

Industrial Automation

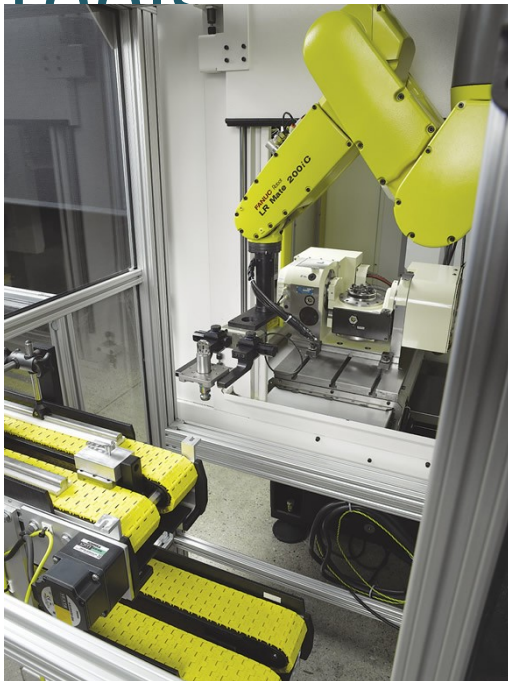
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Automation

- Automation is a set of technologies that results in operation of machines and systems without significant human intervention.
- It is derived from the Greek words 'auto'(self) and 'matos'(moving).
- Automation therefore is a mechanism for systems which 'move by themselves'.

Examples of automated systems

- Automated machine tools



- Industrial



- Automated storage systems



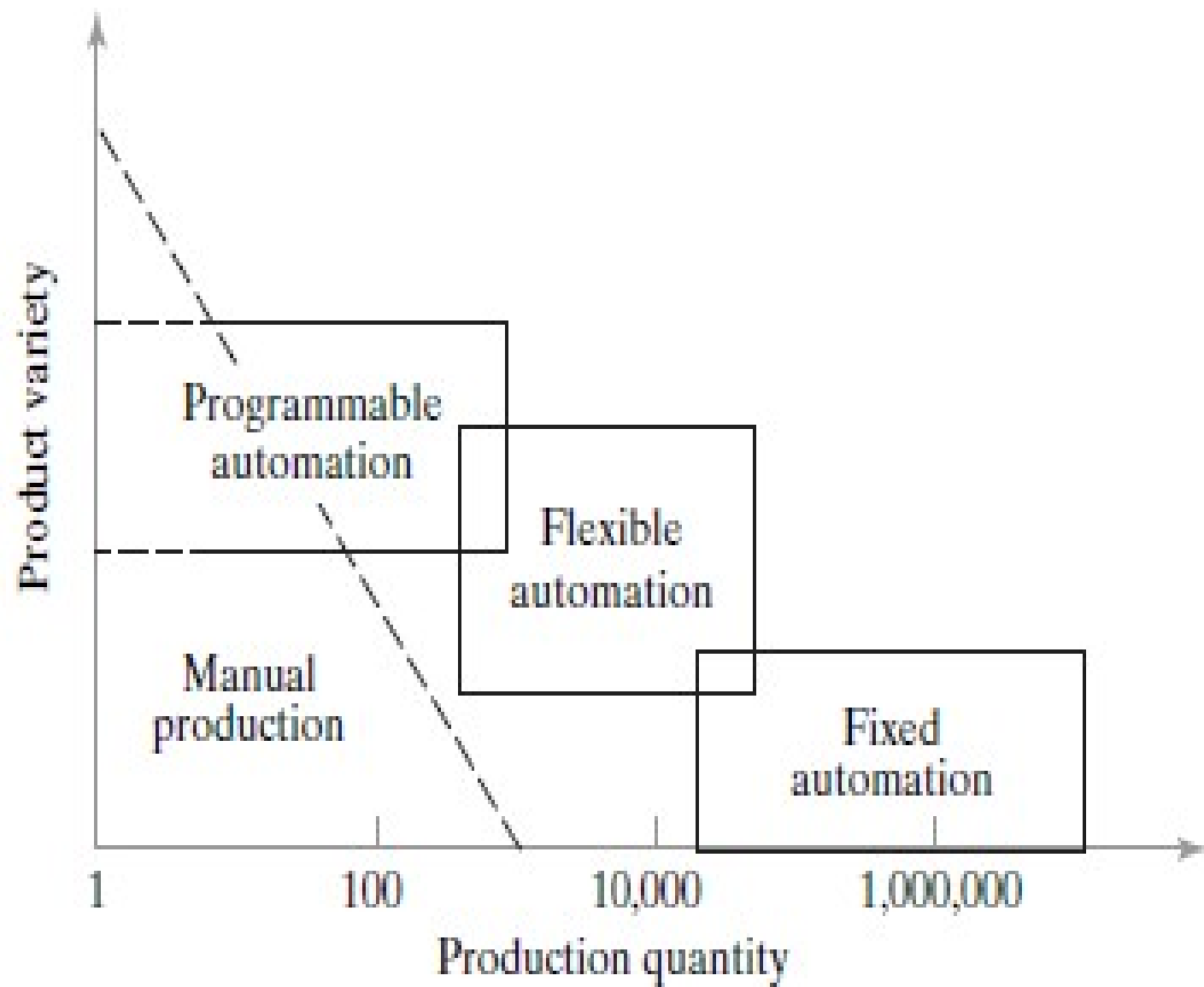
Industrial Automation

➤ Industrial automation can be defined as industrial process such as manufacturing, processing, etc by using automated systems rather than manual operations.



Types of Industrial Automation

- *Fixed Automation* - Used for high volume and discrete mass production.
- *Programmable Automation* - Used for changeable sequence operation
- *Flexible Automation* - Used for batch process where product variety is high and volume is low
- *Integrated Automation* - Used for integration of business systems using IT and communications.



Industrial Automation Tools

- Relay System and contactor logic
- Programmable Logic controller(PLC)
- Supervisory Control And Data Acquisition(SCADA)
- Distributed Control System(DCS)

Why Industrial Automation ?

- ✓ To increase labour productivity & reduce labour cost.
- ✓ To eliminate or reduce routine manual and clerical tasks.
- ✓ To improve product quality.
- ✓ To avoid high costs of manufacturing process and to increase overall production.
- ✓ To perform the operations which are hazardous for humans and improve worker safety.

Relative strengths of humans and machines

Human

- Sense unexpected stimuli
- Develop new solutions to problems
- Cope up with abstract problems
- Adapt to change
- Generalize from observations
- Learn from experience
- Make difficult decisions based on incomplete data

Machine

- Perform repetitive tasks consistently
- Store large amounts of data
- Retrieve data from memory reliably
- Perform multiple tasks at same time
- Apply high forces and power
- Perform simple computations quickly
- Make routine decisions quickly

Applications

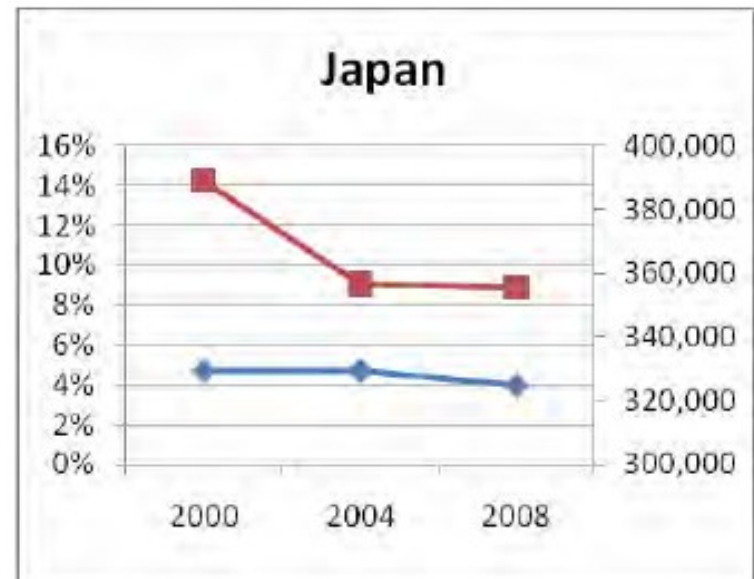
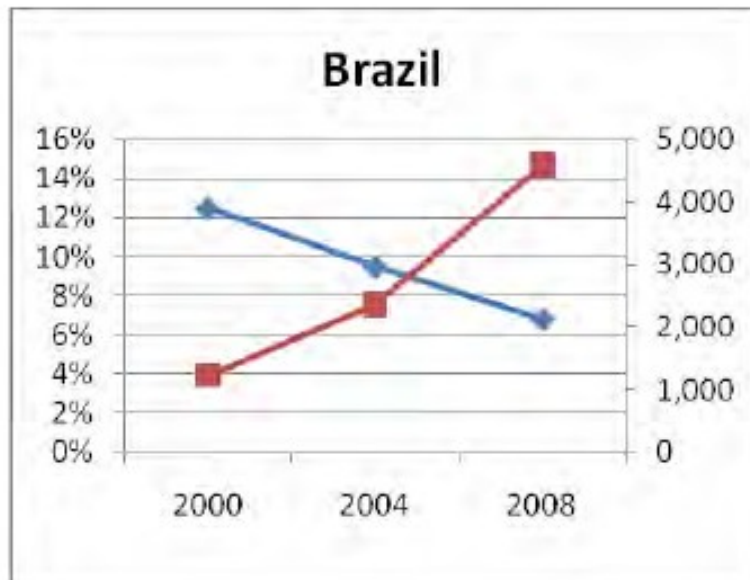
- Automated welding robots for cars
- Automated PCB assembly machines
- Distributed control systems for petroleum refineries
- Mission critical automation system in nuclear power plant
- Manufacture and assembly of products in day to day life,etc



We would like to raise a question for you all. What does your logic says whether industrial automation will increase or decrease unemployment?

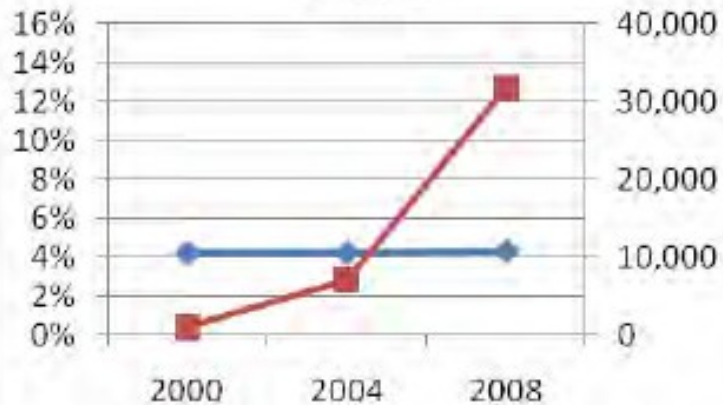
Positive Impact of Industrial Robots on employment

- Rate of unemployment trend vs number of robots used according to a recent study carried out by METRA-MARTECH

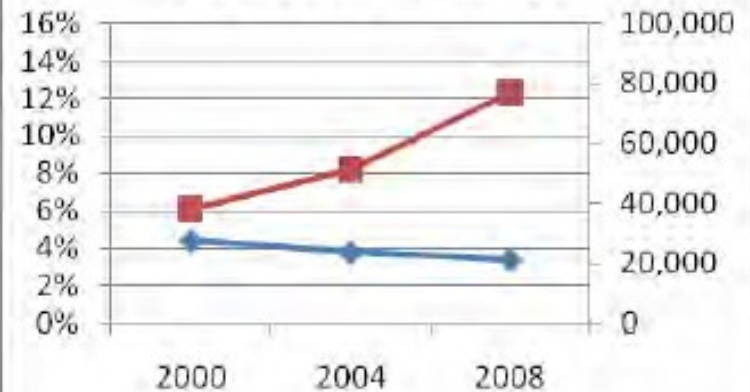


■ - No. of Robots
◆ - Unemployment %

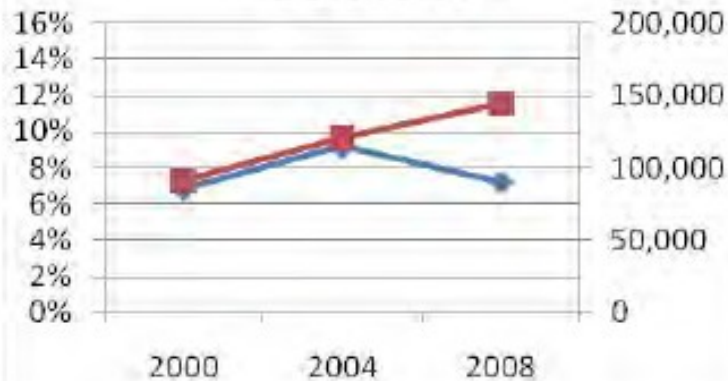
China



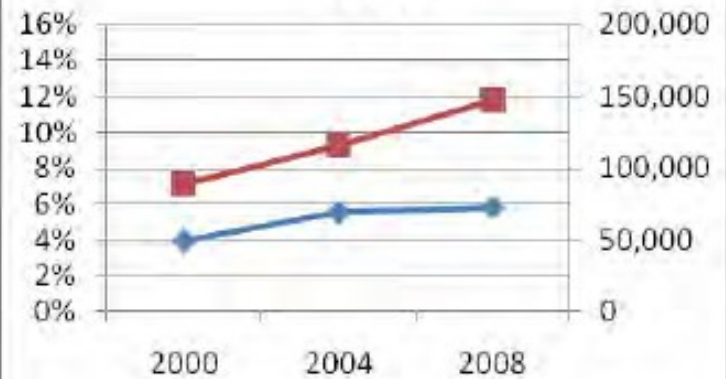
Republic of Korea



Germany

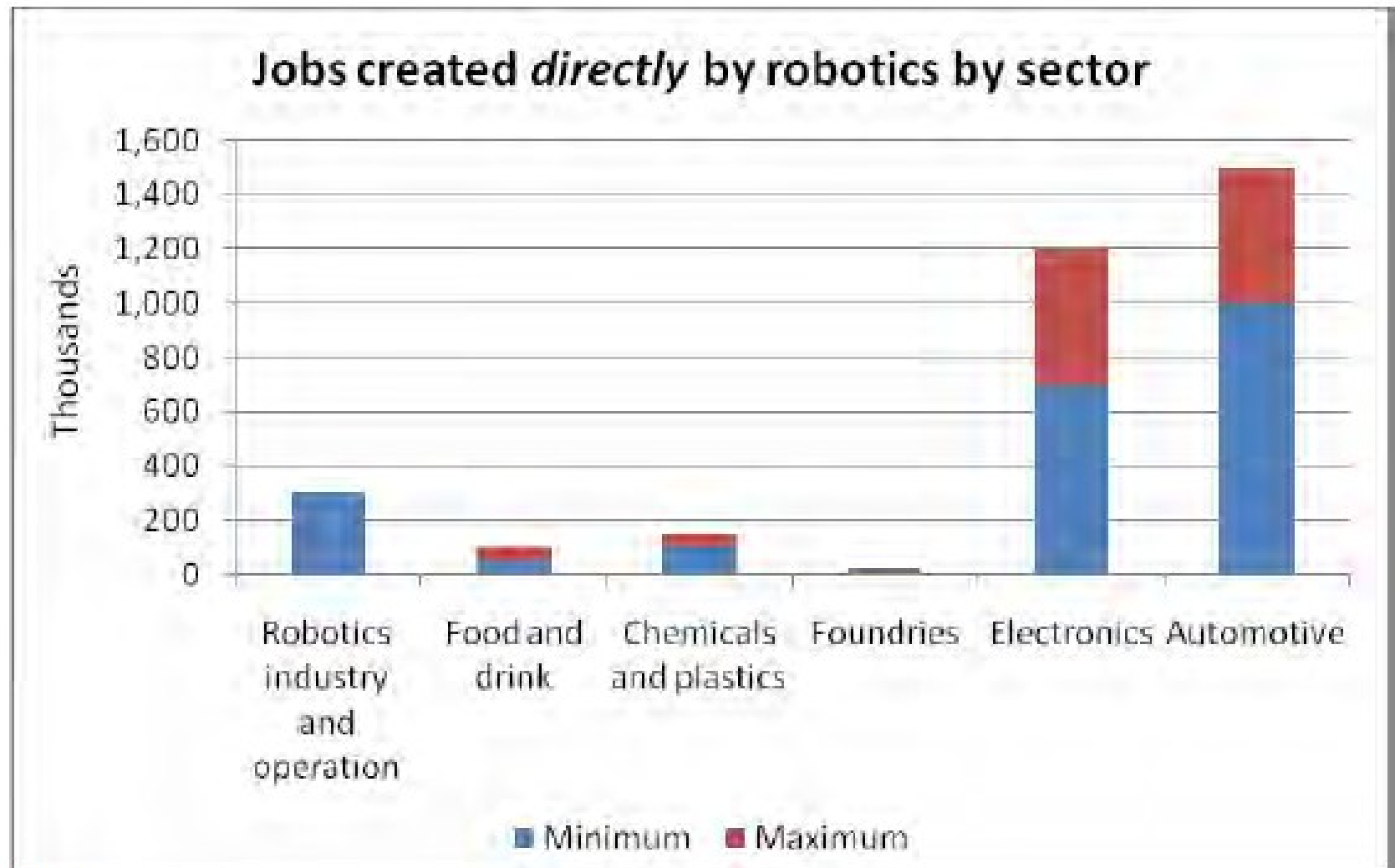


USA

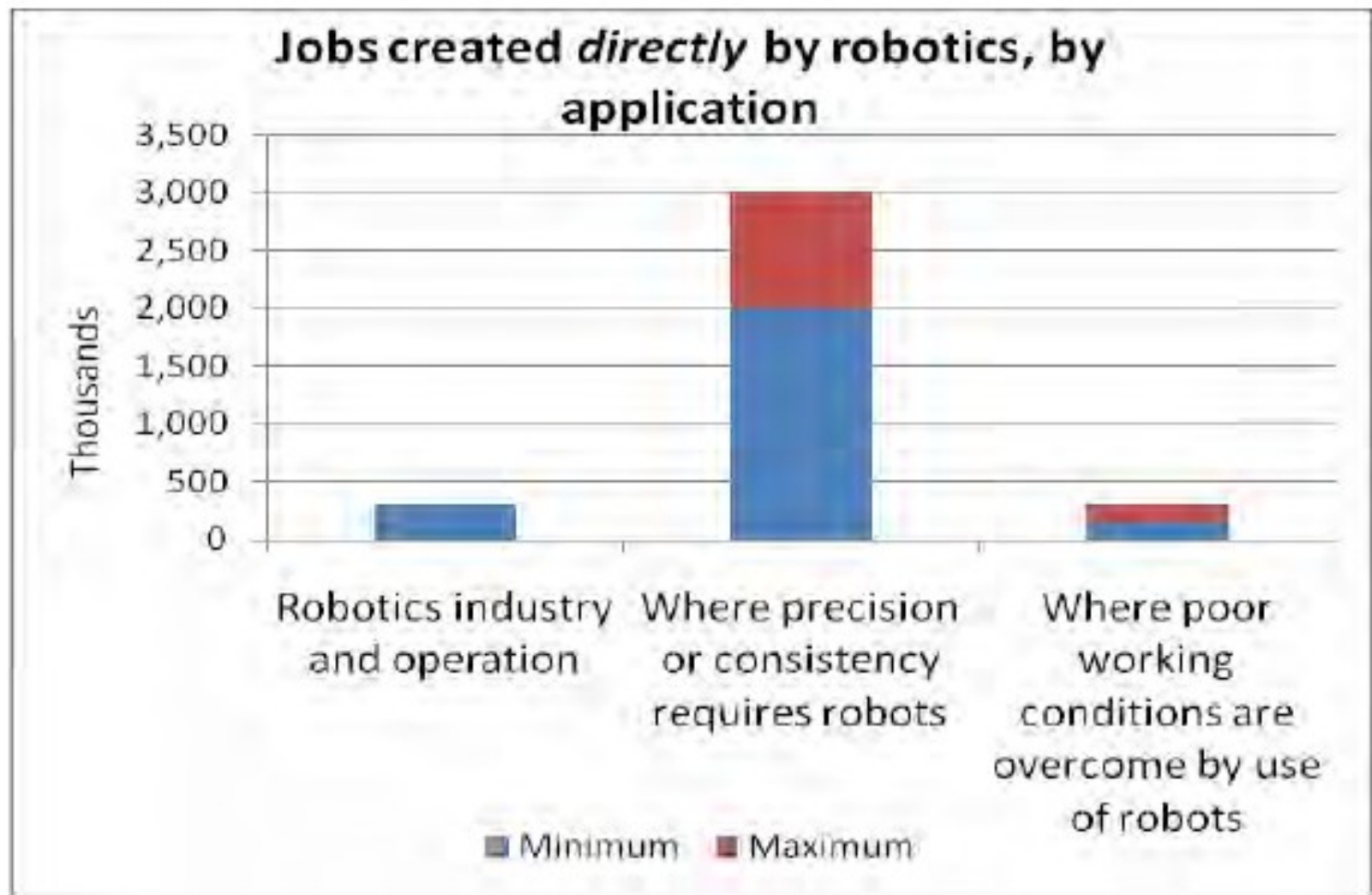


- - No. of Robots
- ◆ - Unemployment %

Future of Industrial Automation



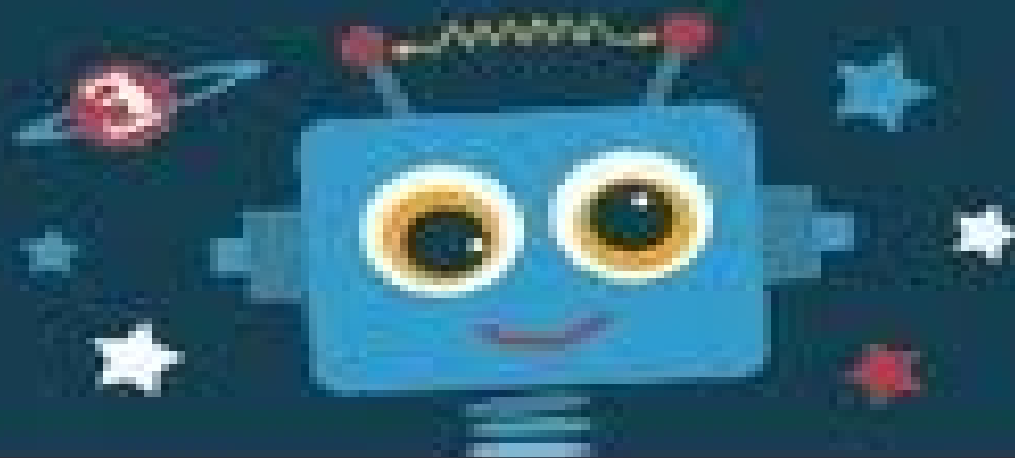
Future of Industrial Automation



Conclusion

- The goal of this paper was to outline the concept of industrial automation along with its various aspects such as advantages of automation over manual operations, tools to setup industrial automation, its various applications and types of industrial automation etc

Thank



You!

Queries

