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PRODUCTION PLANNING IN TECHNOLOGICAL PROCESSES AND ROBOTIC PROCESS AUTOMATION PROGRAMS

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Abstract:

Production planning and planning activities in technological processes rely heavily on automation programs and it will be necessary to create opportunities to obtain timely information from various sources on the production and supply chain. Within the framework of this article, the current planning, planning and risk analysis in the field of production is carried out to explain to the public. In technological processes based on the existing problems and opportunities, the scheme of automation and robotization in the system is presented. Conceptual development a hybrid real-time decision support system model has been achieved and at the same time problem solving options were considered. The developed model incorporates advanced and intelligent planning and scheduling techniques and is implemented by a robotic process. Also advanced technology of application in automation technological processes was considered. Robotization predicts potential risks by using time in the process automation system and cost-oriented failure model and takes them into account during planning. The goal is to reduce the total average production time. The main task of technological automation is to improve production planning and scheduling in the field of production.

Keywords: Technological automation system, decision-making system, automation of robotic processes, continuous time, technological planning, automation operations in technological production.

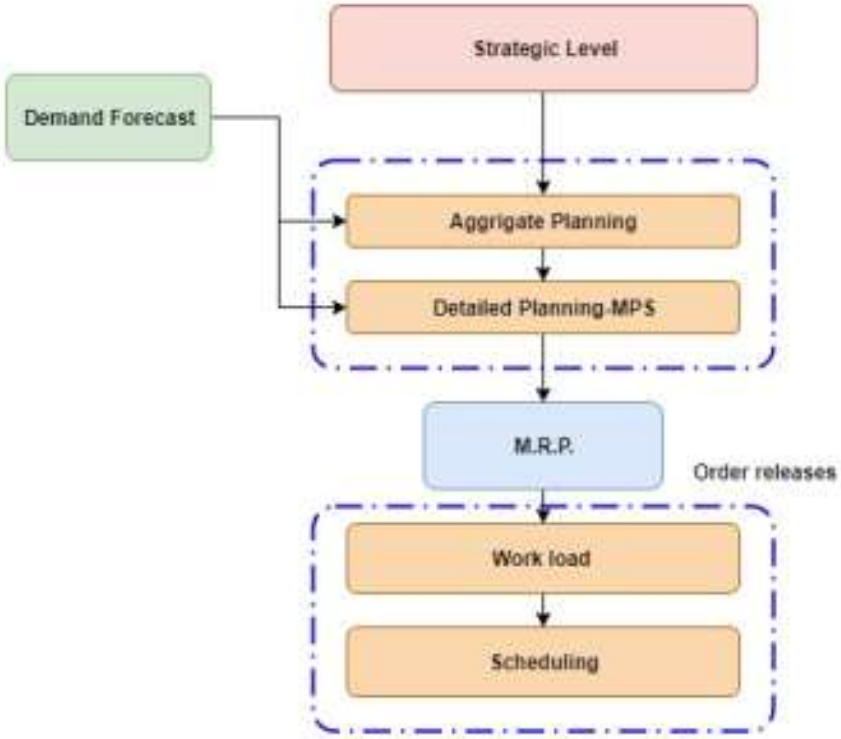
INTRODUCTION

The difference between the theoretical and practical reality of the management and planning of the technological process system planning system development in the real world is increasing. As they increase, the difference increases and mixed structures and other shortcomings in the industry will be eliminated. That's why most people newly developed technologies are being evaluated on a small scale and even only evaluated in the laboratory. Comprehensive production preparation requires raw materials, workstations, procedures, equipment, and specific storage. Automation system in technological processes the number of workers involved in the supply chain will be low. In the context of the manufacturing sector, training should also be included. Production in technological processes during the most reasonable and transparent production of products it is necessary to identify obstacles that may arise in the planning process, need to have the best tools for supply chain and order fulfillment on time. After the production planning, the production schedule which is the most is carried out and a difficult activity in any manufacturing sector, particularly one with a low volume mix, it is difficult because production planning requires a highly combinatorial and complex decision-making process. Effective production planning allows the use of personnel, equipment, machinery, etc. Accurate and fast added information is highly expected in the production schedule for management to make timely decisions, especially in the field of digital manufacturing. Industry 4.0 era settings, technologies for fixing multiple sensors in the production system is developing rapidly. Additional real-time output information is stored in the data and placed on the storage network. The question is how well this timely information is supported and customized production schedule for on-time delivery of high-quality goods and low cost of production is guaranteed. In the technological process automation system, the technology performs several processes at the same time. The definitions given above indicate two important elements (in addition to the aforementioned "Computer program in the control of technological processes"). First, will replace human labor with a robotization system." However, defining this concept as a "substitute software solution". Human labor is reduced in the implementation of technological production processes" - this is a very general definition; that is why, authors often use additional explanations to make it more detailed. Change doing a job done by a person or previously done by a person is the answer to many things and high level of generality and leaves a lot of room for guesswork. A more precise term mimic human behavior or map the steps taken to complete a given task covers the task. Expanding the definition to include such terms allows the user to imagine, explained how artificial intelligence should work much more easily. In describing the automation of robotic processes, terms related to the nature are less common and with

automation processes, it will be possible to describe the nature of the tasks performed within this technology. Among them, the technological automation system technology of robotization processes can be identified:

- ➔ Regular tasks - an example is production processes based on a technological system that are performed at a certain constant frequency. The more often the workflow is performed, the more inclined it is. It's about automation, which makes it a very good showcase and example on the basis of, from them it is possible to describe the technological automation system solution of robotization processes.
- ➔ Principle-based technological process — its implementation depends on clearly defined steps (paths) can be described by a closed procedure.
- ➔ Structured data - refers to the standardization of documents used in certain technological production and the process is performed on the basis of an automation system. It should be noted that processes that do not have the same data those whose structure or structure may change frequently are not recommended, because Due to the large number of exceptions, it creates a number of problems for automation, the capabilities of the technological system are limited.
- ➔ The technological system of periodic automation tasks — the term itself is not the performed tasks restores the connection of the technology of the technological system of the robotization processes with the systems with which it cooperates. This consists of interaction of intelligent automation class solution with client systems only when receiving visible data and processing them without requiring deep access performed in technological processes related to services.

Production planning in technological processes is a dynamic process that requires several interactions. Process automation system planning includes when to do and it does it in the mode of setting time, how much to do, where to do it, material needed and the necessary tools are selected. The overall efficiency of the production system depends on the effective preparation and design of the process at the stage of the technological flow, based on the conditions of the enterprise. There are three planning horizons, which are technological processes in production planning; strategic, intermediate and tactical, but these are two horizons supplier relationships need to be considered, covering two areas of interaction with cost and time markets. Considering Picture 1 below, the production planning of a technological system begins with a strategic one. Processes in stages at the level described and planning is usually driven by realistic demand or is brought to the level of expected demand. Strategic planning is divided from quantitative planning to incremental planning, and comprehensive planning can be obtained. Preparation of material specifications is the next step after thorough preparation. The final and difficult stage of the model is planning, which is the focus discussion point is considered. Processes should be implemented sequentially in the automation of production on the basis of the technological processes.



Picture 1. Approach to production planning in a simple technological automation system.

RESULTS

Answering the first research question (in this case, what internal conditions researchers to introduce automation system technology for robotization processes companies, causing their digital transformation), it can be concluded that and the first company (first case), the idea of automation mainly came from several fundamentals, determinants are different from each other. Among them, the following can be noted:

High complexity of technological system processes in production — this factor affected the time-consuming nature of specific tasks performed by employees. Along with growth difficulty of technological system process in production, more errors by operators appeared. Thanks to artificial intelligence, they could be destroyed. This according to its characteristics, there is no need to take time to make the right decision about the progress of a certain process and the ability to remember all the information related to the performance of a specific task. This is a very important business aspect often argued by companies to be more important financially as well.
Increasing the number of transactions - characterized by the development of the technological system of production. An increase in the number of enterprise customers affects the amount of time and employees need to perform specific tasks. Use of the technology of the automation system of robotization processes is a cheaper and simpler solution than hiring additional employees. The robot performs all the processes specified in the technological system and no extra training or work breaks needed.

CONCLUSIONS

Explore current technology automation process planning and risk analysis through this article production activities were carried out in order to clarify the problems and options available to the public were reviewed. Develop a solid conceptual a model of a hybrid real-time decision support system was described, including complex and intelligent planning and scheduling techniques and robotic process automation. The technological automation of the robotization process was implemented to solve the problems. The forecasts of the automation technology of the robotization processes are known potential risks by using a time- and cost-oriented failure model and takes them into account during preparation. The goal is to increase the total average production time by improving production planning and scheduling in technologically automated processes in the manufacturing sector. Qualitative data derived from a literature review from various academic sources (newspapers, journals). magazines, lectures, books and other online platforms) we draw conclusions along with intuitive thinking. Otelbayev Azizbek, a student of the Nukus Mining Institute at the Navoi State University of Mining and Technologies, is conducting research on technology automation processes. Azizbek is conducting research on robotics and automation technology of modern technological processes in mining enterprises. Azizbek's articles on technologies and technological processes in mining enterprises were published in international magazines. He is very interested in technological processes, currently studying computer systems management, applications used in mining enterprises. Azizbek is a 4th year student and has been following the processes in mining enterprises for a long time. He is interested in mining and loading processes, flotation and beneficiation processes, and the structure of metal melting furnaces in mining enterprises.

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