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   English: Smart Manufacturing Execution System for production in industry

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4. Background

Industry 4.0 involves the increasing number of worldwide executives, but it doesn't mean that they are all aware of the potential benefits of this trend for the companies. There are challenges that need to be tackled before the companies can transform into the next generation of industry.

The truth is many industry fields are still thinking that something will impact their shop floor in the future, but they don't know exactly when and what. There are many investments and pilot projects going on out there which are speeding up the process of refining the technology and preparing companies to improve their processes.

The range of potential applications is very wide and some trends have emerged where augmented reality has proven to increase process and people performances as well as being effective at driving down costs in so many departments.

Processes in the production environment exhibits a number of critical issues that make operations less efficient, as well as being more risky for technicians working in the field. Take for example, human errors, inefficient maintenance operations, costs due to longer operations, and waste in components due to incorrect procedure execution. This project will envision the future of industry standards to be one that operates with quiet efficiency, where all processes are performed and conducted seamlessly and smoothly.

5. Objectives
   - Help workers calculate the job priority for managing the process scheduling
   - Increase the degree of automation and digitization of production, manufacturing and industrial processes
   - Improve efficiency in the production and planning processes by managing the entire value chain process
   - Simulate the building blocks to virtualize the workflow and the statuses of jobs

6. Scope

   - This project will help Single Station Manufacturing (Type I) industries to plan and track the production workflow.

7. Expected Benefits

   - **Increased productivity:** Along with the increase in efficiency, improvements in productivity levels in the manufacturing sectors will also follow. Feasibility studies conducted in Germany showed that productivity in the manufacturing sector will increase by more than 60%. In fact, in the automotive industry, productivity is expected to increase by 10 to 20 percent once Industry 4.0 is fully implemented.

   - **Increased revenue:** Naturally, the manufacturing sector will also see an increase in its revenues. This project is seen as one of the major drivers for the growth of revenue levels, even as its implementation will also require significant investments by businesses. Cost-benefit analysis will demonstrate later on that revenue will increase faster and higher than the costs incurred to automate or digitize the manufacturing process.

   - **Increased employment opportunities and enhanced human and IT resources management:** As employment rate increases, the demand for skills, manpower and job opportunities, particularly in the fields of engineering will also rise. However, it will not be limited to the mechanical-engineering pool alone, since depending on the industry or manufacturing sector, any types of skills will be required.

   - **Optimization of manufacturing processes:** Having integrated IT systems within the production process will certainly make the most out of the resources at hand. Processes will be streamlined, and there will be increased collaboration amongst producers, suppliers, and other stakeholders along the value chain. The usual time that it takes to produce one unit will be visibly shortened since the process is simplified without compromising quality and decision-making is done in real-time. Similarly, business segments are allowed to develop with their full potential as they are individualized.

- **Development of exponential technologies:** This project will serve as an impetus or basis for further technologies to be developed. Suppliers and developers of manufacturing systems will use them as basis on what to develop next. For example, more companies are adapting the use of 3D printing technology. Already, developers are looking into technologies that will be an improvement to the current 3D printing technology.

- **Delivery of better customer service**: Traditionally, monitoring and feedback mechanisms are time consuming. With Industry 4.0 concepts and methods being applied, logistics and statistics will be generated and collected in an automated manner, resulting in faster response times. Businesses will immediately know whether or not an adjustment has to be made, what adjustments are required, and can respond faster to the needs of their customers.

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9. Equipment and Software Required (with estimated costs)

- N/A