Setkání obchodních ředitelů Svazu strojírenské technologie 2020

FIELD system FANUC's IoT

October 22, 2020

Konrad Grohs, Director IoT Business, FANUC Europe Corporation

CONTENTS OF PRESENTATION:

Profile of FANUC

Headquarters: Oshino-mura, Yamanashi Prefecture, Japan

Number of employees: 8,164 *(as of March 2020)*

Sales: 508 Billion JPY *(19.5% in Europe)*

Ordinary Income: 103 Billion JPY

Net Income: 73 Billion JPY

FANUC Europe: Profile

- ✓ 100% Subsidiaries of FANUC Corporation
- ✓ 22 subsidiaries including Russia
- ✓ Covering Europe, Russia, North Africa and Israel
- ✓ Over 1,600 employees

FANUC Nordic 1981 — 45

FANUC Russia 2003 — 38

FANUC UK 1983 — 135

FANUC Europe 1982 — 247

FANUC Poland 2002 — 63

FANUC Slovakia 2017 — 17

FANUC Europe GmbH 2018 — 104

FANUC Benelux 1996 — 41

FANUC Czech 1998 — 55

FANUC Hungary 2006 — 50

FANUC Ukraine 2014 — 6

FANUC Germany 1980 — 302

FANUC France 1978 — 188

FANUC Austria 2014 — 20

FANUC Romania 2017 — 15

FANUC Switzerland 1988 — 54

FANUC Adria 2013 — 16

FANUC Bulgaria 1980 — 11

FANUC Iberia 1987 — 91

FANUC Italy 1987 — 141

FANUC Serbia 2019 — 4

FANUC Turkey 1995 — 48

FANUC Israel 2018 — 5

FANUC Czech Facility in Prague

Completion in April 2021

FANUC Czech

Number of employees:

- **totally 55 employees**
- **21 technicians for service**
- **21 employees for sales and technical support**
- **13 employees for finance, administration
  and marketing**

Main activities:

- **CNC, Robot, Robomachine sales**
- **Spare parts stock**
- **Service**
- **Training**
- **Technical support**

Address:

K Bílému Vrchu
Praha 9 – Horní Počernice*

*since 4/2021

FANUC Academy

Capacity – 5 rooms, up to 14 people in each room (max. 2 people per machine)

Additional devices (Vision, conveyor, positioners…)

FANUC CNC simulators

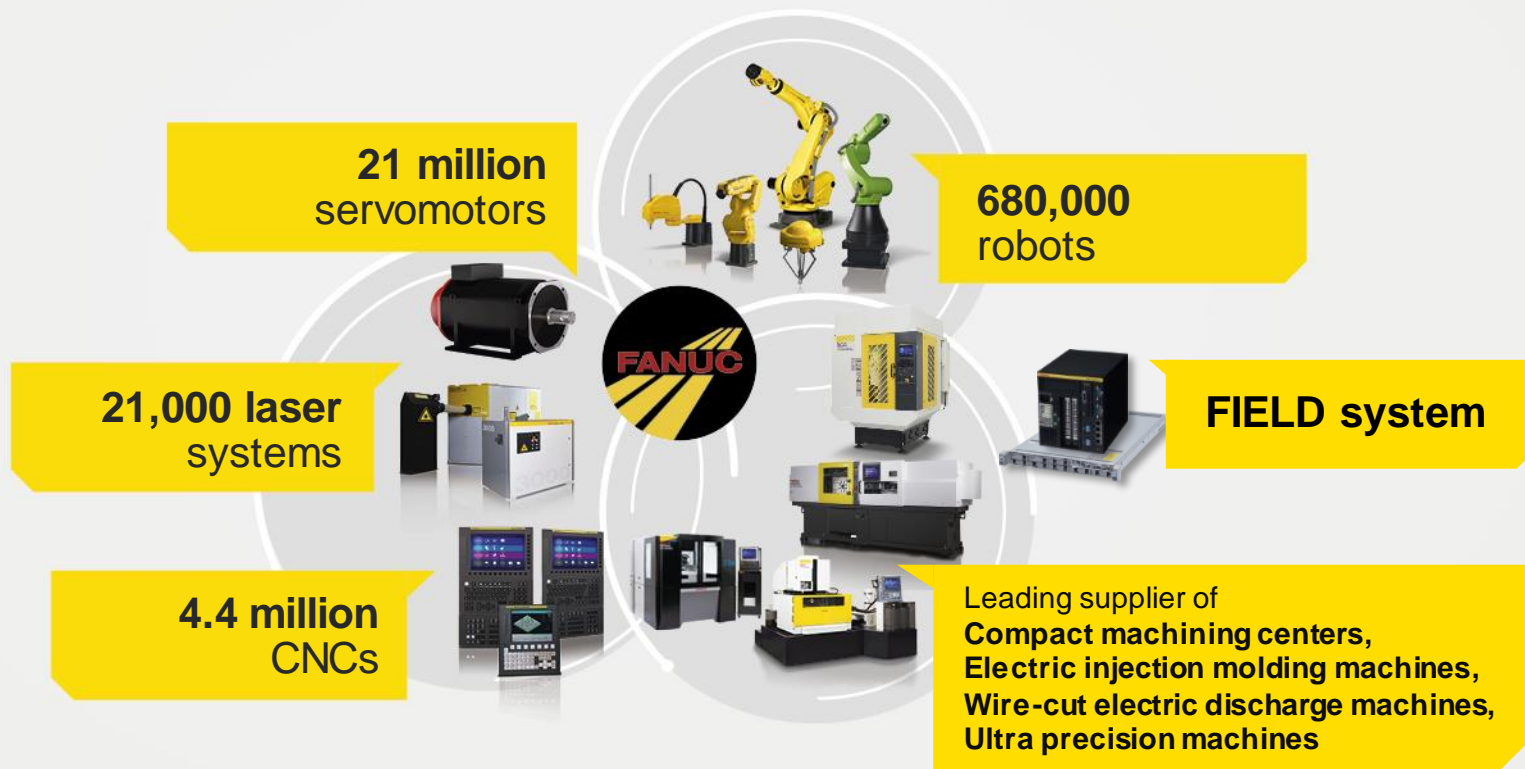**ROBOTS for training**

ROBODRILL, ROBOSHOT for training
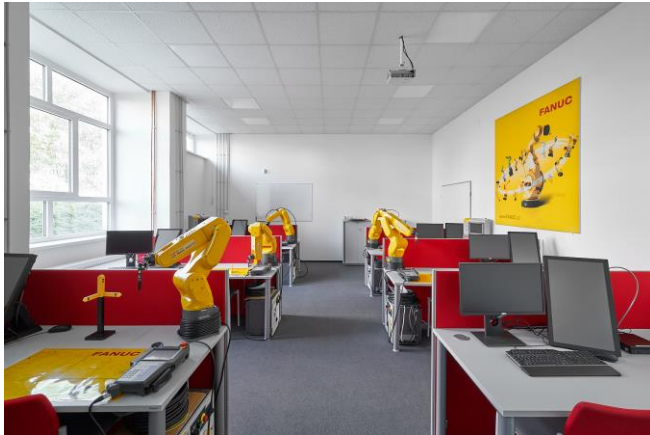
Service activities

- **Service repairs**
- **Preventive maintainance**
- **Technical support**
- **Remote diagnostic**
- **24/7 Hotline**
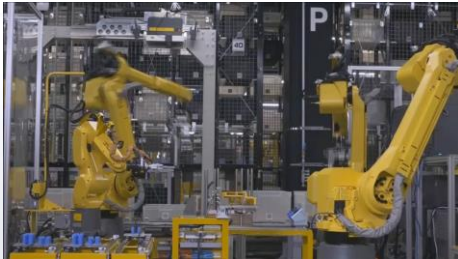
FANUC Core Technology
and Global Install Base

21 million servomotors

680,000 robots

21,000 laser systems

FIELD system

4.4 million CNCs

Leading supplier of
Compact machining centers,
Electric injection molding machines,
Wire-cut electric discharge machines,
Ultra precision machines

FANUC Factories
highly automated and robotized

Servo motor assembly

CNC assembly

Robot assembly

Machining

Cabinet assembly

Zero Down Time (ZDT)

ZDT (Zero Down Time): Concept

- To eliminate unexpected downtime, the preventive and diagnosis function provides trouble diagnosis information and maintenance notification.

- ZDT consists of 4 components

  Mechanical Health
  Reducer failure prediction
  Motor torque monitor

  Process Health
  Spot welding diagnostics
  Arc welding diagnostics
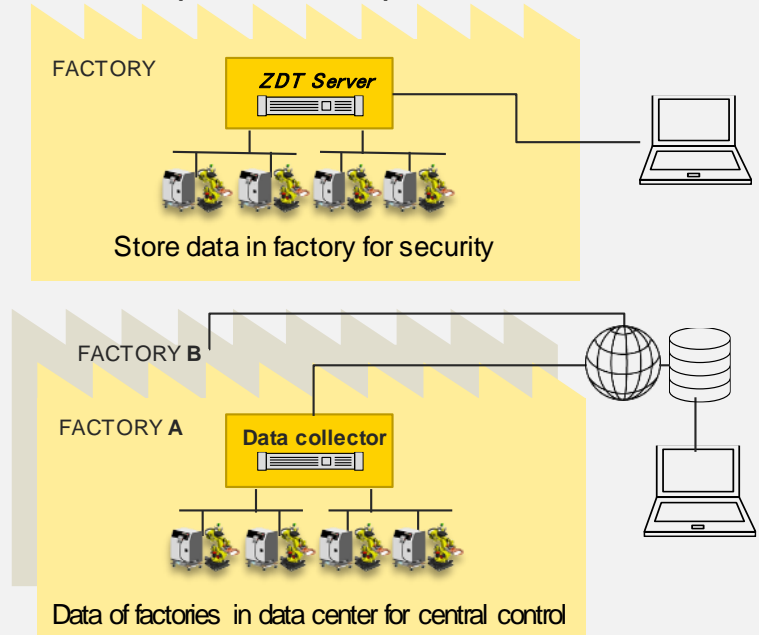
  Maintenance Health
  Maintenance reminder

 **System Health**
  Memory usage
  Alarm information

- Collecting/analyze data with IoT technology for efficient "predictable" preventive maintenance.

FACTORY

ZDT Server

Store data in factory for security

FACTORY **B**

FACTORY **A**

Data collector

Data of factories in data center for central control

ZDT : Prediction of Reducer Failure

- Customer forgot to grease after replacing reducer

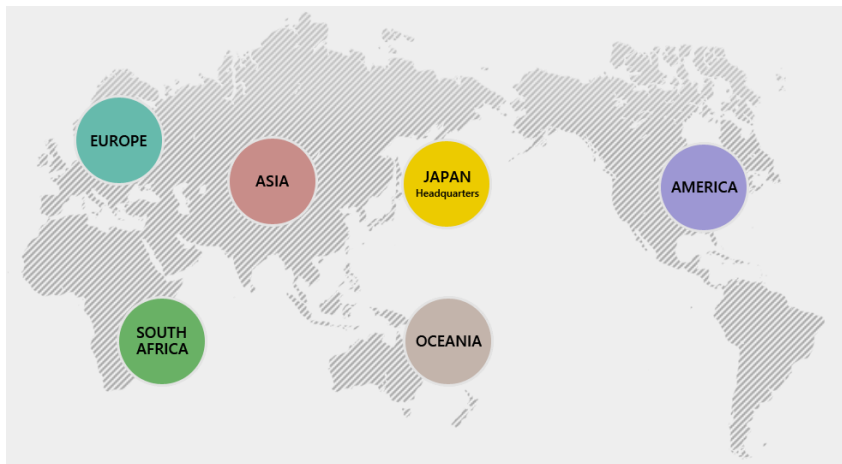- Prediction of the reducer failure prevented unexpected down time
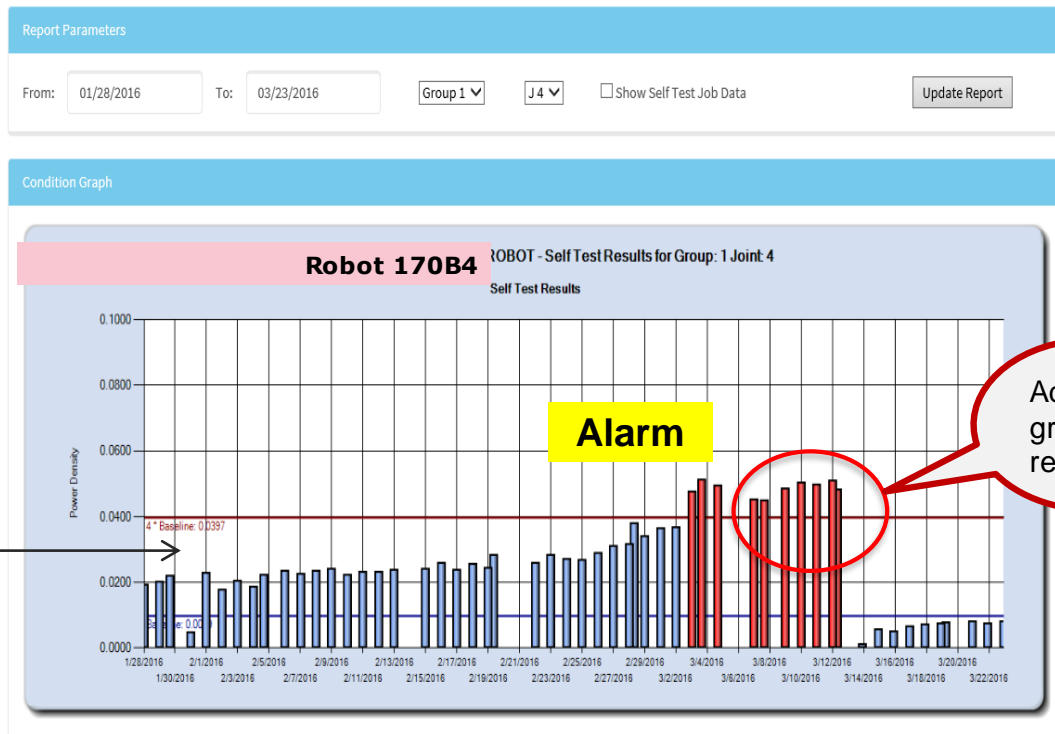
ZDT : Global Installed Base and Results

Connections

Connect about **20,000 robots**

Results

Analytics by service department prevent down time of **over 1000 cases**

	Detected Items
Mechanical Health	Reducer and motor torque failure, too many servo off
Process Health	Servo gun torque failure, paint analytics failure
System Health	Battery low

FIELD system

Open Industrial IoT platform on-premise

CONNECT
Connect various devices across manufacturers and generations

MONITOR
Integrated data visualization, analysis and improvement

Smart Machine Smart Factory
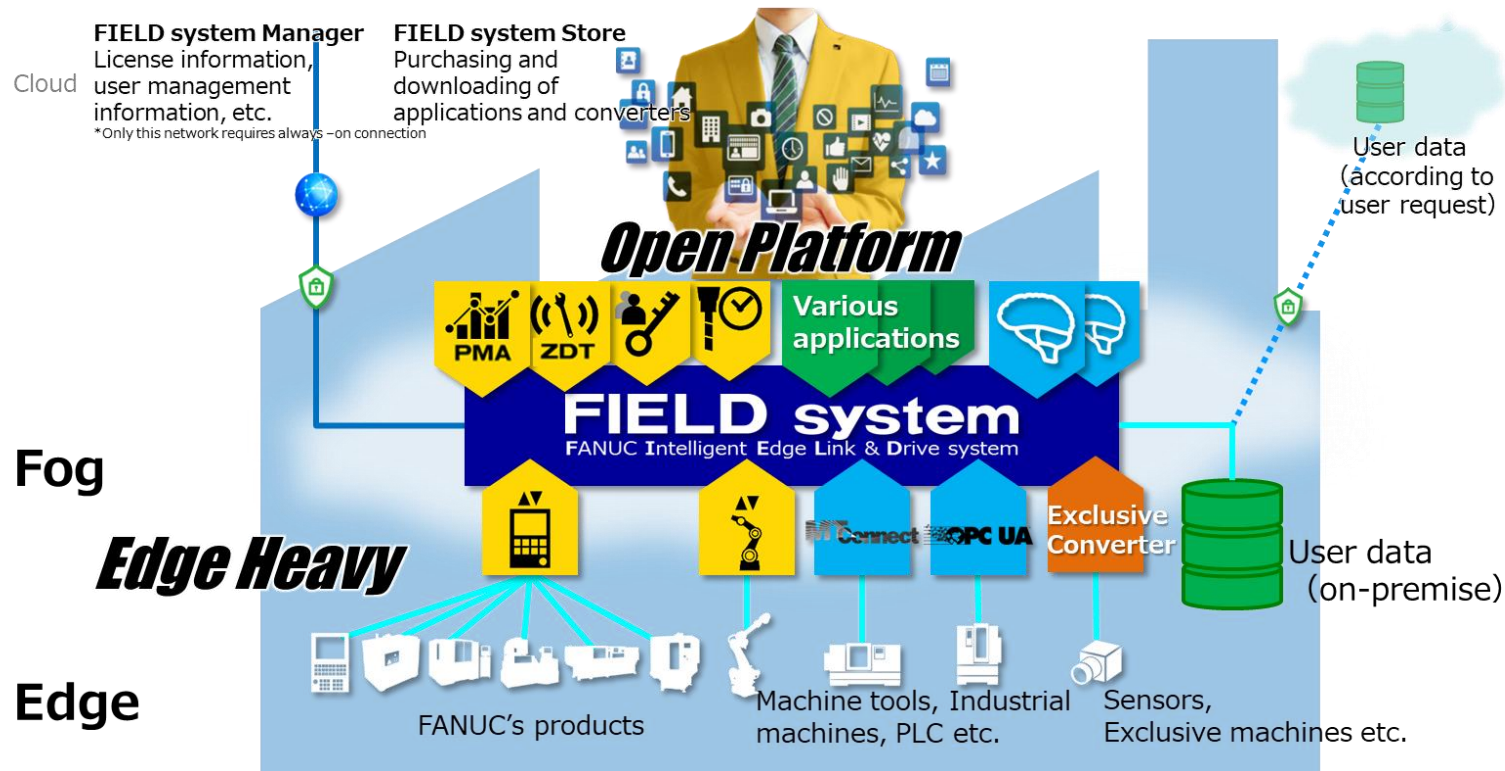Drive the machines at site smartly and efficiently to create a smarter factory

Edge Heavy
Most data are processed in Fog; user-data are stored on-premise

Open Platform
Develop and sell applications and converters freely

DRIVE
Control and drive edge equipment close to real time

THINK
Think with AI to realize smart automation and optimization

FIELD System : Conceptual Diagram of Connection

Cloud

FIELD system Manager
License information, user management information, etc.
*Only this network requires always –on connection

FIELD system Store
Purchasing and downloading of applications and converters

User data (according to user request)

Open Platform

Various applications

PMA ZDT

FIELD system
FANUC Intelligent Edge Link & Drive system

Fog

Edge Heavy

Connect OPC UA

Exclusive Converter

User data (on-premise)

Edge

FANUC's products

Machine tools, Industrial machines, PLC etc.

Sensors, Exclusive machines etc.

Why FANUC FIELD system?

Improve machines uptime

Reduce energy consumption

Reduce cost of consumables

Improve process quality

max

Increase Overall Equipment Efficiency (OEE)

FANUC's FIELD system = reliable Industry 4.0 platform

End Customer

MTB (or MTB Dealer) or Total Integrator

Cyber-secure installation of FIELD system
by knowledgeable and experienced European **Network Integrators**

System Integrator

Non-FIELD system Hardware (sensors, devices, machines)

Attractive **FANUC Apps**,

Attractive and checked **3rd Party Apps**, by **approved** and **innovative 3rd Party Software Application Developers**,
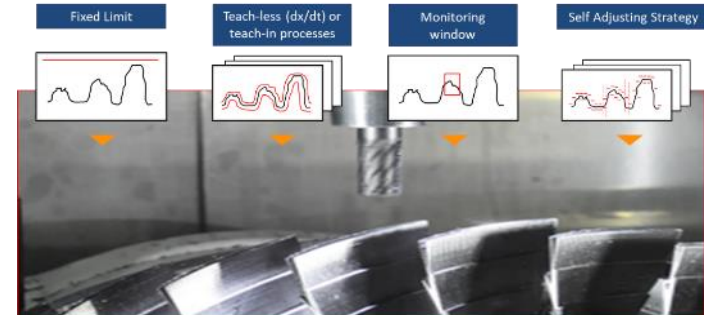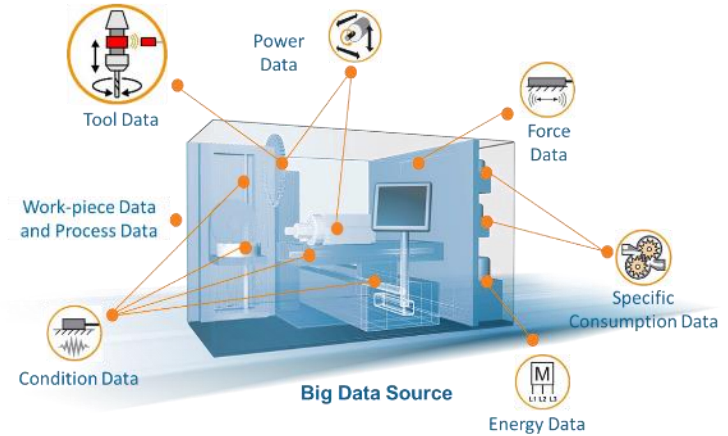
FIELD system
Reliable Industry 4.0 Platform

ARTIS C-DASHBOARD

- Extend cutting tool life by machining condition monitoring

- Detect cutting tool breakage

- Monitor process health

- Minimise machining quality issues

- Minimise machine downtime by condition monitoring

- Lower production cost per part

- Detect harsh machine usage or collisions

Many process monitoring strategies

Defect Inspection

- FIELD system supports AI algorithms.

- Such algorithms can be successfully applied in vision systems. **V7 Defect Inspection** delivers:

  - Fast quality inspection

  - Improved quality analysis

  - Enables inspection in areas previously impossible

  - Savings from reduced quality recalls

Vision supported by AI
for quality check

Thank you for your attention!

www.fanuc.eu