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MES SYSTEM FOR AIRBAGS: AN AUTOMATIVE MANAGABLE AIRBAG CONTROL SYSTEM

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Annotatsiya: ushbu maqolada Manufacturing Execution System (MES) tizimini ishlab chiqarish jarayonlarini rejalashtirishda, kuzatish va nazorat qilish uchun foydalaniladigan sanoat boshqaruvi dasturidi haqida yoritilgan. Bundan tashqari, ishlab chiqarish samaradorligini oshirish va mahsulot sifatini oshirish uchun avtomobil sanoatida qo'llaniladigan tizim hamdir.
Keywords: Ko'proq moslashuvchanlik, aqlli sanoq tizimi, zuqori kuzatuvchanlik, zavodda qog'ozni yo'q qilish, xarajatlarni tejash, doimiy takomillashtirish, butun zavodning global vizualizatsiyasi.
Аннотация: В этой статье рассматривается программное обеспечение для управления производством, используемое для планирования, мониторинга и контроля производственных процессов системы MES. Эта система также используется в автомобильной промышленности для повышения эффективности производства и качества продукции.
Ключевые слова: Большая гибкость, интеллектуальная система подсчета, лучшая отслеживаемость, отказ от бумаги на заводе, экономия средств, постоянное совершенствование, глобальная визуализация всего завода.
Annotation: This article discusses car airbags as a sustainable source of safety for today. It highlights the important role it plays in human life, including keeping people as healthy as possible in the event of a car accident, and also covers some of the issues associated with the introduction of airbags.
Keywords: More flexibility, High traceability, Paper disposal in the factory, Cost savings, Continuous improvement, Global visualization of the entire plant.

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Abstract. System MES in the automotive industry, the MES system is an industrial management software used to plan, monitor and control production processes. It is also used in the automotive industry to improve production efficiency and increase product quality. Currently, there are still many companies that do not have the benefits of having an MES system in place. In fact, there are many businesses that have an ERP and are not aware that they need more tools to improve their production. However, the industrial world is always looking for continuous improvement, pursuing operational excellence and optimization of costs and resources. This is why, in all sectors, it is becoming increasingly difficult to be competitive and to have a place in the market. This is why many companies start their digitalization process and therefore implement a tool that allows them to have full control of their production. This technological solution is the MES system.

Literature analysis. This literature review confirms prior work in the use of locomotive airbag technologies for vehicle or pedestrian collision mitigation, and to focus planned activities and tasks for this research. This report summarizes the state of the art in relevant technologies to assess the feasibility of this technology and identify critical model challenges for supporting impact simulations. The literature review did not reveal any currently deployed locomotive airbag solutions. In patent literature, external airbag technology has been described for crash mitigation between railcars and motor vehicles, but no meaningful analysis of feasibility has been discussed in detail in scientific or professional literature. Therefore, it appears that although crash mitigation technology using airbags in front of locomotives has been conceptualized, it has not yet been rigorously engineered or implemented

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1-picture. Manufacturing structure and performance in the automotive sector

Introduction: The entire production plant is connected due to Manufacturing Execution System. This makes it easier to obtain reliable information in real time. Thanks to the accuracy of this information, we eliminate the late implementation of corrective actions. In this way, we know the status of the equipment at all times and can detect faults and incidents in order to reduce them and speed up production

Global visualization of the entire plant: One of the most common problems in companies undergoing digitization is the decentralization of information, and the fragmentation of a system that is not able to unite all branches of the business into one. Taking your factory towards the Smart Industry means optimizing processes, obtaining a global and transparent vision of the production processes in order to be more efficient. All the data collected is centralized in a single platform and can be accessed quickly and intuitively, facilitating work between teams and departments. By having an MES system in place, we can identify both strengths and weaknesses and can establish a strategy for continuous production improvement. Also, through real-time and historical data, we can plan more effective actions.

Cost savings: By detecting errors or incidents early, the costs associated with them are minimized. In fact, by using equipment condition data, we can detect potential failures even before they occur, and carry out preventive maintenance when it makes sense to do so. Paper disposal in the factory, because the system provides an easy-to-understand, real-time representation of the data, it is very easy to access any point in production to find out what is happening at any given moment. Therefore, there is no need to carry around thousands of different pieces

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of paper that make work difficult for the operators. It also completely cuts down on unnecessary paper waste and hours spent on filling in documents.

2-picture: Air bag installation in the manufacturing

High traceability: In the automotive industry, processes are often complex and often involve multiple parts and components, which are involved in several of the processes. Keeping track of everything can be very complicated if we do not have a tool that allows us to have a high level of traceability in an automated way. The MES system can mark all raw materials and products with a unique code from the time they enter the plant until they leave. It is also able to organize these materials in batches and to know their position and status at all times. That way, if there is a part failure, it is very easy to locate it and take the necessary action to reduce the response time to this problem.

The main passive safety system to reduce injuries and deaths caused by accidents and transmitted acceleration to passengers is seatbelt. In this paper conceptual design of smart seatbelt developed. In this intelligent system, if the passengers do not fast the seatbelt properly, vehicle fuel and speed limited to decrease risk. For this purpose sensors installed on belt buckle and belt tension to send a signal to ECU to control vehicle speed and fuel rate if it is not fasten correctly. If passengers do not install the safety belt buckle or pull the seat belt is not enough, sensors send data to the ECU to reduce fuel injection to keep the vehicle speed under80 km/hrs.

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The company selected an MES software framework which supports modular adaptation to specific requirements. The functional and technical standardization requirements and the roll-out flexibility required by different plants and equipment could only be satisfied by a flexible and adaptable MES solution. In powertrain assembly, production orders coming from the ERP system must be enhanced with technical information to enable accurate production. The technical information consists of product specifications and specifications of the available line segments. This information is used to determine rules and structures for technical orders as well as line segments which are available for order processing. At execution time, the software computes the actual technical order based on the created rules and the production order. The technical order is loaded into the assembly station and stored on the respective unit (transmission, engine, axle, etc.) by the automation system. When a unit arrives at another assembly station, the station reads this information in order to execute the correct operation. At the same time, the MES collects the data in order to reproduce the processing steps. The production order status is fed back to the ERP system in real time.

In this type of system, the conventional spring element is retained, but the damper is replaced with a controllable damper. Whereas an active suspension system requires an external energy source to power an actuator that controls the vehicle, a semiactive system uses external power only to adjust the damping levels, and operate an embedded controller and a set of sensors. The controller determines the level of damping based on a control strategy, and automatically adjusts the damper to achieve that damping. Various suspension system performance and components are compared.

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Conclousion MES solution

The standalone solutions had to be replaced by an MES. The nature of the situation required a comprehensive MES instead of using dedicated MES tools. Only a comprehensive MES allows planning, monitoring, and ongoing analysis using dedicated indicators for the continuous improvement process (CIP) for the above value chain. Continuous analysis means that after the introduction of MES, every customer project is planned, coordinated, and evaluated using the now available tools. Interestingly, improving production efficiency and reducing costs were not primary objectives. Instead, the MES implementation had the two following main goals:

a) Replacement of the multitude of standalone IT solutions whose operation and maintenance resulted in numerous time-consuming and unmanageable activities. Over the course of several projects, the associated costs added up significantly.

b) Improving delivery integrity and avoiding penalties and additional costs (transportation logistics) by transparent and traceable project planning.

Additional standardization of data structures based on established corporate execution models and of transparent data transfer between applications will substantially advance innovation and deployment of MES applications in the Airbag system.

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