Case Study

INDUSTRIAL ROBOTS IN AUTOMOTIVE INTELLIGENT MANUFACTURING PRODUCTION LINE - INDUSTRY 4.0

Keywords: *Robots, Automation, Intelligent Manufacturing*

Background to Case Study.

Many manufacturing organisations are seeking alternative methods of working more efficiently, with less resources, and increased repeatable results. The technical advantages of having automated systems are addressing several major divisions of labour, rendering an organisation more profitable and highly customisable.

Intelligent manufacturing production line for the automotive industry is support various streams of works, including but not limited to material mixing, car body painting, car body welding and vehicle assembly, especially in high end car manufacturers, where volumes are low but customer satisfaction is key, due to the high investment involved.

Introduction to the Case Study and it's growth within Industry 4.0

The Chinese automobile industry has in recent years grown significantly and development within this sector is undergoing rapid changes, to address the fierce market competition.

The automated welding of ladder frames from a KUKA production line have provided increased process stability. Given that the ladder frame provided the required stability to the vehicle body, the increased repeatable process provided increased assurance that the vehicle would be maneuvered safer over mud, gravel, and rough terrain, even due to its size.

These KUKA robot systems supported also the largely renowned Merdedes Benz products, however their adaptability to limited working spaces, enable their use also in smaller manufacturing companies.

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The Case Study and Industry 4.0 Elements: A Pictorial Overview
Automation supports personnel by taking over simple and repetitive movements/tasks which would alternatively utilise resources. As a result, personnel can focus more on value-adding tasks.

The use of Universal Robots within New Engineering Works allowed the SME to contribute more to value adding tasks rather the repetitive tasks which were by then taken over by the cobots which were implemented. This in turn supported New Engineering Works to meet their production demands.

Aside from the limitation presented by the space constraints and logistical requirements, the KUKA systems also enabled stable system and process control. This supports the human interface through the display of information about the machine status and simplifies operator control through the standardized functions.

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THE ELEMENT – AUTOMATION APPLICATION FOR INDUSTRY 4.0

The Element Explored within Industry 4.0 Application.  	The use of KUKA Robots within the automotive industry has supported the significant reduction of handling within the production facility. The use of such systems allowed for the organisation to be quick to react to any disruptive factors and address any human challenges to be swiftly addressed. The solutions address various requirements of the automotive industry including but not limited to the production, manufacturing, logistics through individual production and service concepts, adaptable to the organisation's requirements. In this way, the organisation can better utilise the human resource for higher skilled jobs, inspection and quality associated tasks, thereby increasing employee retention and knowledge adaptation. Despite the capital cost of the initial investment, the comparative cost analysis provides the reassurance of feasibility of its application. Having processes being executed in a more repeatable and stable manner in turn promotes more effective planning and adherence to committed timelines.
Application Target Audience	*The results of the case-study are intended for use by SMEs and entrepreneur subjects.*
Resources Used:	*Case Study implementation available here* https://www.kuka.com/en-gb/industries/solutions-database/2019/02/magna-welding-ladder-frames

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Further Reading:	Applied_Research_of_Industrial_Robots_in_Automotiv.pdf

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