FANUC INDIA

Smart Manufacturing

&

Need of New Age Skill
Brief on FANUC Corporation

- Fujitsu Automatic NUmerical Control
- Since 1956 developing CNC & Servo Systems
- 1972 FANUC became independent from Fujitsu
- R&D and Production in Japan
- High Automation Level at own Production
- * 5000 Robots working in factory

Current Monthly Production / Capacity
- 40,000+ CNCs
- 200,000+ Servo Motors
- 7000+ Robots
- 5000+ Robo Machines

Basic Rules of Product Development
- Reliability Up
- Cost Down
- ‘Weniger Teile’ (Less parts)

Highlights of Global Market
- 64% share in CNCs (81% in India)
- 35% Share in Robots (55% in India)
Intake Vs Placement - AICTE Approved Institutions in India

Approve Intake/Enrollment

<table>
<thead>
<tr>
<th>Year</th>
<th>Intake</th>
<th>Placement</th>
<th>Students Passed</th>
<th>Enrollment</th>
<th>Intake</th>
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<td>2012-2013</td>
<td>0.55 M</td>
<td>1.25 M</td>
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<td>2013-2014</td>
<td>0.60 M</td>
<td>1.35 M</td>
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<td>2014-2015</td>
<td>0.66 M</td>
<td>1.42 M</td>
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<td>2015-2016</td>
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<td>2.02 M</td>
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<td>2.12 M</td>
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<td>2016-2017</td>
<td>3.70 M</td>
<td>3.83 M</td>
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<td>3.72 M</td>
<td>3.46 M</td>
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IN INDIAN SHOPFLOOR & CHALLENGES

- Delayed Production Reports?
- Real Time Breakdown data / Analyses ??
- Production Planning / new product execution
- Lack of experts for data analyses etc…??
Accumulated FANUC Population in India

GROWTH OF INDIAN MANUFACTURING INDUSTRY
Today’s Need IoT?

Internet- Connects People – “Internet of People”

IoT- Connects Things – “Internet of Things”
Why IoT?

- Dynamic control of industry and daily life
- Improve the resource utilization ratio
- Better relationship between human and things
- Intellectual entity by integrating human & physical systems
- Flexible configuration
- Universal transportation and internetworking
- Accessibility and Usability
- Act as technologies integrator
Why FANUC IoT?

- Equipment monitoring
- Tack-time & Bottleneck operation monitoring
- Production & Process monitoring
- Analysis of data
- Optimizing the process and operation
- Diagnostics & Troubleshooting
- Predictive and preventive maintenance
- Improvement of equipment efficiency
- Data sanctity
- Meeting customer demands
- Flexibility
- Inventory Management
Industry Size for IoT requirement

**Business Potential**

- India - Around 60,000+ FANUC products are installed in the field with ready hardware suitable to implement FANUC IoT concepts.

- India – Further 60,000+ more domestic FANUC installations can be hooked with FANUC IoT by adding simple interfacing hardware.

- World wide – Around 3.4 million Installations around the world with possibilities of FANUC IoT
**FANUC** approach towards **IoT**

- **FOCAS** 2004
- **MT-LINKi** 2015
- **FIELD Base 0** 2016
- **FIELD** 2016-17

- **Only library**
- **Staggered data**
- **Need appl. prog**
- **Less flexible**

- **A software**
- **Organized data**
- **Flexible**

- **A hardware**
- **FA environment**
- **ECC Supported**
- **No data loss**

- **A software**
- **Open source**
- **Applications**
- **Deep learning**
FANUC INDIA

FANUC IoT

FANUC Business association for IoT

FIELD

MT-LINK i

Visualization
Diagnosis Notification
Data collection
Communication interface

FOCAS

VB, VC++, .Net

CNC Screen Display Function
Basic Operation Package 2
User Customized Applications

FOCAS2

Drivers

CNC

Machine Remote Diagnosis Package

MTB

CNC screen display function
CNC diagnosis
PMC diagnosis

End user customer

System Integrators
FANUC Approach to Bridge the Knowledge Gap

• System Integrators (SI) to implement FANUC IoT at end user customers as per their requirement.

• Educate, train and support SI to provide optimal solutions to improve OEE of end users using FANUC IoT.

• FANUC India will provide application support to System integrators to use FANUC IoT products and support in providing a total IoT solution to end user customers.
**FANUC Edge Heavy Computing Concept**

Approach to IoT of FANUC

Fog

- MT-LINKi
- FIELD system
- Deep Learning
- OPC, FOCAS, Robot Interface
- FANUC Apps
- MTB/Integrator Apps

Edge

- Machine, Robot, PLC, Sensor devices

Clouds

- Web Server Function
- Machine Remote Diagnosis
FANUC Initiatives for Future Skills

• Training Customers at FANUC Training Schools at Bangalore, Pune & Manesar.

• On site Training to customers on FANUC Products.

• Train the Trainer Program.

• FANUC India Technical Centre visit by Colleges (3rd & 4th Year Engineering students).

• Signing MoU with Technical Institutes.

• Joint Certification with Training Centres and Technical Universities.
1. **Teja Technical Training Institute, Chennai**
   (CNC, Robots & MT Link i) Conducts training for Educational Institute.
   Discussing with Anna University and IIT-M for Sandwiched courses.

2. **PSG College of Technology, Coimbatore**
   (CNC, Robots) PSG has set up FANUC Centre of Excellence, including for Arc Welding Robot.

3. **ACE Technologies**
   (Small lathe + CNC Simulators) 10 no's of Lathe packages for Trainer Lathe requirements at various colleges + 4 no's of CNC Simulators for IGTR- AMD and 1 no of CNC Simulator for in-house use sold.

4. **Bannariamman Institute of Technology, Erode** (June’17)
   (CNC and Robot) Will be starting P G Course in Mechatronics and will be conducting vocational training programmes on CNC and Automation.

5. **Sona College of Technology, Salem** (June’17)
   (Robot and NC Guide) They are planning for UG course for 4semisters and PG course for automation Specialization.

6. **Srilanka Institute of Technology, Colombo** (June’17)
   (Simulator and NC Guide) Already taken up by SIT for budgeting and expecting agreement within next few weeks.

7. **Automotive Training Centres** – MSIL Centre of Excellence & HCIL
FANUC Products for Training
Simulation software you can learn CNC on PC

Feature

• Learning operation or display of CNC options
• Study of machining programming
• Pre-check of machining program
• Development of PMC ladder and custom software
CNC Simulator

CNC Simulator unit suitable for learning CNC with real operational feeling

Features

• Learning of the same operations as CNC
• MANUAL GUIDE i installed for easy programming
• Mill and Lathe system switchable on one simulator
FANUC ROBOGUIDE

- Modeling
- Model library
- CAD interface
- Layout
- Optimization

- Program generation
- Simulation
  - Cycle time
  - Motion path
  - Interference

- Layout calibration
- Prior verification for site touchup

- Cycle time analysis
- System down monitor
- On-line monitor
- Data backup

System Design → Offline Programming → System Installation → Production Maintenance

ROBOGUIDE

- From system design to maintenance, ROBOGUIDE stores all information and know-how
- ROBOGUIDE provides a shared database for robot system lifecycle management

Robot System Supporting Tool
FANUC IoT

Smart Factory

Smart Manufacturing
We - FANUC will continue…

To provide excellent support to our Customers and Train New Engineers to take up NEW AGE CHALLENGES for establishing WIN – WIN situation in all means.

Web: www.fanucindia.com

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