords: Cast construction, production process, concrete mix, automation, control systems, optimization criteria, controller computer control system, information signals, control function.

Introduction

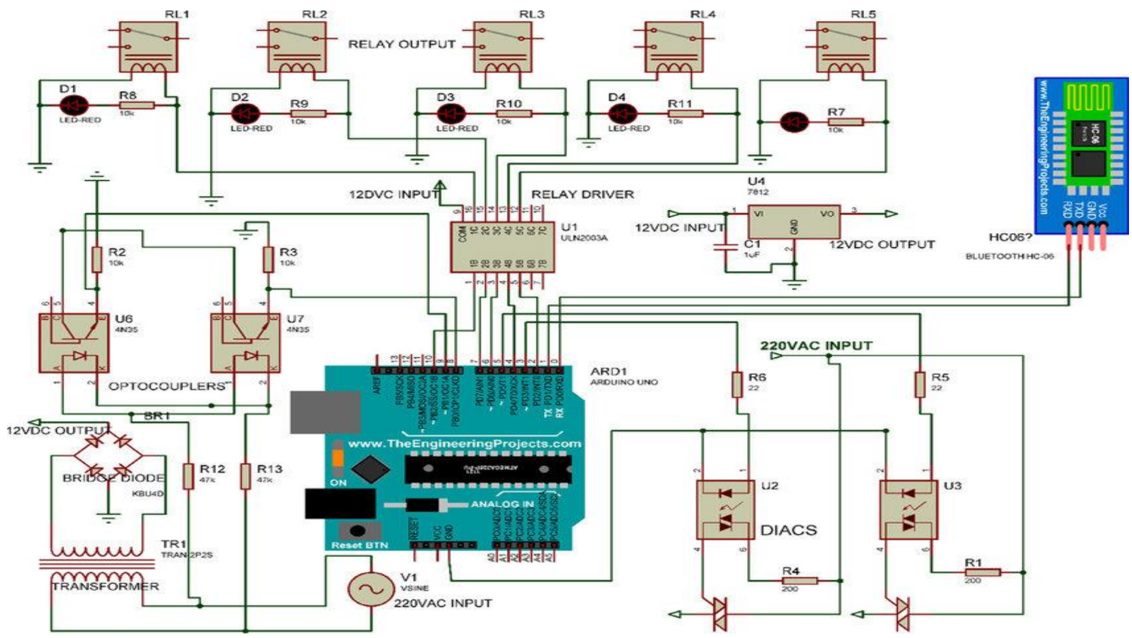
Monolithic construction of buildings and structures a promising direction of construction acceleration industry and its volumes, according to most experts, will be only will grow in the coming years. Increasing mass and height, changing configurations, etc as well as technological requirements to increase its strength creates the need to introduce new, more effective technologies for the construction of monolithic buildings and structures through the organic introduction of management systems based on modern technological automation of computing equipment and software plays an important role. Such a technological solution allows to achieve maximum speed production of concrete works, which leads to a reduction in MBS construction time. Concrete transportation and distribution efficiency alloy in the anti-thermoactive mold, compression and heating processes create and require implementation of new technological solutions the possibility of their automated management. Analysis of the technological processes of the monolith the construction shows that in the development of integration You need to start with the automation system characteristics of existing construction techniques and technological operations to build them: technological automation continuity, technical tools and solutions, it it is necessary to ensure the optimization of quality parameters of the process. In response to the deficiencies identified in the relevant work. This work considers the identification of the types of problems considered levels of knowledge required to identify and integrate design automation in industrial practice, taking into account different types design automation tasks and methods. It also includes detection with effective and efficient tools for analyzing design processes differ in their complexity.

Methods and processes

The automation system should reflect its integrated nature implies control in its structure and algorithms unification of operational management of a natural person from construction to technological process operations the whole structure. Such an integrated system must be able to control lover level units with individual local coordination paths subsystems. Local automation systems, that is, lower control unit's level, control the process itself in real time. At this level, individual sub-processes are optimized and progress operations are controlled. The proposed ideology defines general principles should be the basis for the formation of a certain automated the structure of the technological process for the construction of objects from monolithic reinforced concrete. Defines the set special requirements to be met by both technologist's process and related automation system. Determining the design automation task is central to the design automation project, including identification of applications and figuring out how to automate design in a given context integrating design automation from both technological and design process perspective. Based on this, there are two main disadvantages available methods to define a design automation task: First, The methods do not provide a means of identifying design automation tasks in the design process, which prevents a systematic examination of various design automation capabilities. Methods are limited to one unique technology of design automation, narrowing down the set opportunities to apply design automation in practice. Instead, the focus is on the methods available to define the design automation task knowledge acquisition and formalization techniques. By applying the proposed research methodology, a proposed method is developed based on the findings. Validated in a descriptive literature review and descriptive study the results are based on three industry scenarios:

- High performance and efficiency characteristics compared to the method comprehensive process analysis and identification, validation and Integrating potential design automation tasks in a PLM context.
- Use of collaborative workshops for design analysis processes is central to designers' understanding design process.
- The method bridges the gap between the technical aspects of design automation and design practices reflect the levels of knowledge designers need to define a design automation task, regardless of the specific method of design automation.

This feature allows them to be combined static optimization and automatic control tasks are resolved at different levels of the hierarchy. That is why, corrective control is applied at the end of each cycle; you can get complete information about process. Such a principle of real-time control can be only implemented in a multi-level hierarchical system, when continuous control process is conditionally divided discrete intervals with a given frequency of application of corrective actions. Optimization is done based on quantity sufficient information for quality description process. After determining the amount of information, it is enough to objectively evaluate the progress settings of local automation systems have been fixed. Marked the principles of systematization of the automated control system allow present a functional diagram in a three-level form (Picture 1).



Pictura 1. Functional diagram view of a three-dimensional automation system.

Results

Validation of the proposed method for identification and integration design automation tasks, a descriptive study was conducted using three industrial situations. Below, firstly, the research methodology used for the descriptive analysis is introduced, including description industrial cases and the rationale behind their selection circumstances. Next, set up a workshop for each industrial case and participants are explained. Finally, the results obtained from the application A proposed method for industrial situations is presented. This special issue focuses on research and case studies that show what automation looks like and robotics technologies and tools can be applied in the construction of buildings and infrastructure. Submitted papers identify one or more problems that could be addressed by automation, robotics, or advanced management techniques. used to provide innovative solutions. In this edition, many new studies and studies that seek to define milestones industry.

Conclusion

A proposed concept of automation in relation to TP monolithic industrial facilities are being built According to certain operational, technological, and information and technical content of the automated complex control system. Effective TP operation with complex subordinate units in the form of local control units are only possible with The support of complex automation that should provide a structural and functional relationship of elements. Concept using computer technology creation of technological process automation systems change, thereby determining the maximum integration technology, hardware and management modes. This allows high-speed implementation of real-time control algorithms level of complexity. It is not only the structure of the management system that is changing takes on the characteristics of multi-level and hierarchy, rather the nature of interaction of individual technological devices. The given theoretical foundations allow us to solve the relevant issues the problem of synthesizing consistent hierarchical (local) control Systems for continuous technological processes of construction, to ensure that it is carried out significantly new ways to improve the main indicators of construction industry. Automation task templates to test the required knowledge level to formalize the design automation task and integrate it into PLM. The validation of the method with three industrial cases from large enterprises highlights the effectiveness and efficiency of the method. In this context, comprehensive analysis and support of design processes tools and technologies using enterprise architecture modeling are shown to be important for identifying, validating and integrating potential Design automation tasks in a PLM context work too emphasizes the need to combine motivational aspects for evaluating design automation tasks, hence choosing a scope design automation. In this context, future work should be integrated methods for determining the potential impact of a design design performance automation and cost estimation respect for implementation. Finally, usability evaluation studies allows to draw a method in small and medium-sized enterprises conclusions on the application of the proposed method for design processes of a less regular nature than in large enterprises. O'telbayev Azizbek, a student of the Nukus Mining Institute at the Navoi State University of Mining and Technology, gave several examples of the processes of their application in mining and presented to international journals the methods of automation of mining technologies through microprocessors and the technologies in mining at the same time. Proved with several examples that it can be used in several technological processes. The use of modern technologies plays an important role in the development economy of the mine. It is necessary to pay attention to the parameters of technologies when automating processes in mining enterprises. Do not set the load beyond the limits of the technology, only then the technology will work for a long time without problems. In this article, I will inform you that if we install a microprocessor (automatic mode memory) in the technology in the mining enterprises, we will prevent the overloading of the technology. This ensures the operation of the enterprise and the safety of workers.

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