International Journal of Engineering Sciences & Emerging Technologies, May 2024.
ISSN: 22316604 Volume 11, Issue 3, pp: 680-683 ©IJESET

A REVIEW PAPER ON PROS. AND CONS. OF INDUSTRIAL AUTOMATION

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ABSTRACT

This paper basically discusses the pros and cons of industrial automation in Indian industry involving machinery, processes in factories, boilers, heat treating ovens, switching in telephone networks, steering and stabilization of ships, aircraft and other applications with minimal or reduced human intervention. Wireless communication and smart sensors are used for improving automation technology. A case study of Tata Nano car has also been discussed based on the theme of the paper.

KEYWORDS

Industrial, automation, scenario, advantages, automobile.

1. INTRODUCTION

Industrial automation refers to the use of intelligent machines and programmable logics to several industrial processes.

The automation improves the efficiency and quality of the output and maintains consistency. In the modern era we use the artificial intelligence (AI) and internet of things (IOT). AI is all about to mimic human behavior. The internet of things uses smart sensors. The IOT is basically used for home automation and it helps people to live and work smarter. Industrial automation has several advantages and disadvantages as far as Indian scenario is considered [1].

2. Advantages of Industrial automation

2.1 Decrease the delay in supply

With the help of machines, work is done in less time in comparison to human beings .As the production increases,the companies are able to fulfill maximum consumer orders [3].

2.2 Reduction in gap between demand and supply

Machines help us to work with more accuracy and hence production can be increased. As the production increases thesupply of product will also increase.

2.3 Reduced Labour Cost

Machines can work for 24 hours in a day but human can't and a machine is capable to do work of many humans at asingle time. Hence labour cost can be reduced.

2.4. Offset labour Shortage

When labor is replaced by machines, use of labour can be reduced to some extent, particularly in the areas wherethere is shortage of labour.

3. Disadvantages of Industrial automation

Though there are many advantages of Industrial Automation but some of its disadvantages can be:

3.1.Capital Investment is very high

Heavy machines require high investment to design, fabricate and install for the production. These machinesrequire time to time upgradation and maintenance.

3.2.Increases the Unemployment

As the machines are used for production in place of labour , this may cause unemployment.

3.3.Designing Issues

At the time of designing, some issues occur and to resolve such issues we need knowledgeable and highly skilledworkers because they know about the trending technology.

3.4 Increment in Pollution

Most of the machines are operated through motors ,which generally use petroleum or gases and result in generationof poisonous gases and can harm the environment.

4. Example of furniture industry

In earlier times, for designing the furniture, generally hand tools were used to make the furniture of wood *(Figure 1).*In that case more labour and time was required for completion of work and more hard work was needed which resulted in delay in supply of furniture .Due to the human error and lack of modern equipment they were generally not able to fulfil the requirements of the people.

Figure 1: Furniture manufacturing by hand

But in the present time the labour does not face those issues. In the current scenario the labour has sufficientequipment and tools to design the furniture and make them attractive.

Automation in furniture industry reduces the labour cost and time. With the help of latest technology, simple furniture are getting smart and attractive. By the use of latest technology

(machines and robot arms as shown in figure 2)we can make furniture which occupies less space and is also good looking such as folding beds etc [2].

Figure 2: Furniture manufacturing in industries

5. Case Study of Tata nano

The Tata Nano is one of the Ratan Tata's Visionary Project (Figure 3). The Tata Motors was supposed to establish afactory at Singur in West Bengal, which was a takeover of 997 acres (4.03km square) of farm land .The aim of TataMotors was to provide 20,000 jobs directly or indirectly to the people of West Bengal ,using the business friendly policies of West Bengal . West Bengal is one of the most populated state in India.

Figure 3: TATA NANO

6. Failure of Tata Nano

Following points throw some light on failure of Tata Nano project

- The Tata Motors couldn't reach out to its target market because the dealer network was situated only in urbanareas. The market was situated in towns and villages.
- The project faced an eighteen months delay and was shifted from Singur, West Bengal to Sanad ,Gujarat (Figure4).
- Tata Nano was one of the cheapest car in the world.This strategy didn't work in favour of Nano and it wasnamed as cheapest one.
- The starting price of the Nano car was 1 lakh, which increased gradually with time for higher models.
- The Nano cars had poor riding comfort and issues due to light weight.

Figure 4: Tata Nano Plant in Gujrat

7. Conclusion

For economic growth and development, it is essential to adopt industrial automation. It also provides economic solutions right from the field of agriculture to spacecrafts. Industries are highly benefitted by automation and henceindustrial automation finds more acceptance from industries due to increased productivity and enhanced quality features. But, in a country like India, which is highly populated and a developing country, it is also essential that government should introduce more employment schemes and should start promoting Startups by making Startup policies more liberal and thus unemployment problem may be reduced to some extent and moreover these self employed people can create employment opportunities for others as well.

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