

Flexible Automation + Industry 4.0 = Transformation in Manufacturing.

THE EVOLUTION IN AUTOMATION

Fixed Automation (SPM)



Inflexible-no ability to change product or process

FIXED AUTOMATION

was designed to produce a Single product receptively.

Manual Changeover/ Programmable Automation



Ability to change over but labor intensive with Significant downtime

PROGRAMMABLE AUTOMATION

was designed to allow change one to some other products, but needs time and effort.

Fully Flexible Automation

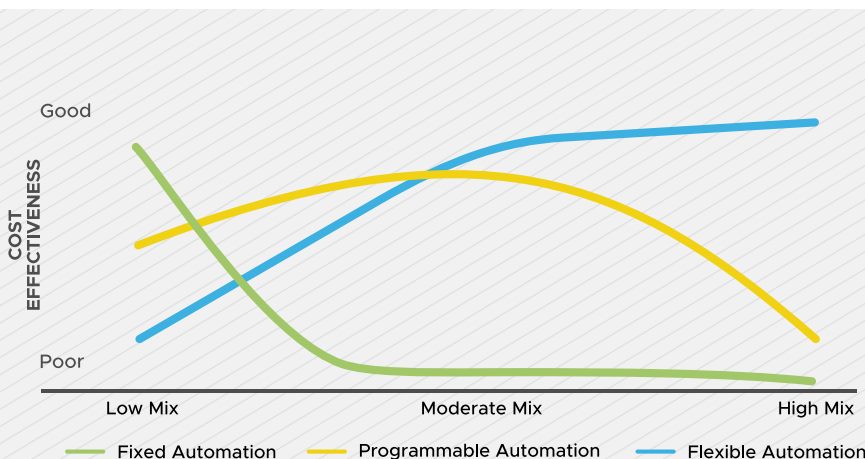


Quick/seamless conversion between product/process

FLEXIBLE AUTOMATION

is designed to seamlessly change from one to another product of same family or to a different family.

Cost Effectiveness of Automation



Once any product variability is introduced into the system, fixed automation becomes extremely ineffective from a cost standpoint. Conversely, flexible automation becomes more cost-effective as product mix increases and becomes the optimal solution once a moderate mix is achieved.

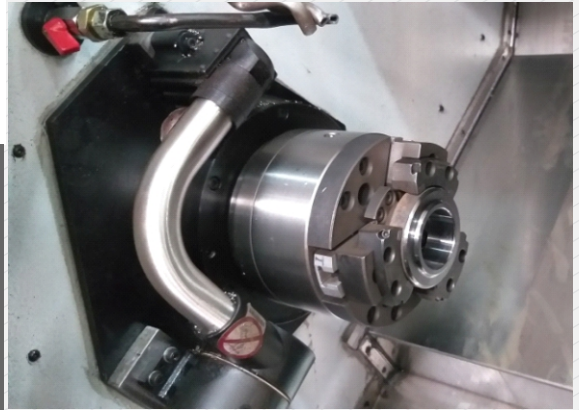
Key Elements Flexible Automation

Camera to identify & pick up Jobs from Conveyor

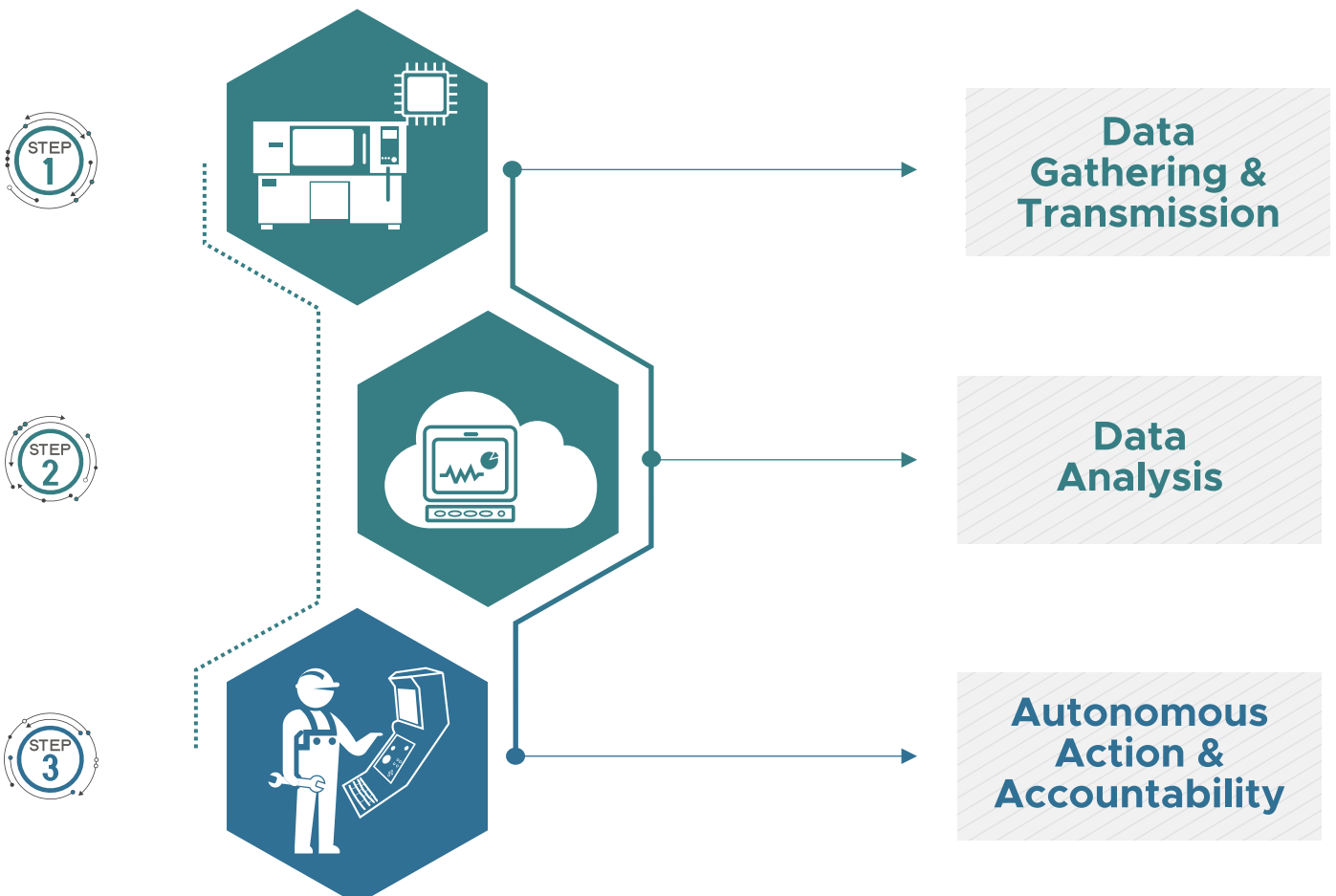


Robot Gripper with Large Range

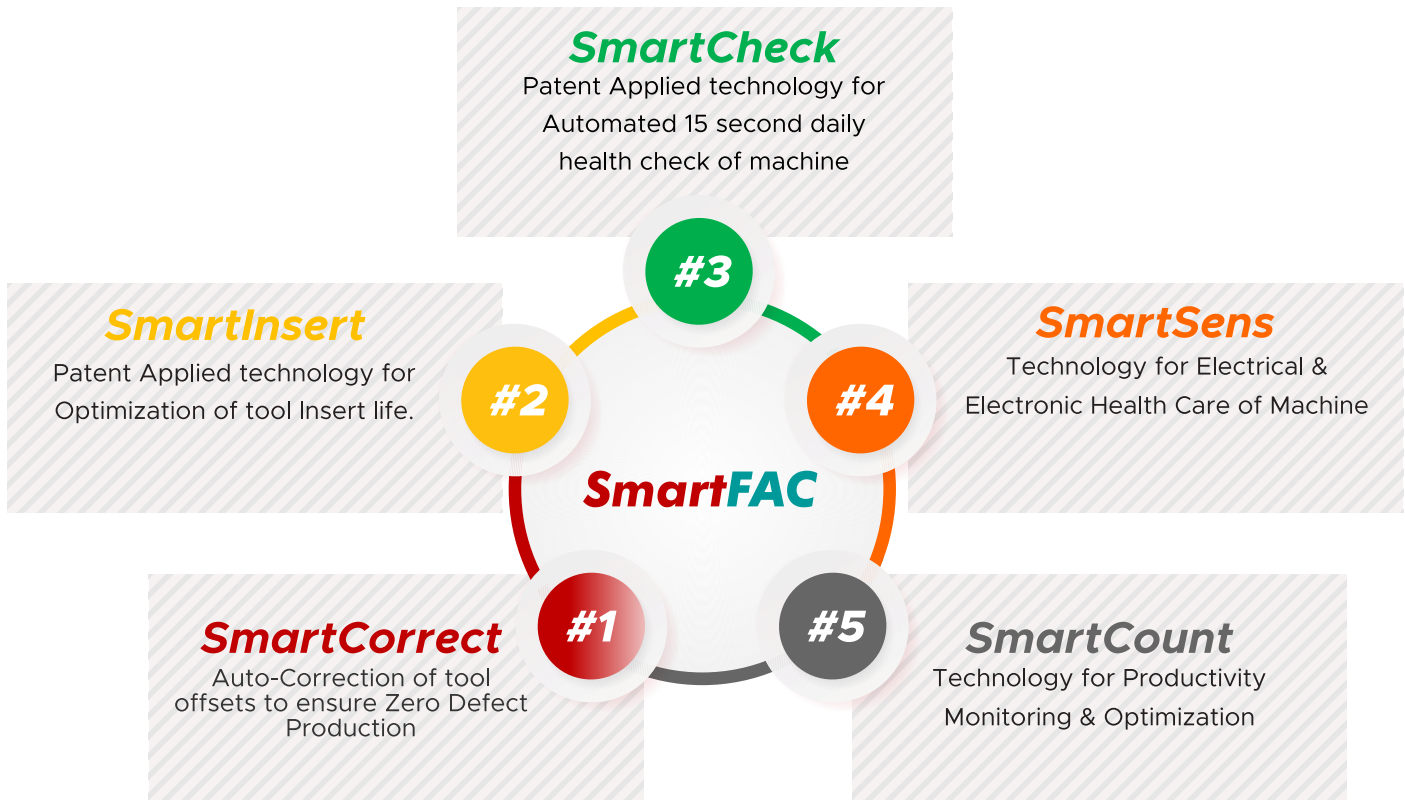
Quick Change Jaws of Workholding system



SmartFAC : Industry 4.0 Re-imagined



5 Modules of **SmartFAC**



SmartFAC-Basic

It offers many advantages over other Industry 4.0 solutions and results in huge improvements in machine performance.

EASY TO ACCESS

Since **SmartFAC-Basic** is Internet based, Data it is available on Mobile, Tablet or Computer from anywhere in the world.

EASY TO GET STARTED

Everything is pre-installed on the machine and 'Industry 4.0' features are operational immediately after installation & powerup of machine.

EASY TO UNDERSTAND DATA

Only relevant data is displayed so that it is easy to understand and initiate action.

EASY TO AUTOMATE ACTIONS

SmartFAC Basic has patent filed **SmartACT** technology which makes it easy for user to automate actions based on user selected limits.

SmartPAD 4.0

Custom designed Keypad for easy input of Industry 4.0 data on the machine.



Transformation in Manufacturing.

SmartFAC REDUCES

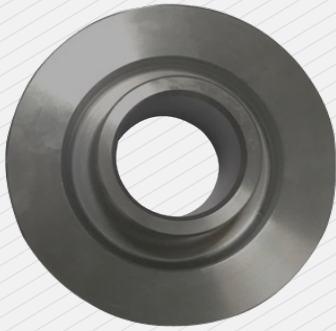
- Cycle Time
- Tool Cost
- Machine Breakdowns

Flexible Automation + Industry 4.0 (SmartFAC) has a COMPOUNDING Effect

Jump in OEE X

Higher Output / hour

CASE STUDY Job : Gear Blank



Competitor manual operated machine

Vs.



Marshall Roboturn Cell with Industry 4.0 Technology

Floor to Floor time = **107 Sec.**

Average Production / Hour = **33.5 pc**

Avg. M/c running hours per day = **17.8**
because of various scheduled and
unscheduled stoppages.

Avg. Production / day =
 $33.5 \times 17.8 = \mathbf{596 \text{ pc.}}$

Floor to Floor time = **96 Sec.**

Average Production/ Hour = **37.5 pc**

Avg. M/c running hours per day = **22.9**
because of Automation and
Industry 4.0

Avg. Production / day =
 $37.5 \times 22.9 = \mathbf{858 \text{ pc.}}$

44 % Extra Output → **“HUGE JUMP IN PROFITS”**



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