

# Operations

*Optimize workflows, use materials, energy and water efficiently and monitor and control processes to reduce costs and improve productivity and quality*



Building Back  
Business from  
Crisis

---

**MSME**

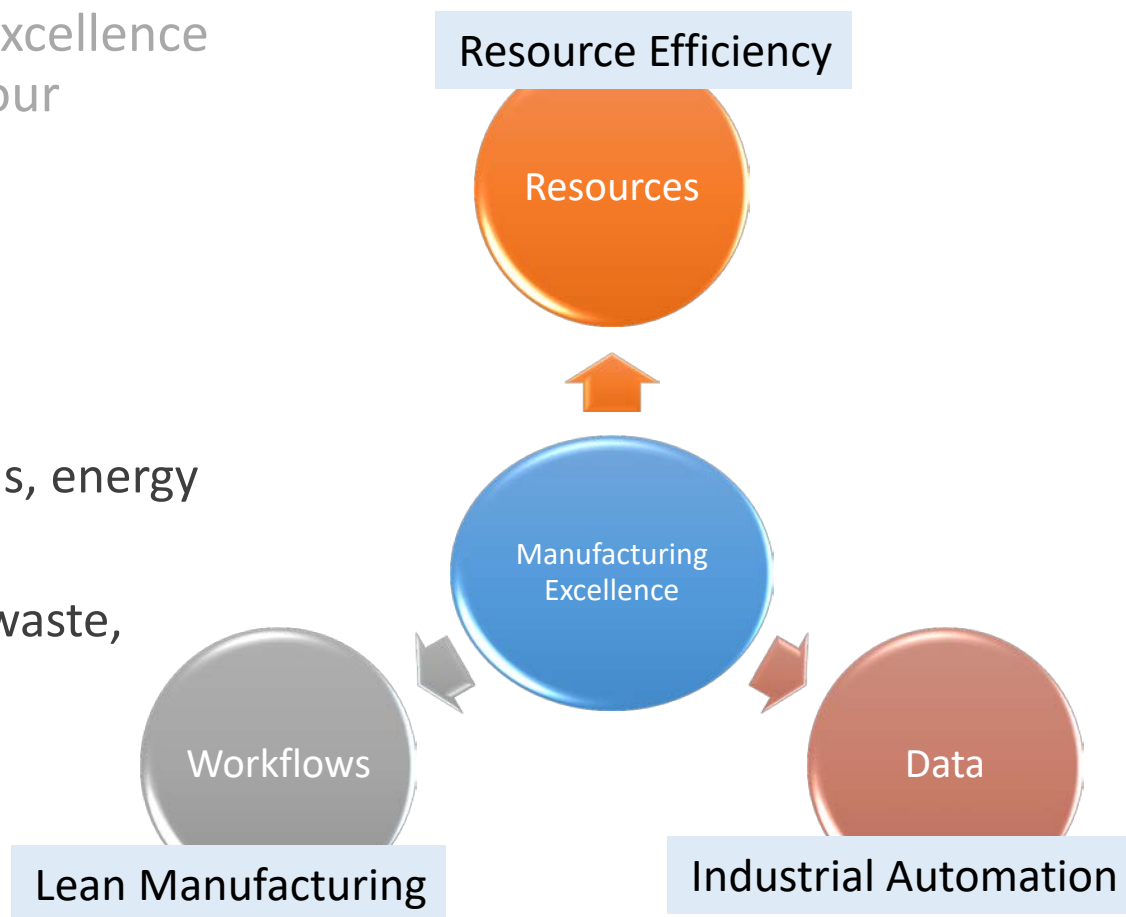
An Initiative of the United Nations Industrial  
Development Organisation

In partnership with



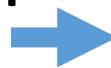
# Making Your Operations Future Ready

- Strive for manufacturing excellence to save costs and revive your business
  - Data-driven
  - Higher productivity
  - Lower defaults
  - Reduced use of materials, energy and water
  - Reduced generation of waste, effluent and emissions

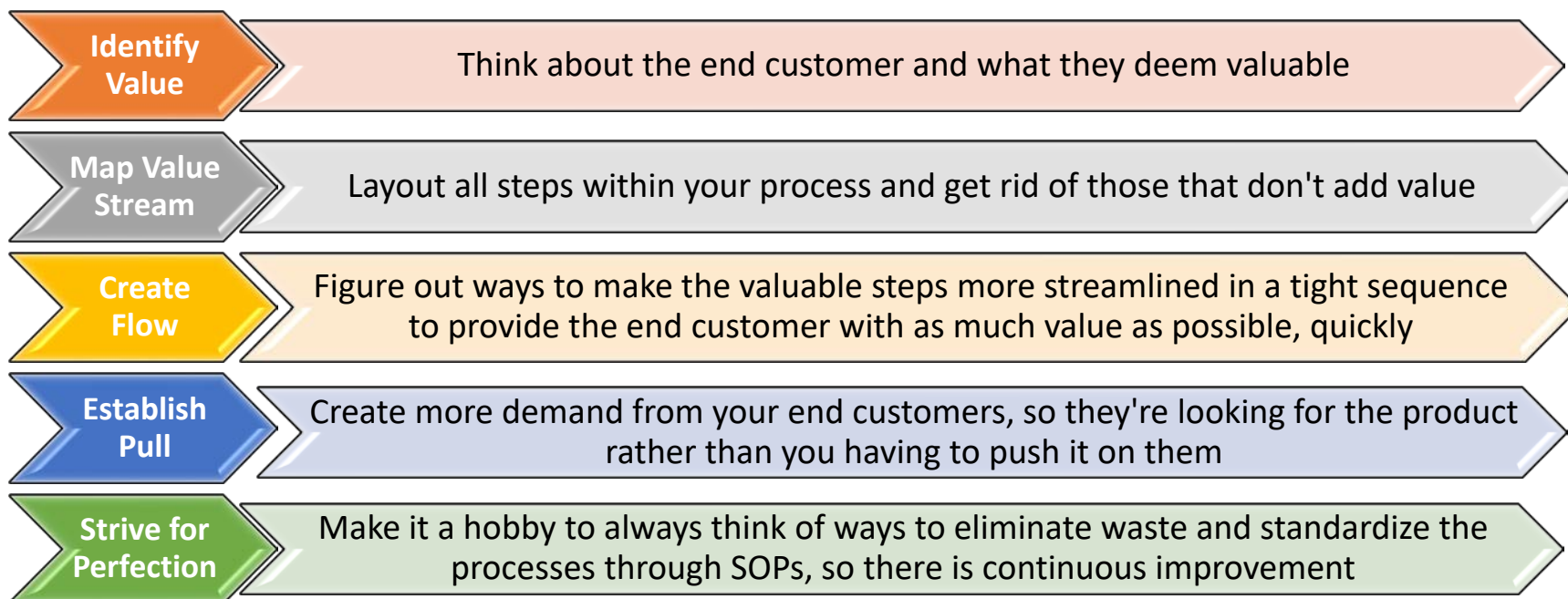


# Lean Manufacturing









**Lean - a systematic approach of elimination of waste so every step adds value for the customer**



- Visualize factory
- Service and maintain equipment
- Decongest workstations & storage areas
- Optimize work flows and space utilization

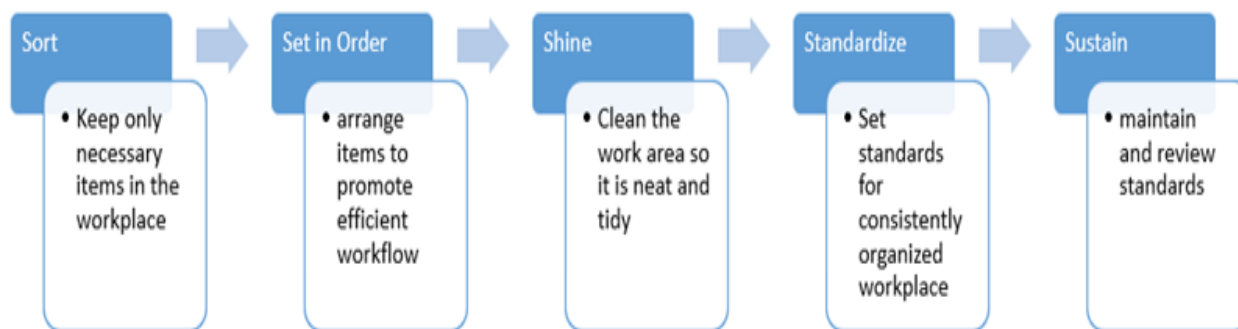


# Minimization of 8 Wastes

<p><i>Defects</i></p> 	efforts caused by rework, scrap and incorrect information	<p><i>Transportation</i></p> 	unnecessary movements of products and materials
<p><i>Overproduction</i></p> 	production that is more than needed or before it is needed	<p><i>Inventory</i></p> 	excess products and materials not being processed
<p><i>Waiting</i></p> 	wasted time waiting for next step in a process	<p><i>Motion</i></p> 	unnecessary movements by people (e.g. walking)
<p><i>Non-Used Talent</i></p> 	underutilizing people's talents, skills and knowledge	<p><i>Extra Processing</i></p> 	more work or higher quality than is required by the customer

# Optimise Workflows

- 5S



**Standard operating procedures** are written, step-by-step instructions that describe how to perform a specific activity

- **Single Minute Exchange of Dies** for Quick change over (starts at end of last good product and ends with first good product of new batch)
- **Kanban** an agile project management tool that visualizes work, limits work-in-progress, and maximizes efficiency (or flow)
- **Cellular Manufacturing** for families of parts within a single line or cell of machines operated by machinists who work only within the line or cell
- **5S Standardisation: Standard Operating Procedures** (SOPs) fine-tune to ensure best efficiency and productivity of process
- Gets work force to involve and contribute to **self-assessed feedback** and changes that they will drive and feel responsible for



# Resource Efficiency

I  
n  
c  
r  
e  
a  
s  
e



**Material  
Productivity**

Selection and  
efficient use  
of **materials**



**Waste  
Intensity**

Reduction  
and safe  
disposal of  
**waste**



**Water  
Productivity**

Sourcing and  
efficient use  
of **water**



**Waste Water  
Intensity**

Reduction  
and  
treatment of  
**waste water**



**Energy  
Productivity**

Selection and  
efficient use  
of **energy**



**Emission  
Intensity**

Reduction  
and control of  
**air  
emissions**

D  
e  
c  
r  
e  
a  
s  
e





# Resource Efficiency

Input  
Change



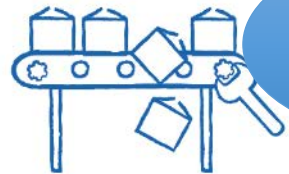
Better  
Process  
Control



Good  
House-  
keeping



Equipment  
Modifi-  
cation



Resource Efficient  
and Cleaner Production

Product  
Modifi-  
cation



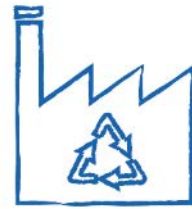
Technology  
Change



Production  
of Useful  
Byproduct

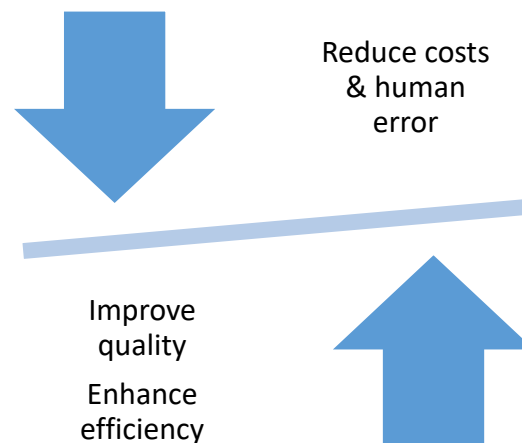


On Site Reuse  
& Recycling



## Data Driven Industrial Automation

- **Industrial automation** uses control systems & information technologies for handling different industrial processes & machineries to reduce human intervention

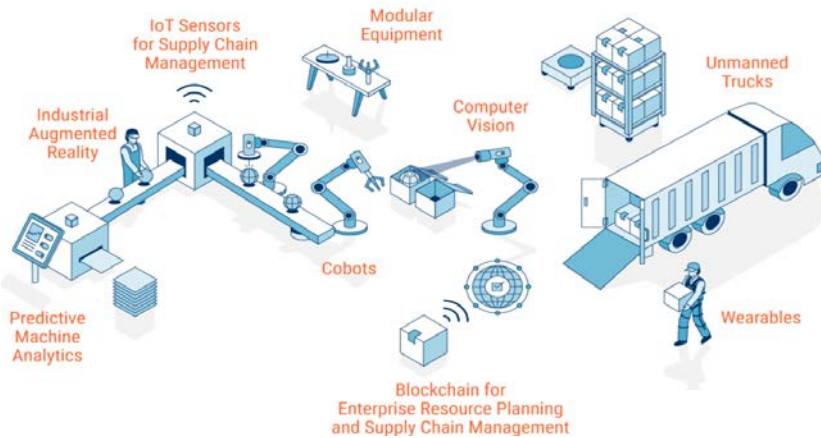


- Basic automation with sensors and switches connected to VFD, PLC etc to control one machine/process at a time following pre-set programmes
- Advanced automation involves autonomous (through artificial intelligence) and connected (through Internet of Things) systems.
  - Ability to predict and correct machine performance and health for early detection of safety issues and machines and maintaining maximum efficiency at all times





# Data Driven Automation: Industrial Automation



**Resource Planning & Sourcing:** On-demand decentralized manufacturing and blockchain projects works on complexities of integrating suppliers.

**Transport & Supply Chain Management:** Telematics, IoT, and autonomous vehicles brings greater efficiency and granularity

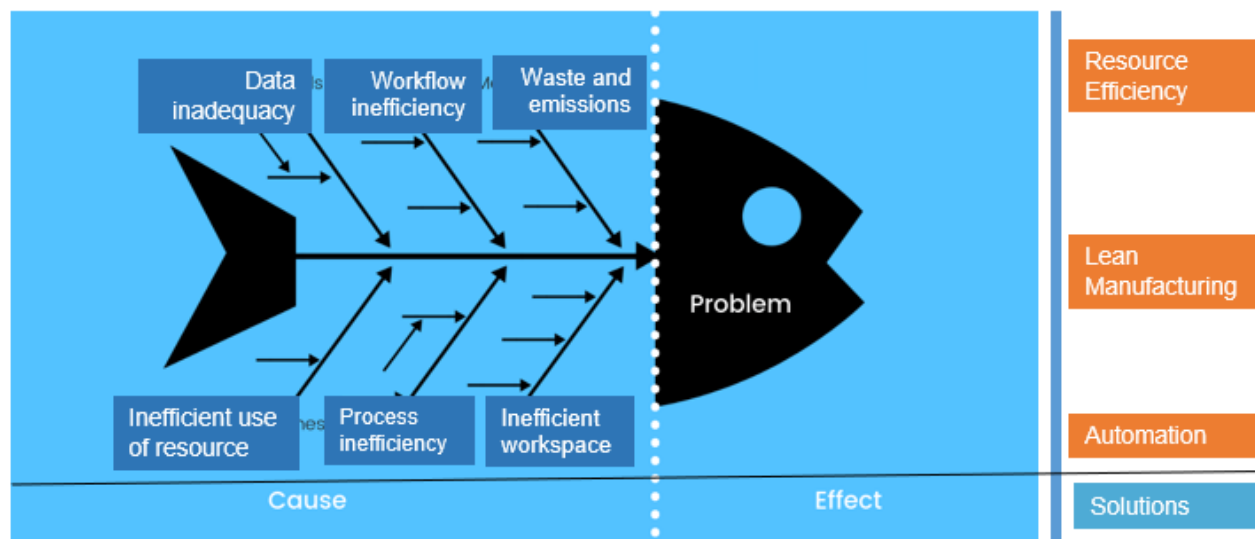
**Quality Assurance (QA):** computer vision finds imperfections, and software and blockchain tech enables quick identification of problems

**Machining, Production & Assembly:** Modular equipment and custom machines like 3D printers enables manufacturers to handle greater demand for variety.

**Operations Technology Monitoring & Machine Data:** IT stack and platforms powering future factories first through basic digitization, and further with greater predictive power

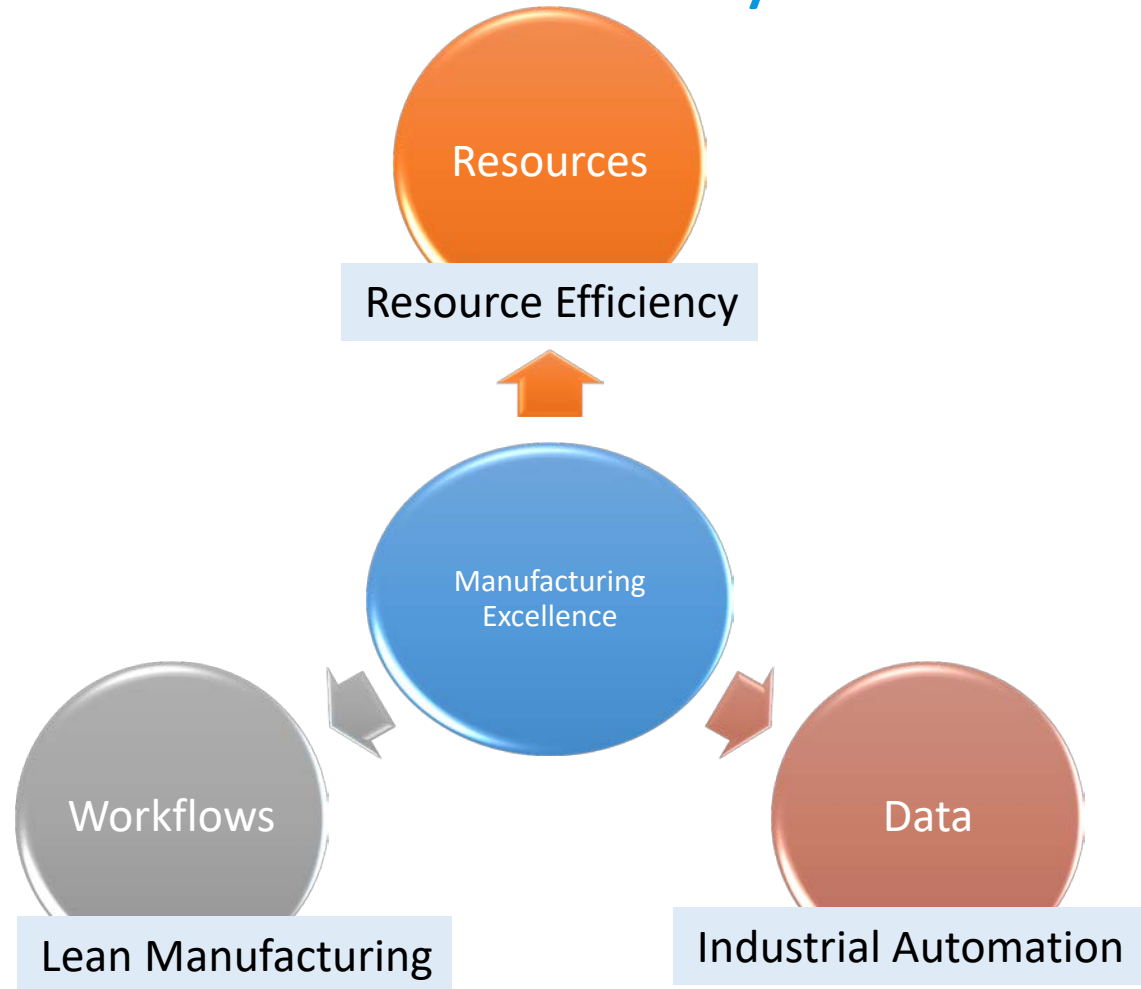
# Continuous Improvement

- Instill systematic
  - Problem definition and quantification
  - Root source and cause diagnosis
  - Solution selection and implementation
- Through team work, potentially supported by analytical tools





# Making Your Operations Future Ready



# Operations

*Optimize workflows, use materials, energy and water efficiently and monitor and control processes to reduce costs and improve productivity and quality*



Building Back  
Business from  
Crisis

---

**MSME**

An Initiative of the United Nations Industrial  
Development Organisation

In partnership with

