Industry 4.0 Awareness Seminars Reports Template

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1.	Date of the Seminar	09.08.2019
2.	Organizers	FSM & FICCI
3.	Title of the seminar	AWARENESS PROGRAMME ON INDUSTRY 4.0 The Indian Perspective
4.	Programme	Enclosed Annexure-I
5.	Report: suggested contents (1) Main takeaway / good suggestions, (2) Clusters covered, (3) Nos attended, (4) Success stories that need to be compiled / shared	Enclosed Annexure-II
6.	List of Speakers with contact details	Enclosed Annexure-III
7.	Presentations	Enclosed Annexure-V
8.	Resource persons for providing consultancy, skilling, guidance etc.	
9.	Photographs	Enclosed Annexure-IV
10.	Learnings from the seminar	Industry has a basic understanding of the concepts of Industry 4.0 at a broader level (as understood from the participants who attended the workshops). They are keen on understanding in detail about the applications of how to benefit from implementing Industry 4.0 through specific case. Working models and demonstrations of Industry 4.0 Applications were very well received by the participants. It was also quite engaging and insightful.

ANNEXURE-I

Department of Heavy Industry
Government of India

FSM
Smart Manufacturing Simplified

AWARENESS PROGRAMME ON INDUSTRY 4.0

The Indian Perspective

Date: Friday, 9th August, 2019

Venue: GNEC-IIT Roorkee, 20, Knowledge Park II, Greater Noida
Timing: 10:00 AM to 04:00 PM

Smart models of manufacturing and business are being created through collaborative and self-aware machines and processes. This has a direct impact on competitiveness and quality of goods and services. Samarth Udyog is the way forward for the Indian Manufacturing Ecosystem and is achievable in a manner that works for you. To strengthen the 'Make in India' eco-system with adoption of smart technologies, the Automation Industry Association and IIT Delhi have created a Special Purpose Vehicle, called the Foundation for Smart Manufacturing (FSM) to take the emerging wave of Smart Technologies and adapt it with relevance to the needs of Indian Industry. To facilitate, introduce and enlighten industry with an evolved genre of quality focused smart manufacturing, Department of Heavy Industry (DHI) supported by IITD-AIA Foundation for Smart Manufacturing (FSM), Federation of Indian Chambers of Commerce & Industry (FICCI) and IIoT India, bring to you an awareness workshop on Industry 4.0 – The Indian Perspective.

PROGRAM SCHEDULE

09:30 – 10:00	On-the-Spot Registrations
10:00 – 10:10	**Welcome Address and Introduction to the Session Theme** Mr. Anup Wadhwa, Director, Automation Industry Association
10:15 – 10:35	**Opportunities for Indian Ecosystem** Mr Ravi Agarwal, MD, Pepperl+Fuchs Factory Automation & President, Automation Industry Association
10:40 – 11:00	**Digital Transformation with Industry 4.0** Mr. Aashutosh Varma, Customer Solution Advisor, Nokia India & Member FICCI Industry 4.0.
11:05 – 11:25	Tea Break
11:30 – 12:20	**Bridging the divide between Machines and IT – Live Demo of Cyber Physical Assembly Line** Prof. Sunil Jha, Professor, IIT Delhi & Director, IAFSM
12:25 – 12:45	**Changing landscape for OEMs and Supply Chains** Mr Dilip Sawhney, Managing Director, Rockwell Automation India
12:50 – 13:10	**Assessment of Readiness for Industry 4.0 Transformation** Mr. Anup Wadhwa, Director, Automation Industry Association
13:15 – 13:45	Lunch Break
13:50 – 14:10	**Leveraging Augmented Reality to improve Workforce Productivity** Mr.Tushar Ghosh, Technical Manager (North & East), PTC India
14:15 – 14:35	**Improving Plant throughput automated machine vision inspection** Dr. Kaushik Saha, CTO, Samsung R&D
14:40 – 15:00	**Relevance of Additive Manufacturing beyond Prototyping** Mr Saroop Chand, MD, Adroitec Information Systems
15:05 – 15:20	**IIoT India: Reimagining the Future** Mr. Baldeep Singh, Country Head – SingEx India
15:25 – 15:50	**Panel Discussion and Q&A**
15:55 -16:00	Vote of Thanks
16:00 -16:30	Networking & Tea

Expected Participant Profile

- Owners, CXOs and Functional Heads from Automotive, General Engineering, FMCG and Food Processing Sectors
- Machine builders
- System Integrators

Enquiry and Registrations

Mr. Naman Kapoor: +91-8076197190, email: nkapoor@iafsm.in
Mr. Karan Bisht: +91-8527710029, email: karan.bisht@singex.com

Event Partners

FICCI AIA IIoT INDIA

ANNEXURE-II
SEMINAR REPORT

August 09, 2019
GNEC-IIT Roorkee, Knowledge Park-II, Greater Noida

On August 09, 2019 IITD-AIA Foundation for Smart manufacturing (FSM) in collaboration with FICCI and IIOT India conducted an Awareness program on Industry 4.0|SAMARTH Udyog Bharat 4.0 - an initiative of Department of Heavy Industry (DHI), Ministry of HI & PE, Government of India.

The event primarily focused to be a holistic perspective for manufacturing industries, to embark on the journey of Industry 4.0| SAMARTH Udyog and an assessment of concerned company readiness for Industry 4.0|SAMARTH Udyog. The Program was **attended by 51 concerned delegates** from relevant companies & academia who attended a range of sessions conducted by professionals of the industry addressing the problems arising in the field of manufacturing along with the applications of IIoT in manufacturing Industry. During this event, the attendees shared their suggestions & queries regarding the implementation of Industry 4.0|SAMARTH Udyog in an effective manner.

The Awareness program witnessed decision makers from relevant companies, Technical Advisors & academicians from prestigious Institutes coming together in synergy. The Program Speakers enlightened about the opportunities for OEMs, relevance for business owners, transformation of IT to OT and discussed various case studies relevant to Indian manufacturing & future course for Industry 4.0|SAMARTH Udyog.

A live survey with the participants present was conducted. The participants in the Awareness program on Industry 4.0 had an opportunity to assimilate ideas and experience from Industry experts. Moreover, participants could avail suggestions and could address their queries.

ANNEXURE-III

LIST OF SPEAKERS

Department of Heavy Industry
Government of India

FSM
Smart Manufacturing Simplified

AWARENESS PROGRAMME ON INDUSTRY 4.0

The Indian Perspective

Date: Friday, 9th August, 2019

Venue: GNEC-IIT Roorkee, 20, Knowledge Park II, Greater Noida

Timing: 10:00 AM to 04:00 PM

CONNECTING INDUSTRY TO THE REAL POTENTIAL OF SMART MANUFACTURING

SPEAKERS

Prof. Sunil Jha
Professor, IIT Delhi
Director, IAFSM

Mr. Ravi Agarwal
Managing Director
Pepperl -Fuchs FAPL

Mr. Dilip Sawhney
Managing Director
Rockwell Automation

Mr. Anup Wadhwa
Director
Automation Industry Association

Mr. Saroop Chand
Director
Adroitec Information
Systems Pvt. Ltd.

Mr. Baldeep Singh
Country Head
Singex Exhibitions

Mr. Tushar Ghosh
Technical Manager -North & East
PTC

Mr. Aashutosh Varma
Customer Solution Advisor
India Region
Nokia

Mr. Kaushik Saha
CTO
Samsung R&D

KEY TOPICS INCLUDED

- Opportunities for OEMs and their Supply Chain (Keynote)
- Industry 4.0 relevance for Business Owner / CXO and ROI Concerns
- Bridging the divide between Machines and IT - Case Study of Cyber Physical Assembly Line
- Implementing Smart In-line Inspection Systems (Indian Case Study #1)
- Preparing your Enterprise for Digital Connectivity (Indian Case Study #2)
- IIoT India: Reimagining the Future
- Assessment of Company Readiness for Industry 4.0
- Plant Monitoring Systems (Case Study #3)

WHY ATTEND?

- To equip yourself for the next big change in manufacturing.
- Get exposed to a global, all-encompassing outlook of the industry 4.0 world at this roadshow.
- An opportunity to interact, learn, share ideas and network with experts and industry leaders of the country.
- Explore and gather insights on investment opportunities in Smart Manufacturing.
- Discover end-to-end solutions that will help you optimize operations, reduce downtime and maximize profitability.

REGISTER NOW

Event Partners

FICCI

AIA AUTOMATION INDUSTRY ASSOCIATION

IIT ROORKEE ITR ALUMNI ASSOCIATION

IIoTINDIA

For More Details Contact :

Naman Kapoor | email: nkapoor@iafsm.in | Mob: 9990601814, 8076197190

LIST OF SPEAKERS

SNo	Name	Designation	Organization	Email
1	Prof. Sunil Jha	Professor & Director	IIT Delhi & IAFSM	suniljha@iafsm.in
2	Mr. Ravi Agarwal	Managing Director	Pepperl-Fuchs FAPL	ragarwal@sg.pepperl-fuchs.com
3	Mr. Dileep Sawhney	Managing Director	Rockwell Automation	dsawhney@ra.rockwell.com
4	Mr. Anup Wadhwa	Director	Automation Industry Association	director@aia-india.org
5	Mr. Saroop Chand	Director	Adroitec Information Systems Pvt. Ltd.	saroop.chand@adroitecinfo.com
6	Mr. Baldeep Singh	Country Head	Singex Exhibitions	baldeep.singh@singex.com
7	Mr. Tushar Ghosh	Technical Manager	PTC Inc.	tughosh@ptc.com
8	Mr. Aashutosh Verma	Customer Solution Advisor-India Region	Nokia	aashutosh.varma@nokia.com
9	Dr. Kaushik Saha	CTO	Samsung	kaushik.s14@samsung.com

ANNEXURE-IV

PHOTOGRAPHS

ANNEXURE-V

PRESENTATIONS

PEPPERL+FUCHS

Opportunities for the Indian Ecosystem

Samarth Udyog

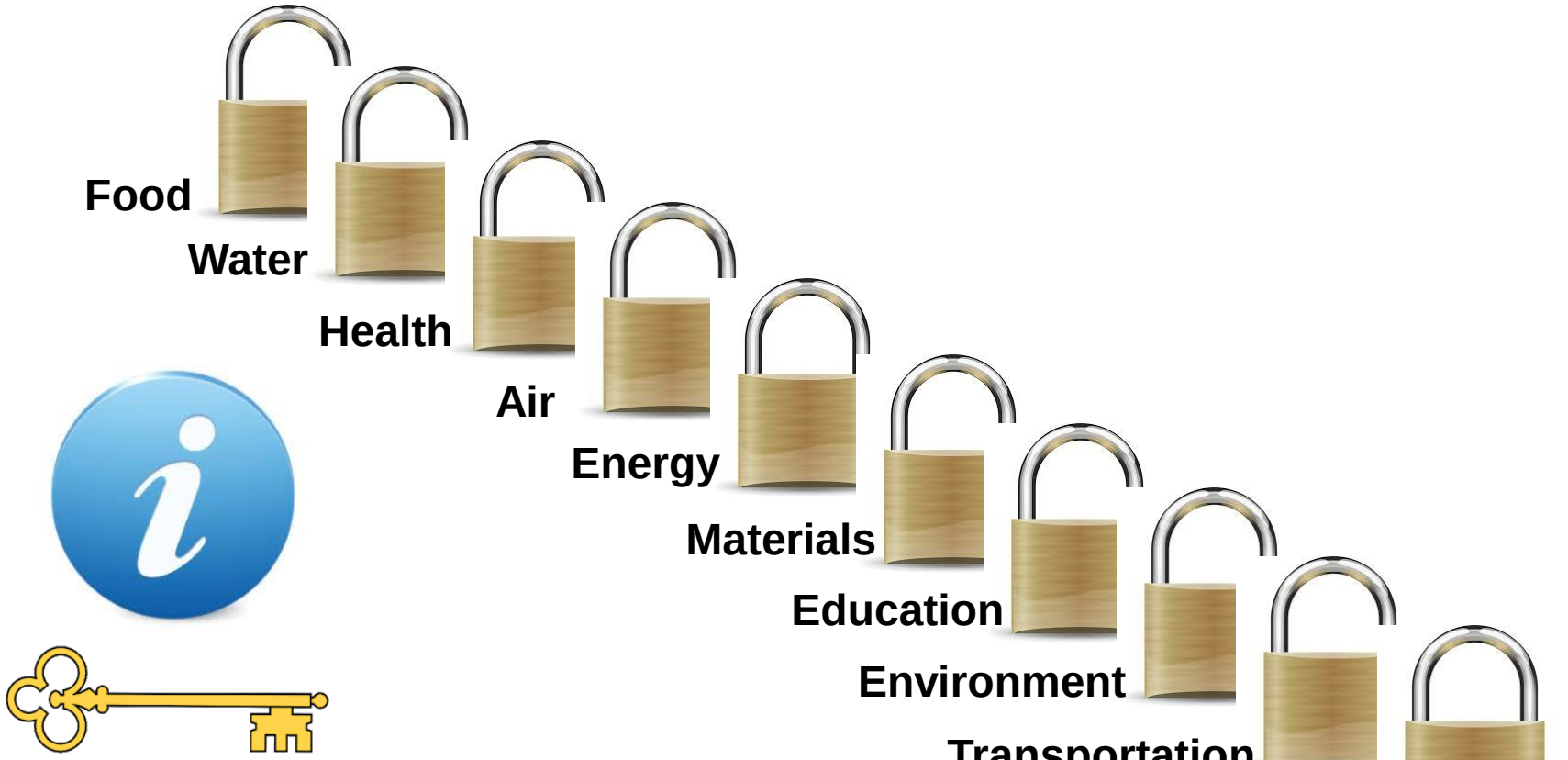
Smart Manufacturing in India

Ravi Agarwal

MD, P+F FA

9th Aug 2019

Unlocking the Industrial potential ?



Information is now available, fast and democratized = Digital

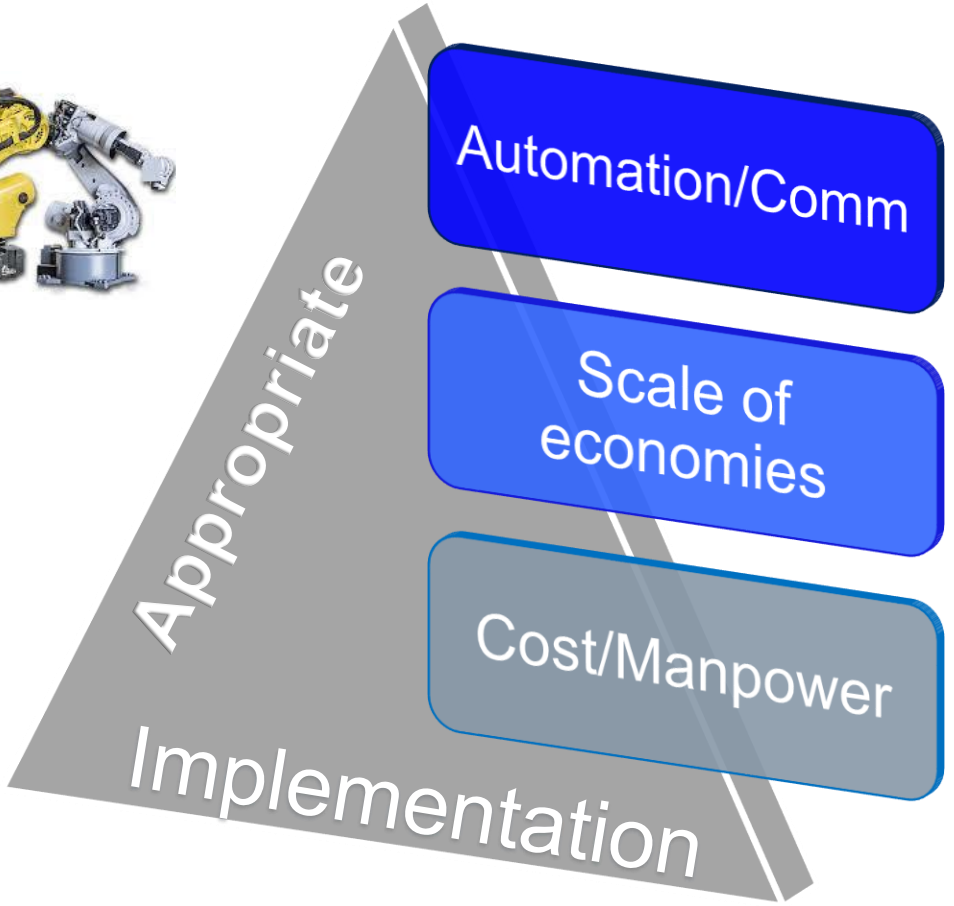
Why Automation / Digitization / I4.0 ?

- Ease of use
- Better quality control
- Increased safety
- Increased productivity
- Improved design through simulation (CAD/CAM)
- To reduce labor cost / On Shoring
- To mitigate the effects of labor shortages
- To reduce or remove routine manual and clerical tasks

- To accomplish what cannot be done manually
- To reduce manufacturing lead time
- To increase labor productivity
- To improve product quality
- Energy saving

Replicate solutions elsewhere ?

Cut
Copy
Paste
Wouldn't work !
Inspiration &
Ingenuity would !



PEPPERL+FUCHS

Indian manufacturing I4.0 SWOT Analysis

- Relatively Young
- Big domestic market
- Capacity expansion plans
- Increasingly Educated
- Networked – Up downstream
- Local ecosystem
- Eager, Talented
- Highly capable hybrids

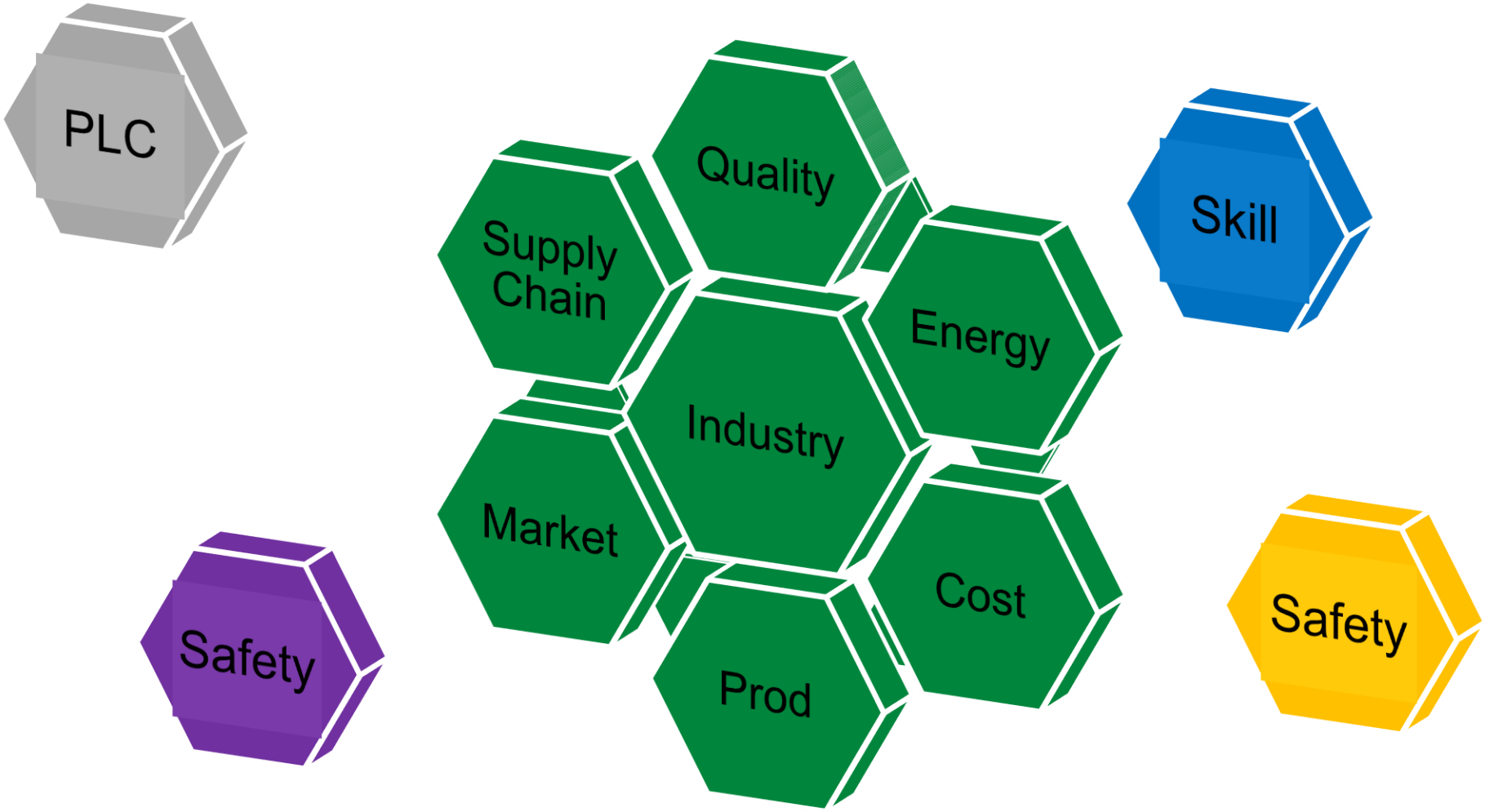
- Infrastructure
- Slow scaling
- Cash economy and transparency
- Lower skill levels
- Cost competitiveness
- Weaker scale of economies
- Unstable currency
- Lower through put efficiency
- Energy deficiency

- New sunrise
- Play on strength
- Known IT Prowess
- High permeation of data
- Bridges deficient infra
- Strengthens service of D market
- Higher participation in global economy

- Tardy awareness & action
- Reverse ballistics
- Data infrastructure
- Security of data
- Key hardware imported
- Speed and quality of skilling
- Quality and content of right education

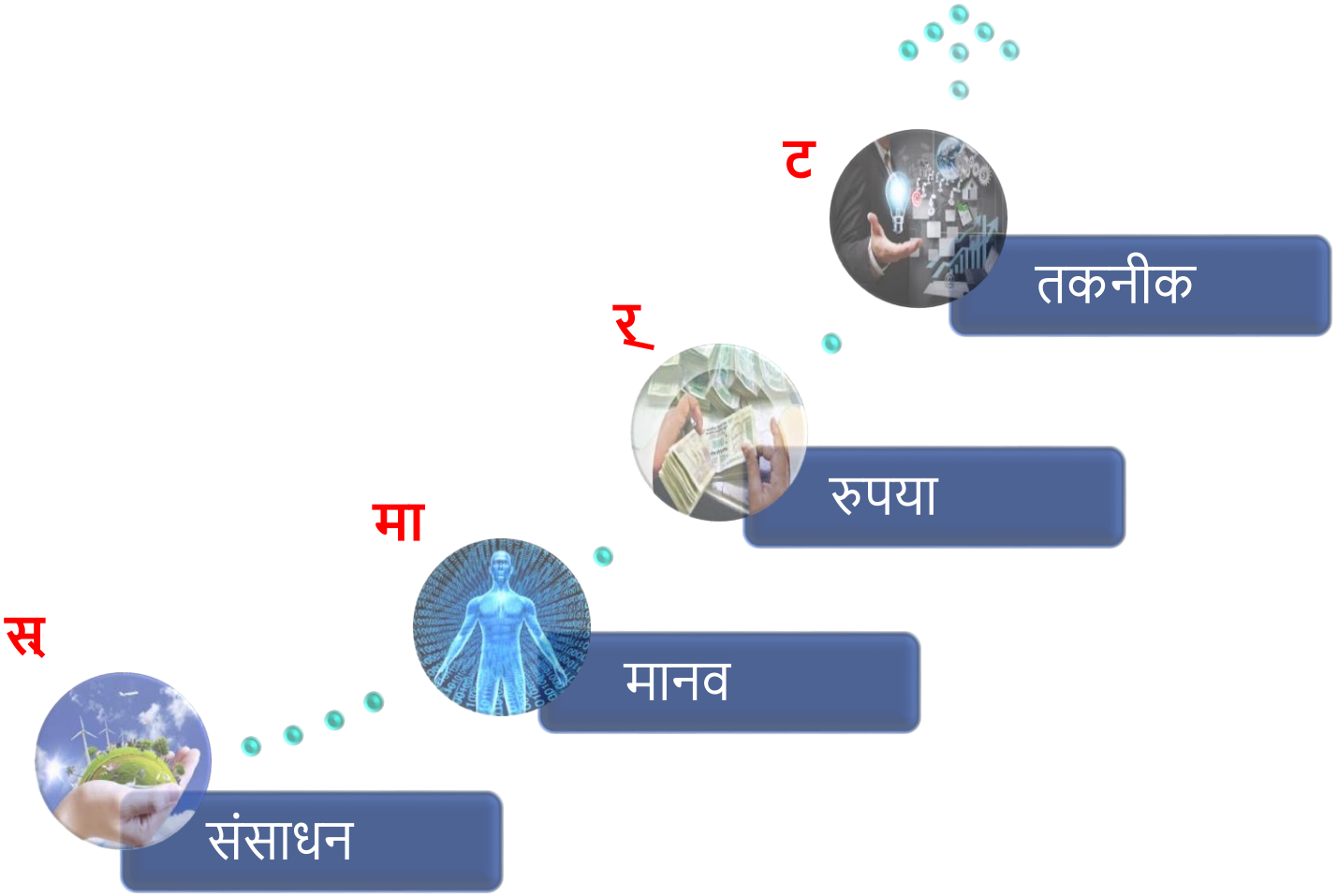
PEPPERL+FUCHS

Information driven manufacturing



The Indian Context

स्मार्ट Manufacturing – A balancing Act



Defining Problem – Half the solution

Resources (संसाधन)

- Minimise Leakage/Wastage
- Optimise
- Matching Raw material Sources-Production capacity/capability-Market
- Demand & Supply – Land/Electricity/Housing/Mobility/Agri Produce
- Circumventing weak infra

Defining Problem – Half the solution

Human Resources

(मानव)

- Deal with the Surplus
- IT Prowess
- Skill and Training
- E services – Doctor, Engr, Education
- Give Jobs / Increase Employment Opportunities
- Stop Migration
- Decentralise Production

Defining Problem – Half the solution

Finance/Cost (रुपया)

- E Auction/Sugam/ITR
- Cost of Non Smart too high
- Better Cost : Revenue
- Risk Mitigation
- Access to Capital
- New Genre of Business – High Liquidity

Defining Problem – Half the solution

Technology
(तकनीक)

- Jump Generational learning/cycle
- Higher absorption and Pliability/Acceptance
- Cyberway – Democratization of Technology
- Big brother – Market or Technology
- Enabler

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It is about “How” not “Why”

PEPPERL+FUCHS

Technologies

IIoT

RFID

Augmented Reality for Enhanced Visualisation & Learning

Cyber Physical System

Computer Vision

3D Printing with Multi-material capability

Collaborative Robots (Cobots)

Manual Operating Station

Smart Sensors

Safety

Network Security

Implementation of OPC-UA

MTConnect Agent based Services

Pallet & different conveying system

Manufacturing Execution System

Manufacturing Analytics

Grippers & Material Handling

PEPPERL+FUCHS

Implementation of Samarth Udyog

Thank You !

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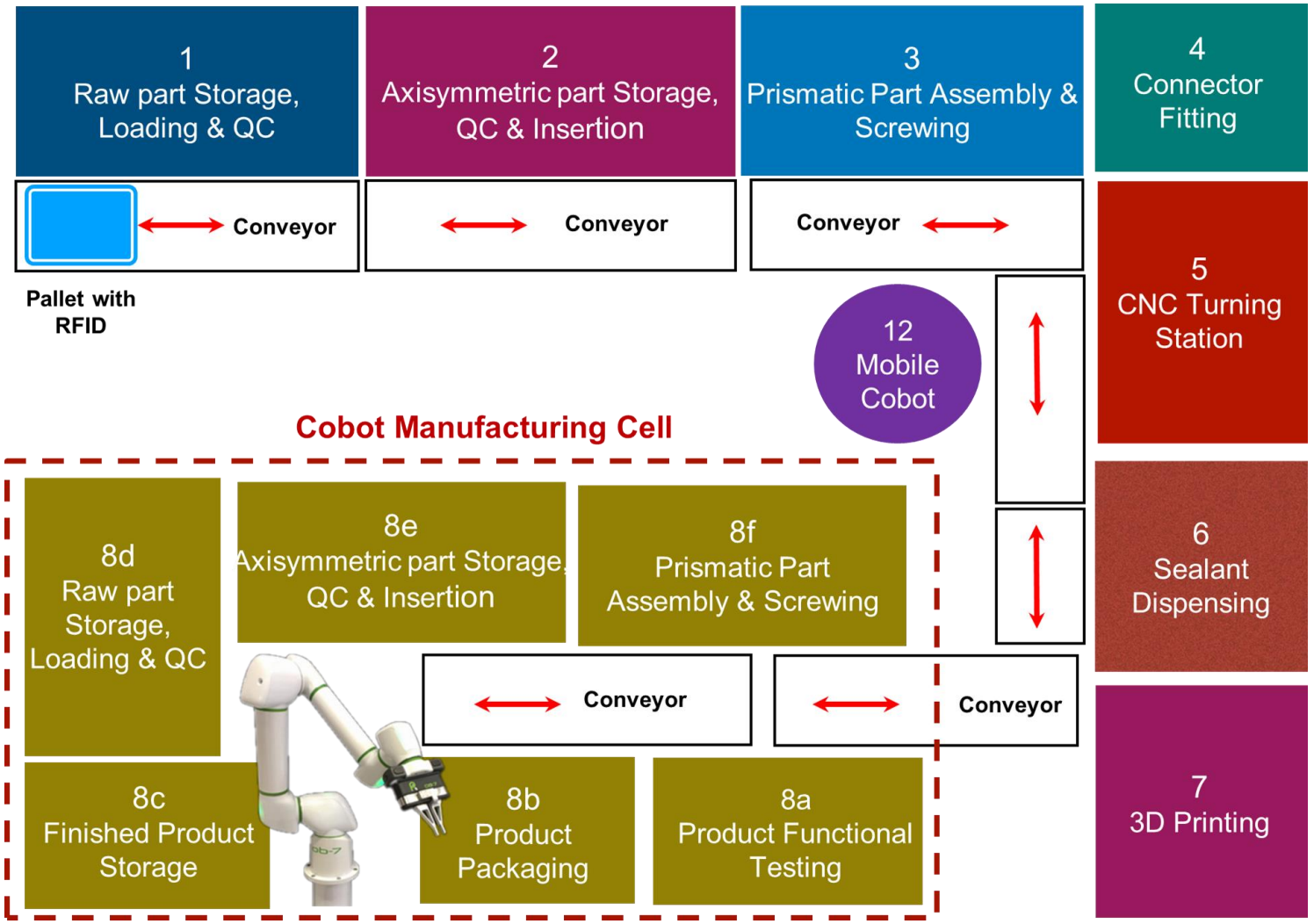
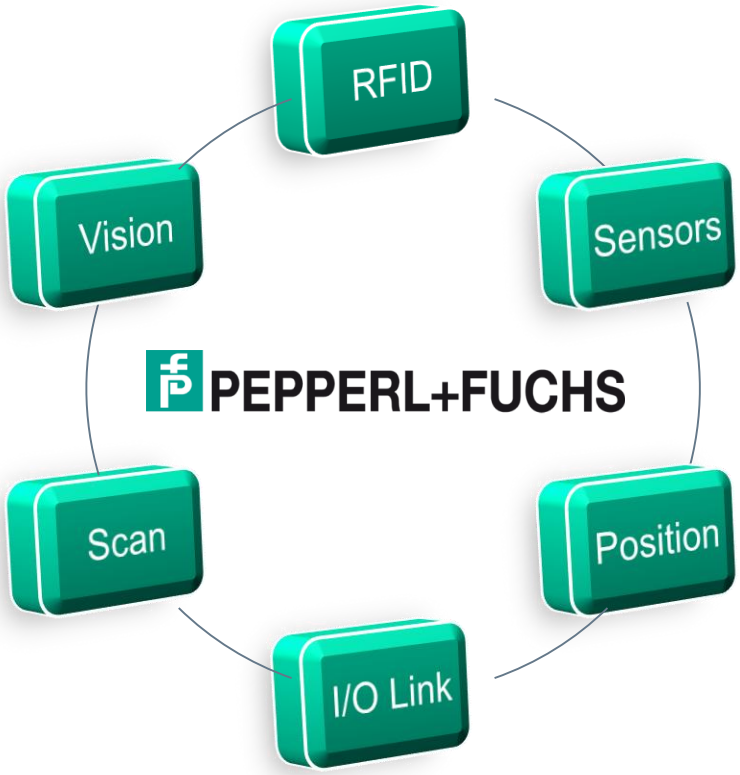
Cyber Physical Lab



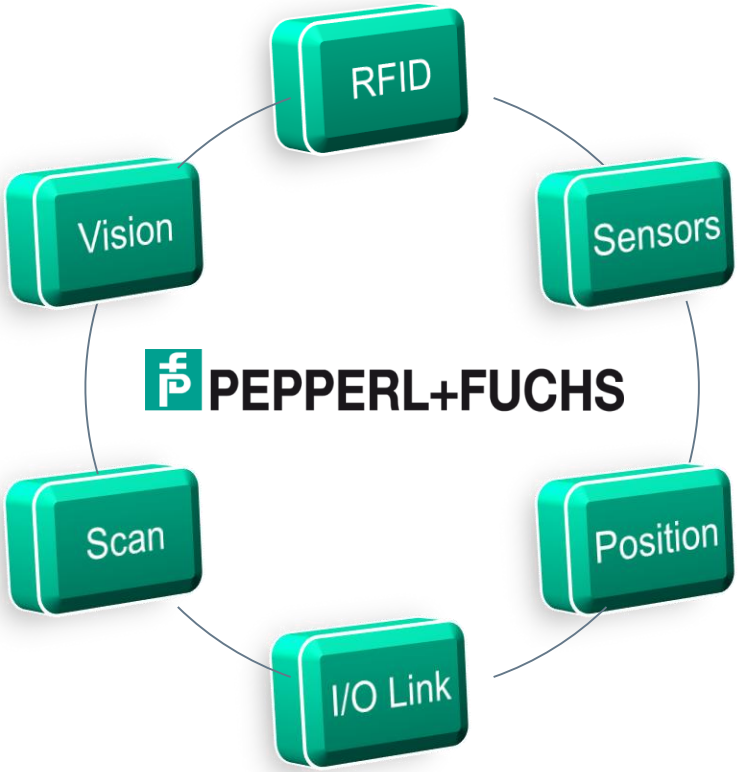
Production

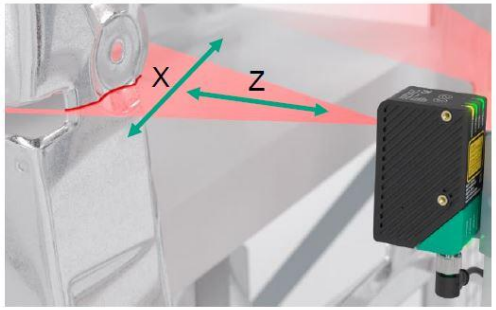
- Data collection and collation
- Resources consumed and through put
- Asset Utilization
- Demand Driven
- Resource Driven
- Waste cut
- Raw material and finished goods
- Reduction of downtime
- Cross expertise on shop floor



Quality

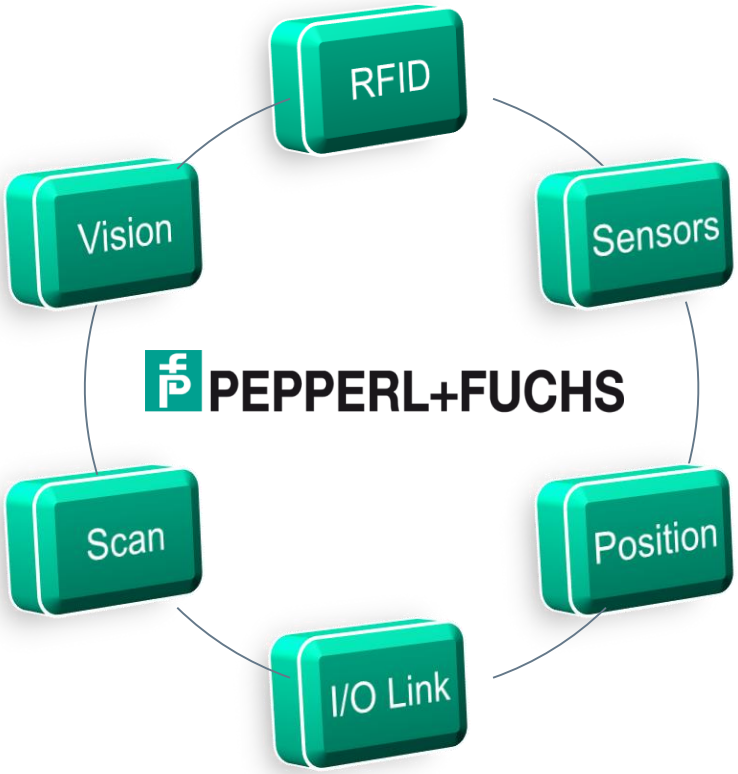
- Block chain and Genealogy
- Quick collation from end chain and correction
- Raw material inspection
- Inventory control
- Grading and pricing
- Authentication against duplication

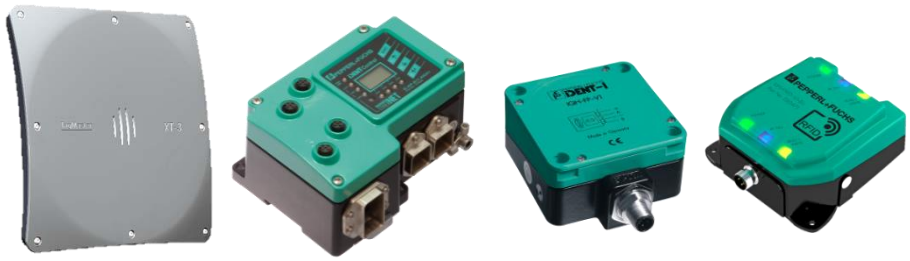




Legacy, Asset Utilization

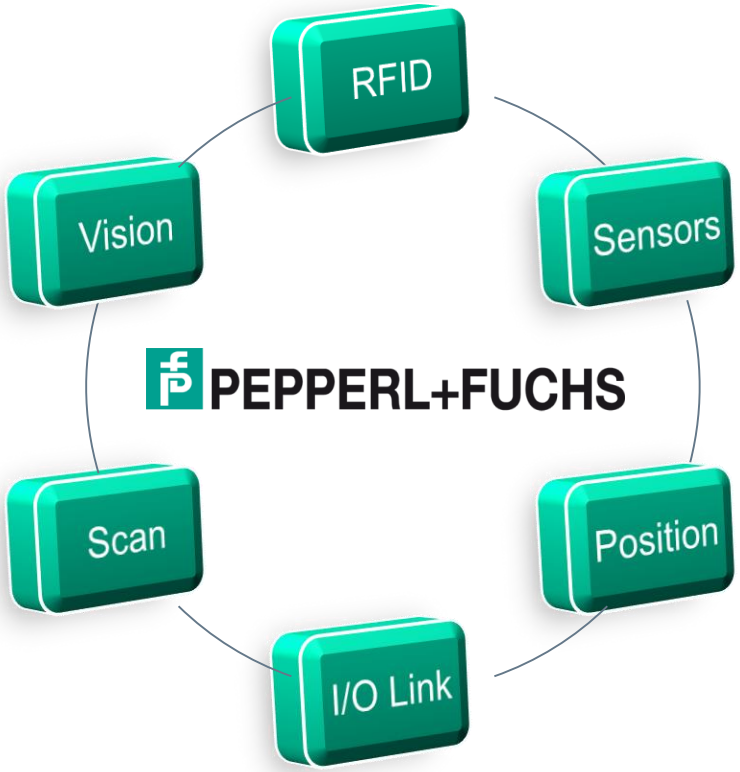
- Data collection
- Energy optimization
- De bottlenecking
- Cycle times and through put
- Analysis
- Resource spread through Multilayer MIS





Supply chain

- Track and trace
- Aging
- ASRS
- Packaging
- Positioning
- Human interface
- Speed and safety

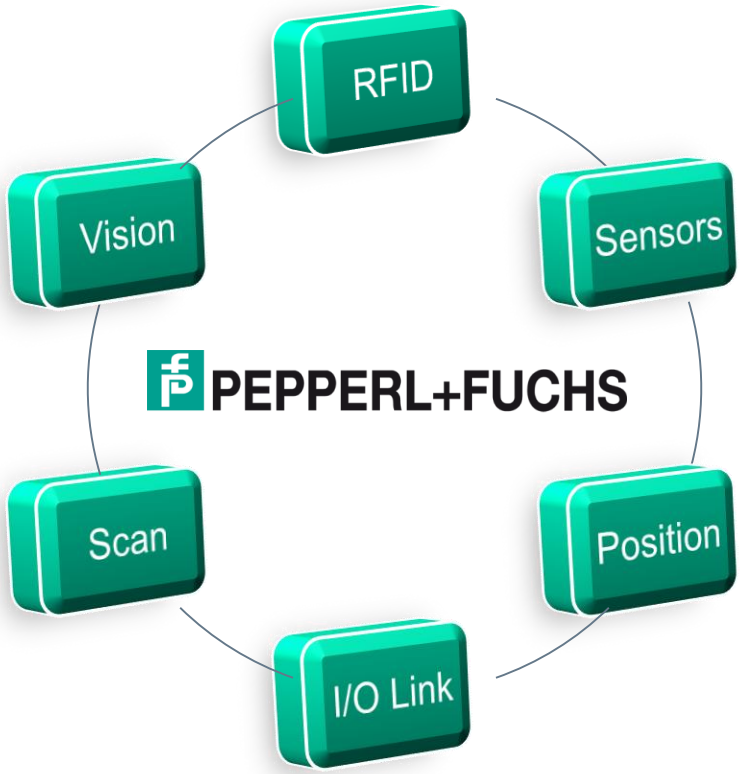


MIS

- ERP
- Cloud
- OT
- Dashboard
- Making the interpretation
- Software to make it comprehensible

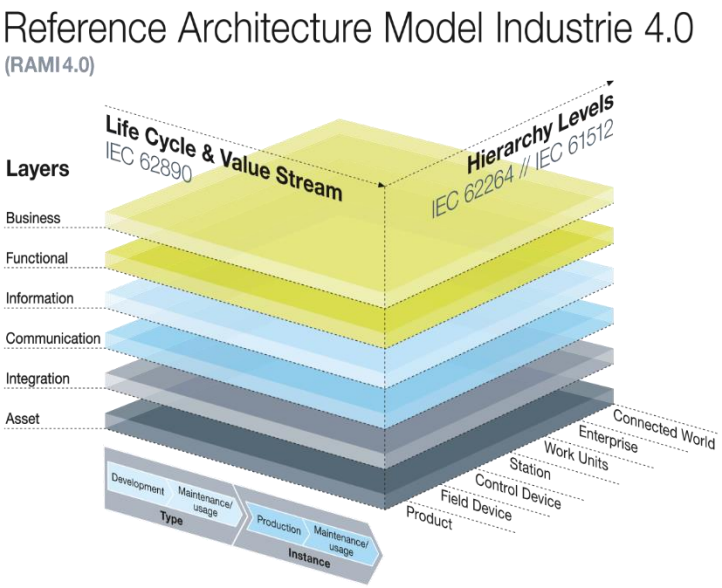
WLAN

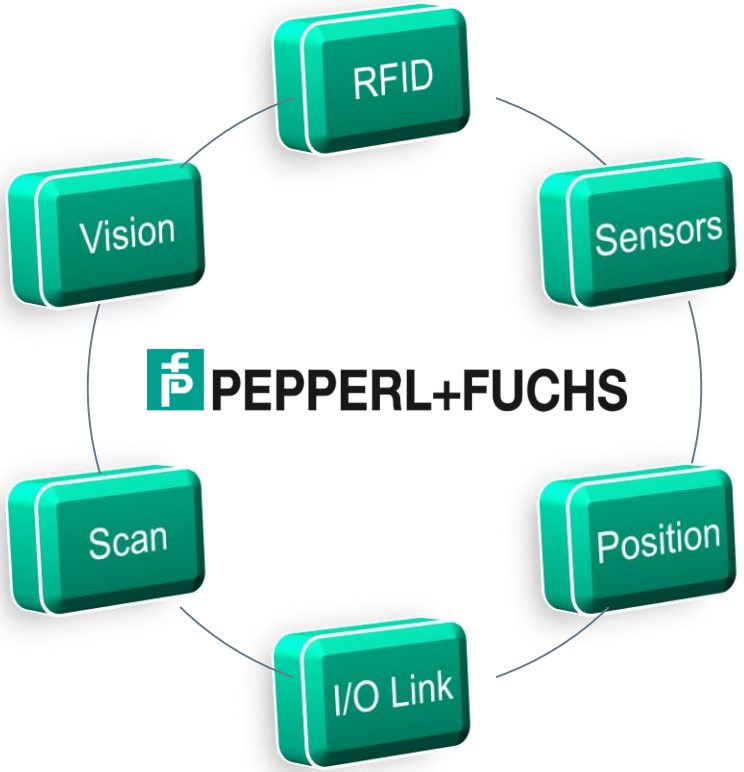
-



Education, Employment, IIT 2.0, Tech Dev

- Favorable demographics (unfavorable system and content)
- High potential , Green shoots aplenty
- Leapfrog weakness in education infra to create workforce
- Indian IT 2.0
- Lead IT and OT marriage
- Implementation Army





Forging the path for Nokia Enterprise

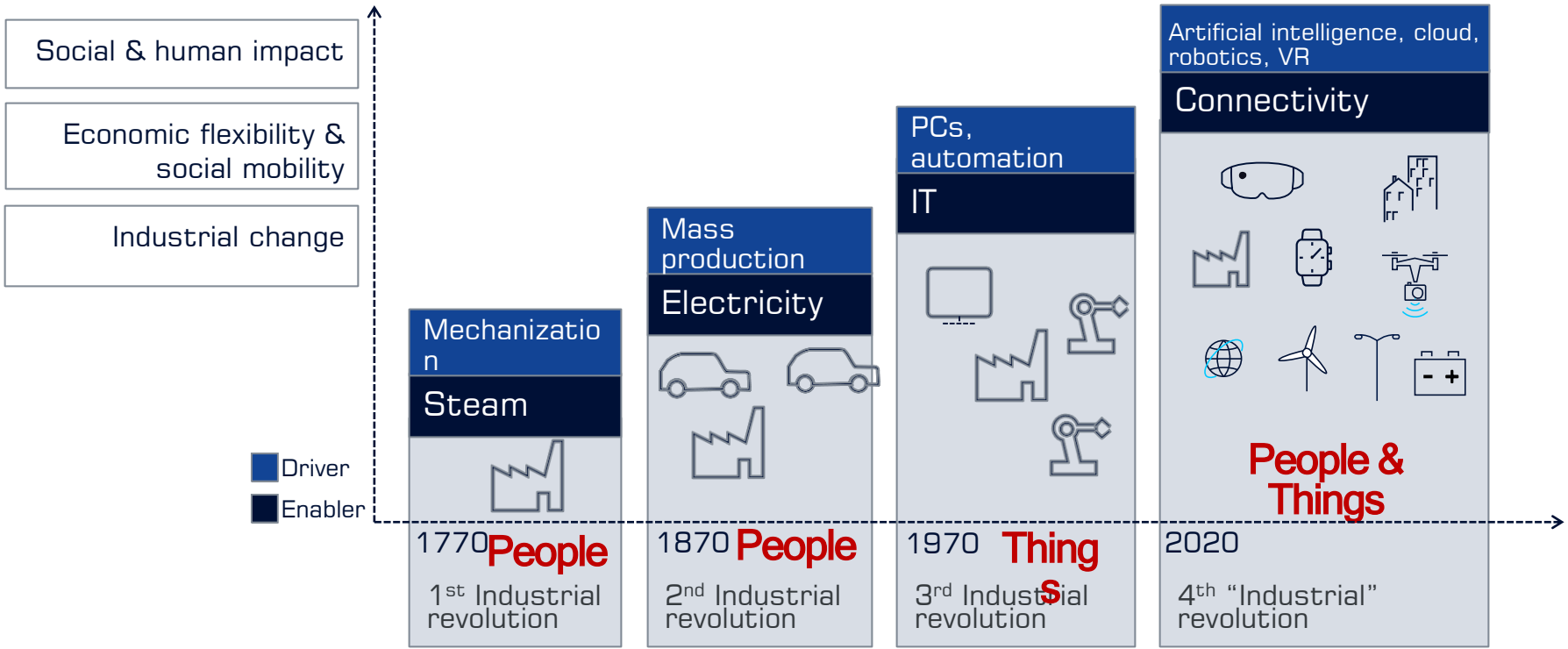
Aashutosh Varma

CSA, Emerging Business

NOKIA NETWORKS

4th “industrial” revolution powered by Connectivity

Through the revolutions “Innovation and Technology” is the Bearer



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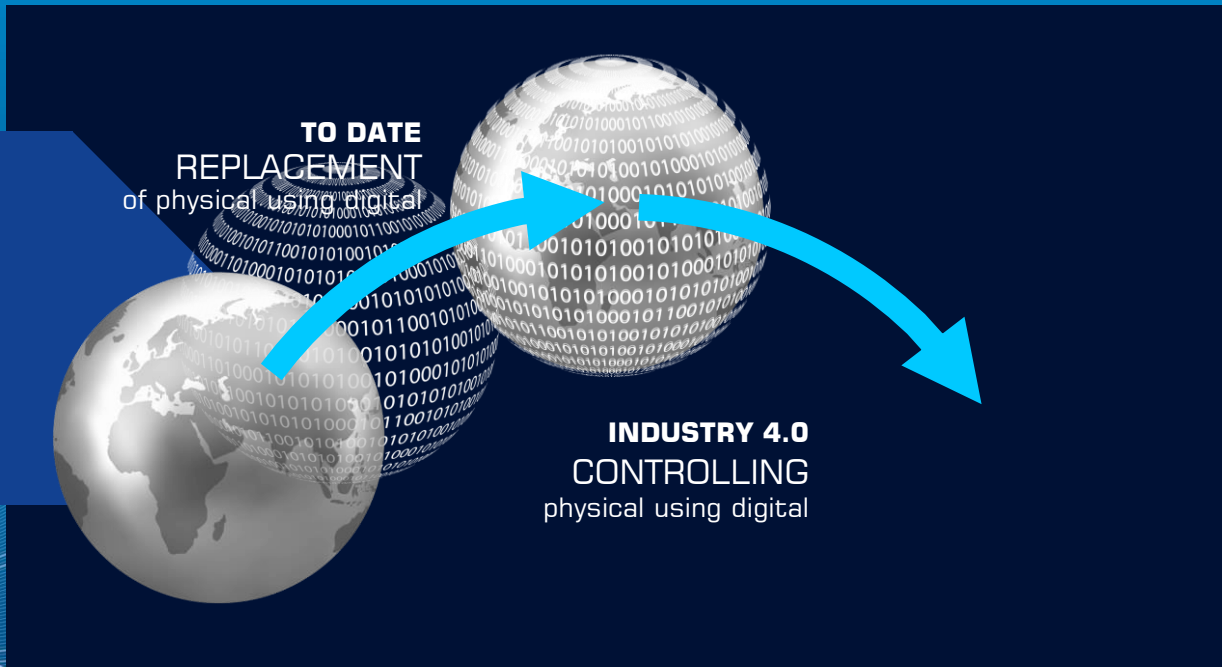
THE JOURNEY TO INDUSTRY 4.0



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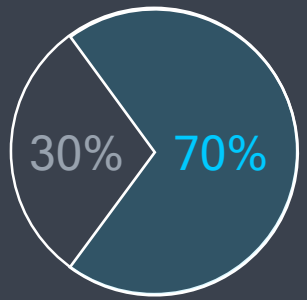
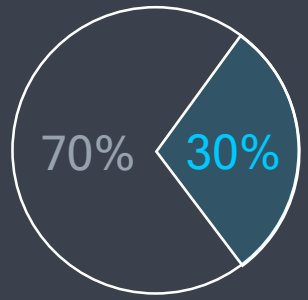
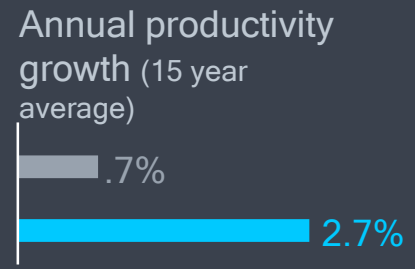
The imperative
A tale of two industries







Physical industries

Digital industries

Taking benefits from the few to the many unlocks massive opportunity

$3.8T to $11T

Economic value of IoT (by 2025)

up to 11%

of global economy (in 2025)

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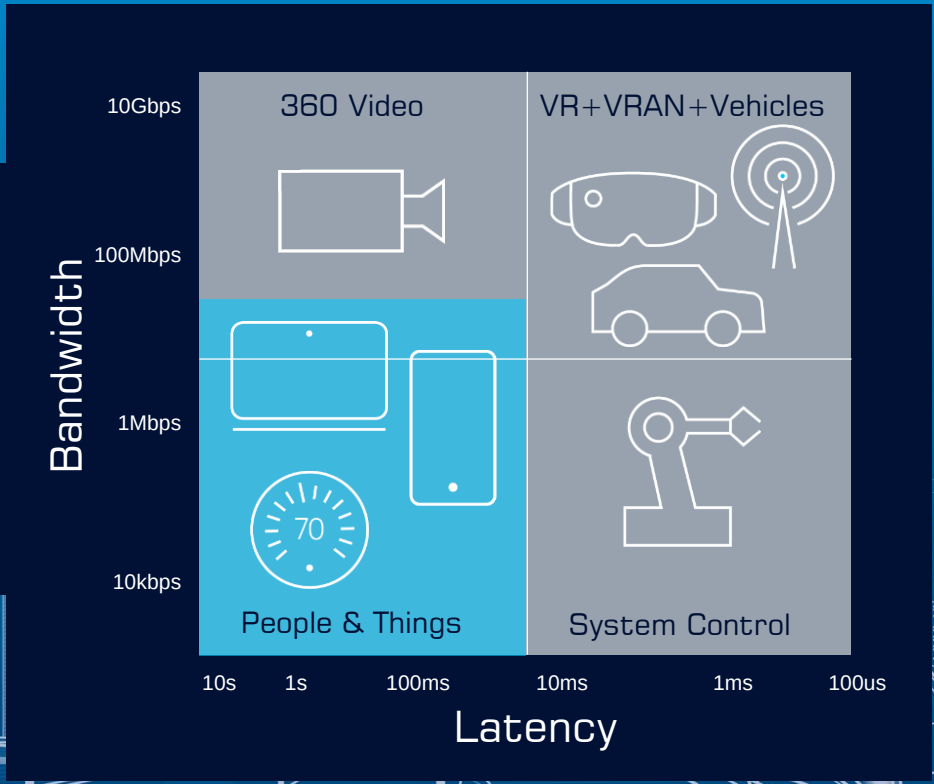
What's different with Industry 4.0 Connectivity?

Expanding scope of business-critical applications

To unlock it, we must become adept at controlling the physical with digital means: go beyond physical-to-digital transformation



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Industrial Automation
Success Factors

Reliability

Localization

Easy integration

Modularity

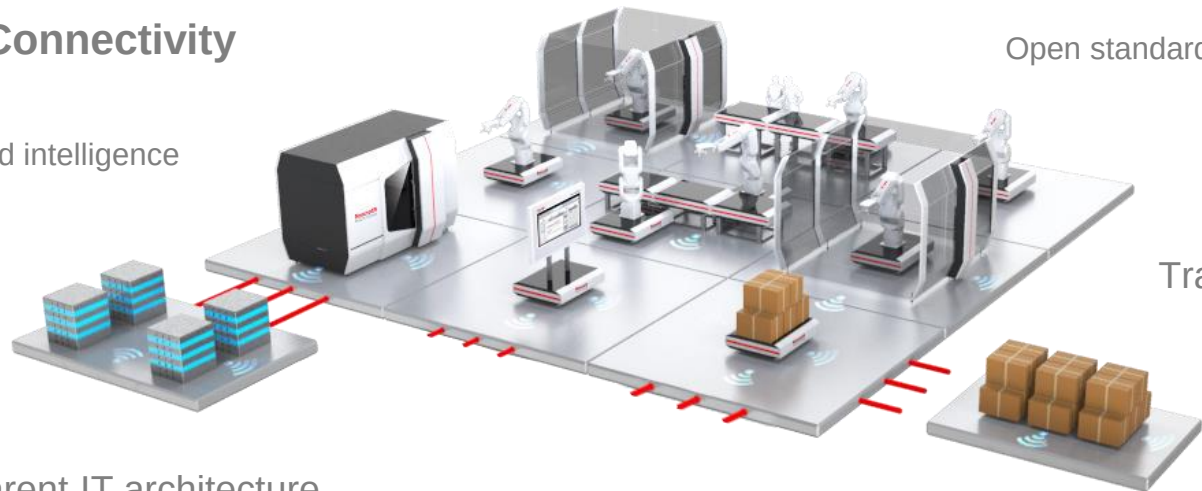
Cable-free

Security

Flexible transport

Connectivity

Open standards



Distributed intelligence

Additive manufacturing

Transparency

Transparent IT architecture

Software services

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The value chain can be split into 7 key components

Physical using Digital Value Chain for Industry 4.0

Machines/ Devices	Network	Platforms IT infra	Applications	Solutions	Operations	Project management
Ecosystem based approach Leveraging on existing deployment	Multi-Access Network management. Propose best fit technology	Interface Enablers Platform to nurture ubiquitous approach	Industry specific use case Machine learning and Analytics	Business case creation Solution design & delivery	Project implementation and Support Maintain Network and applications uptime, periodic upgrades for security and operations improvements	

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NOKIA & BSNL Initiative – Collaboration for Industry 4.0

NOKIA Chennai Factory

BSNL

NOKIA

- Moving from traditional wired factory network to wireless network
- Improve equipment mobility for enhanced flexibility of manufacturing infrastructure
- Create a platform for early adoption of IIOT applications in industries
- Productivity and Operational Efficiency improvements

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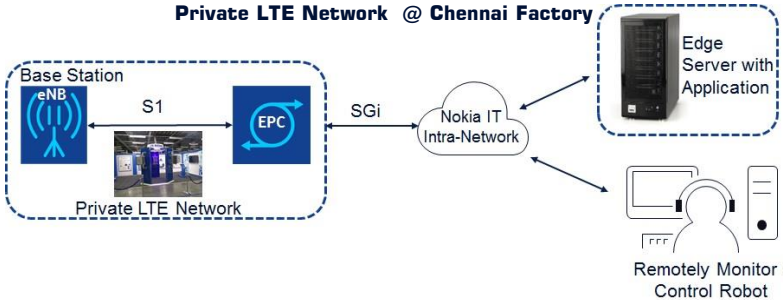
NOKIA Chennai Factory – Private LTE Network for Industry 4.0

Private LTE Network @ Chennai Factory



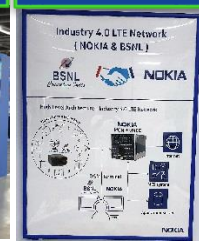
Private LTE Applications @Chennai Factory

1) Tester and Machine connectivity	2) AGV Tracking and monitoring	3) UR5 Robot connectivity using LTE	4) SMART screw driver connectivity using LTE	5) Telepresence Robots connection
				
6) NOKIA 3rd Eye (AR for Test Engineers)	**7) SMT IoT (MPM consumables usage status monitoring)**	**8) AR Enabled operator guidance**	**9) Voice over LTE (VoLTE)**	**10) Push to Talk/Push to Video**
				

Private LTE Network Journey @ Chennai Factory

Industry 4.0 – Nokia's 1st LTE Network : Global Benchmark

BSNL Collaboration



LTE RAN BB - Terminal

LTE Network - Inauguration

BSNL Unit

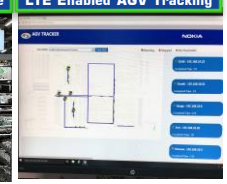
MoU Sign Off – BSNL + NOKIA

Nokia's 1st LTE Enabled Galaxy RFM Line

LTE Enabled AIV

LTE Enabled AR Guidance

LTE Enabled AGV Tracking



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Connectivity Paving the way for Enabler Industry 4.0

Automotive

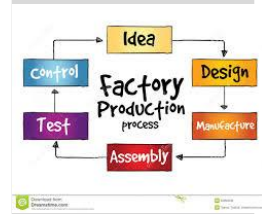
Oil & Gas

Banking & Finance

Information Technology

Power

Production



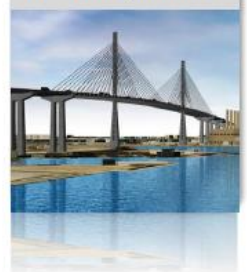
Verticals Suitable for adopting private LTE

Media

Real Estate

Healthcare

Project Development



Trading

Aviation

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NOKIA

Changing landscape for OEMs and Supply Chains… *How Indian industrial companies can capitalize on digital transformation*

Dilip Sawhney, Managing Director, Rockwell Automation India

9 Aug 2019

Rockwell Automation

Agenda

1 Smart Manufacturing

2 Our own experience as a manufacturer

3 Digital transformation roadblocks

4 Closing thoughts

Rockwell Automation **at a glance**

Our strategy is to bring The Connected Enterprise to life.
We integrate control and information across the enterprise to help industrial companies and their people be more productive.

$6.7B	23,000	80+
FISCAL 2018 SALES	EMPLOYEES	COUNTRIES

ABOVE-MARKET GROWTH | PRODUCTIVITY | INTELLECTUAL CAPITAL > VALUE CREATION

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"Our PEOPLE are the foundation of all we do, and creating an environment where everyone can do their best work is fundamental to our success."

Blake Moret
President and Chief Executive Officer

Innovation

Forbes The World's Most Innovative Companies
Top 100 Innovative Companies

THOMSON REUTERS
Top 100 Global Innovators

BUSINESS INSIDER
One of 25 Best Tech Companies to Work for in America

CISCO
2016 Acceleration and Transformation Award

THE STEVIE AWARDS The worlds Most Premier Busines Awards
Gold Award for Excellence in Innovation in Manufacturing

Ethics and Integrity

2018 WORLD'S MOST ETHICAL COMPANIES® WWW.ETHISPHERE.COM
World's Most Ethical Companies

BBB
Better Business Bureau International Torch Award

ABEA
American Business Ethics Award

Corporate Responsibility, Sustainability and Our People

CATALYST 2017 AWARD WINNER
Catalyst Award

swe Society of Women Engineers
Global Leadership Award

FTSE4Good
Company Index Corporate Responsibility

Dow Jones Sustainability Indexes
Most Sustainable Companies

Newsweek GREEN RANKINGS
Top 10 Newsweek Green Rankings

glassdoor
One of the Best Places to Work in the U.S.

FIRST
FIRST Robotics Competition Crown Supplier

universum
China's Top 100 Most Attractive Employer and Top Mover

PROTECTS WHAT'S GOOD Tetra Pak
Tetra Pak Best-in-Class Supplier

ASIAN MANUFACTURING AWARDS 2015
Asian Manufacturing Award Best Internet of Things Provider

BEST PLACES TO WORK 2017 for LGBT Equality 100% CORPORATE EQUALITY INDEX
Human Rights Campaign Corporate Equality Index

Rockwell Automation

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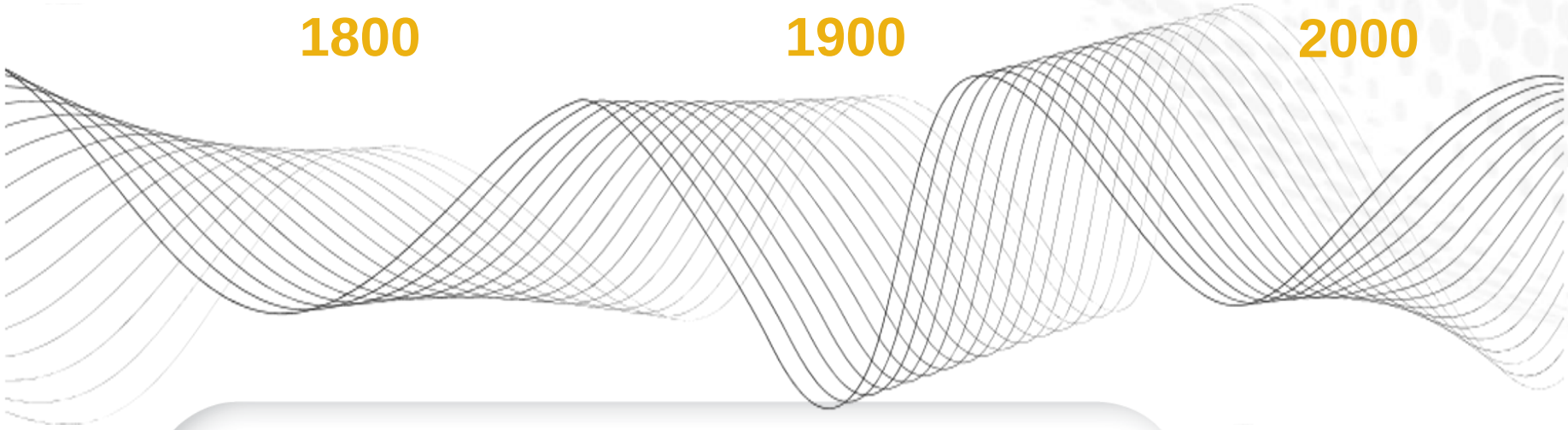
Industrial disruption is accelerating

1700 — Mechanization, Water Power

1800 — Mass Production, Electricity

1900 — Computers, Connectivity, Automation

2000 — IoT, Artificial Intelligence, Mixed Reality, Additive Mfg., Human-Machine Collaboration, Autonomous Systems



Rockwell Automation

Government Initiatives

Visions for fueling manufacturing leadership


Advanced Manufacturing Partnership 2.0


Industrie 4.0


Made in China 2025


Manufacturing Innovation 3.0


Make In India

Technologies

Innovations that redefine and create new value opportunities


IoT


Security


CPS

SMART MANUFACTURING

ENABLED BY
The Connected Enterprise

***AVAILABLE** Today and **FOUNDATIONAL** to Achieving These Visions…*

Industry Consortiums

Assemble and promote best practices

Industrial IP ADVANTAGE — CONNECT INFORM TRANSFORM

industrial internet CONSORTIUM

MESA INTERNATIONAL

SMLC

Industry Standards

Drive interoperability and commonality

ISO IEEE IEC OPC FOUNDATION ISA

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WHY ARE DIGITAL INITIATIVES IMPORTANT TO MANUFACTURING?

VALUE CREATION

$4T
Value driven by manufacturing IIoT by 2025

2X
Stock performance improvement

50%
Of companies expect IIoT to increase competitiveness

40%
Operating income improvement from digital transformations

4.0
Industry 4.0 impacts global competitiveness

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DIGITIZATION CHALLENGES
IN MANUFACTURING

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Digital transformation as a standalone strategy

Separate from the company strategy

93%

of manufacturers claim manufacturing operations are an integral component of their digital supply chain strategies

Source: *Gartner*

Yet,

71% of manufacturing digitization efforts are separate but parallel to digital supply chain initiatives

Digital transformation only makes sense if it supports your organization's overall strategy."

CIO / IDG

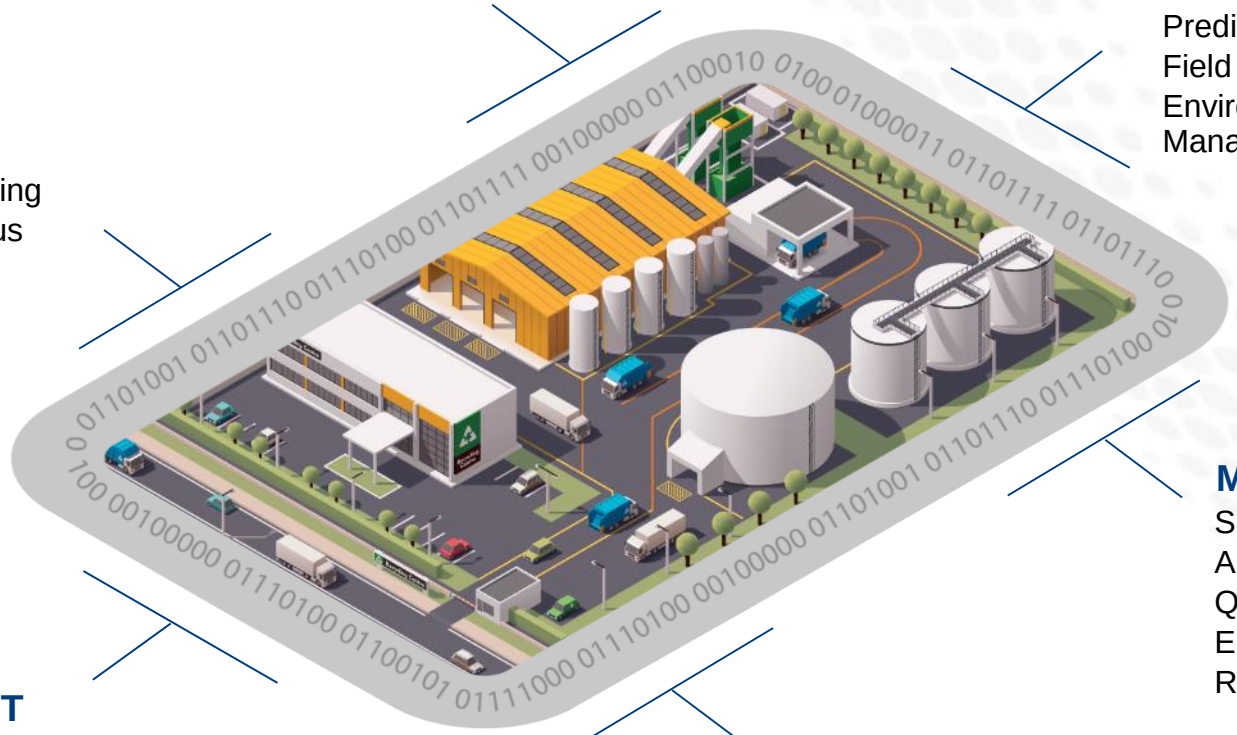
Rockwell Automation

Transformation impacts the entire value chain

Delivery and Service
Personalized customer experience
Outcome-based revenue models

Maintenance/Reliability
Asset Health Monitoring
Predictive Maintenance
Field workforce effectiveness
Environment, Health and Safety Management

Corporate/CXO
Performance benchmarking
Supply chain visibility and planning
Process Engineering, Continuous Improvement
Workforce transformation



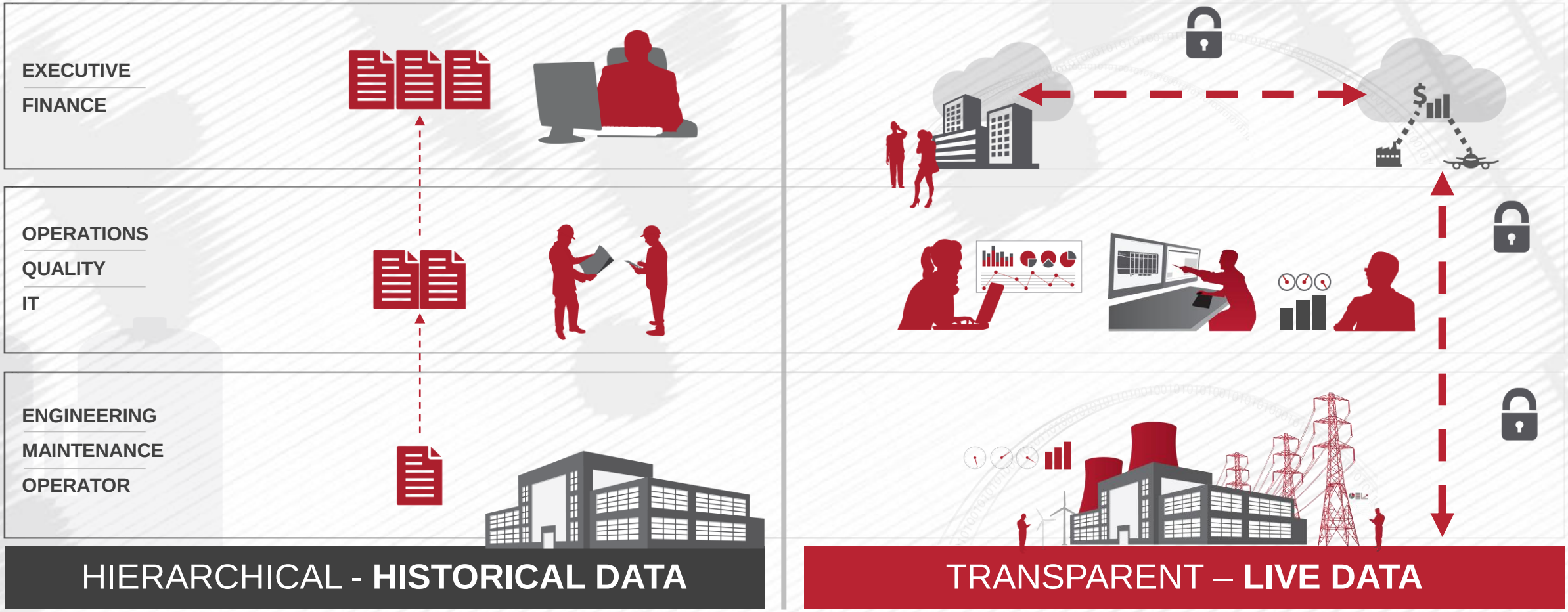
Manufacturing Operations
Shop floor workforce flexibility and efficiency
Automated, touchless factory
Quality assurance, compliance and analytics
Energy monitoring and management
Real-time operational intelligence

Plant Engineering/IT
OT/IT/Human application innovation
Integrated information and control systems
Universal connectivity
Converged IT and OT networks

Procurement
Supplier visibility, track and trace

DIGITAL Transformation

IIoT Information Infrastructure



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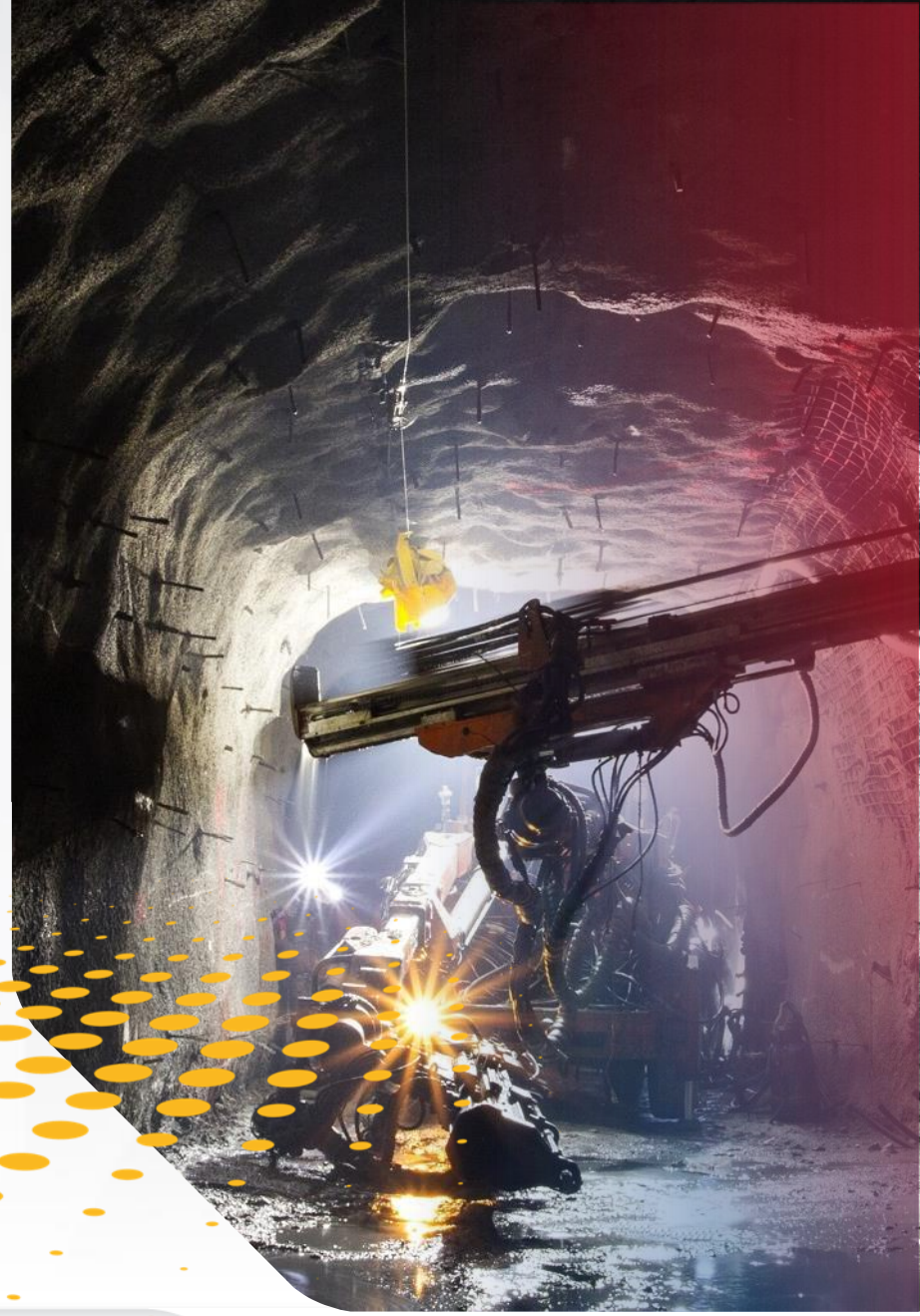
Roadblocks to digital transformation

Why digital transformation initiatives fail

By anticipating challenges before they arise, it's more likely that your digital transformation will be a success

Challenges experienced:

- Lack of understanding
- Digital transformation as a standalone strategy
- Technology-thinking instead of problems-thinking
- Workforce skills challenge
- Custom and in-house applications
- Lack of scalability
- No clear business case or return of investment
- Difficulty integrating legacy infrastructure
- Picking the wrong partner



KEYS TO A SUCCESSFUL DIGITAL TRANSFORMATION

ORGANIZATIONAL STRUCTURE	BUILD A COLLABORATIVE TEAM
INFORMATION INFRASTRUCTURE	RELIABILITY AND SECURITY
TECHNOLOGY UPGRADE	MODERNIZE FOR THE DIGITAL WORLD
EDUCATE & TRAIN	DEVELOP THE SKILLS
PARTNERSHIPS	ESSENTIAL TO CLOSE THE GAPS
CHANGE MANAGEMENT	DON'T UNDERESTIMATE THE CHALLENGES AND REWARDS

The Connected Enterprise
Implementation & Transformation

Rockwell Automation

387,000
SKUs

15
PLANTS

UP TO
200 SKUs
AVG ORDER

20 YEARS
AVG PRODUCT LIFE

PRODUCT TYPES
- *Stock + Configure to Order*
- *Engineered to Order*

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The Connected Enterprise

Rockwell Automation transformation Results

INVENTORY
120 days to
82 days

CAPEX
30% in capital
avoidance

DELIVER
82% to 96%

LEAD TIMES
Reduced 50%

QUALITY
60% reduction
in PPM

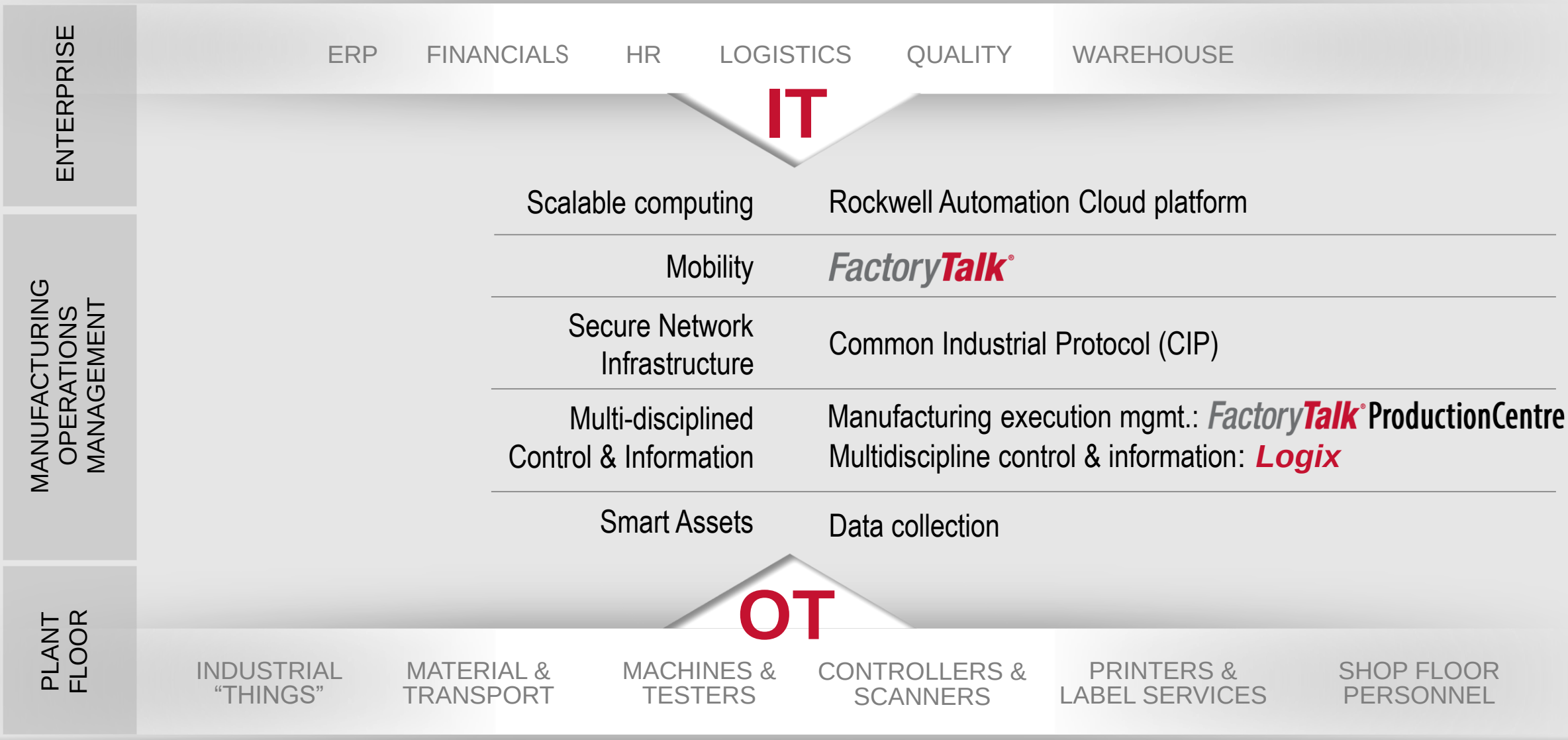
PRODUCTIVITY > 5% PER YEAR

Productivity gains offset inflation and fund investments

Rockwell Automation

The Connected Enterprise

Implementation at Rockwell Automation



Thank you!

www.rockwellautomation.com

Making Indian Industry Samarth for the VUCA world
&
4th Industrial Revolution

Anup Wadhwa
Director
Automation Industry Association

What we are used to…

Manual and partly automated Machines

Mechanized Operations

Improved productivity over Manual operations

Some process parameters controlled

Consistent Yield & Quality not predictable

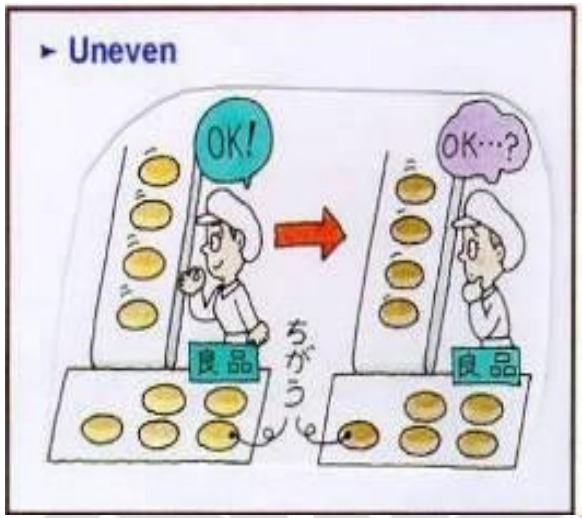
Data Analysis is not a key skill set

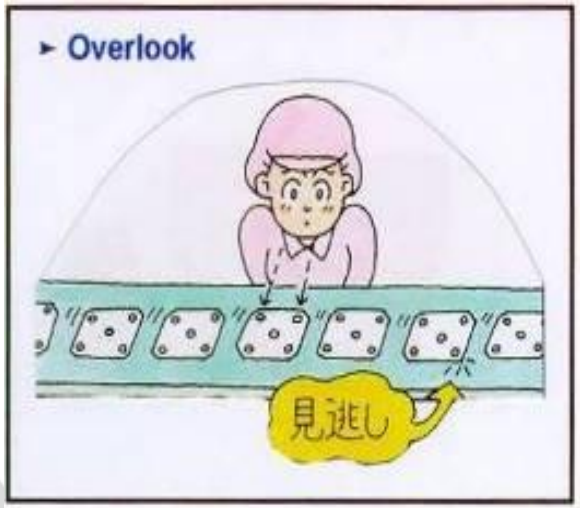
Safety standards are soft

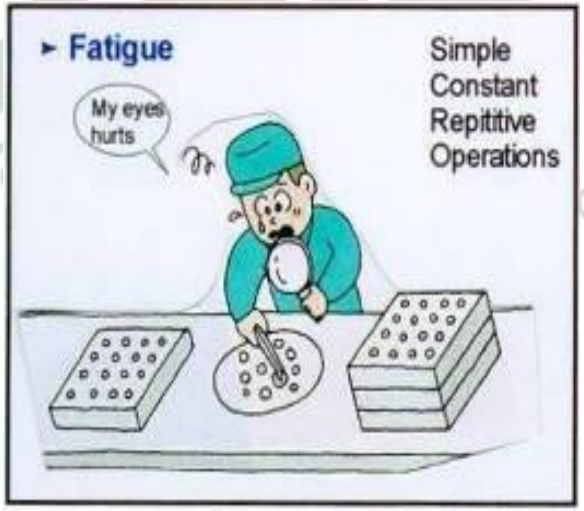
ION INDUSTRY ASSOCIATION

VOLATILE - Next Industrial Revolution

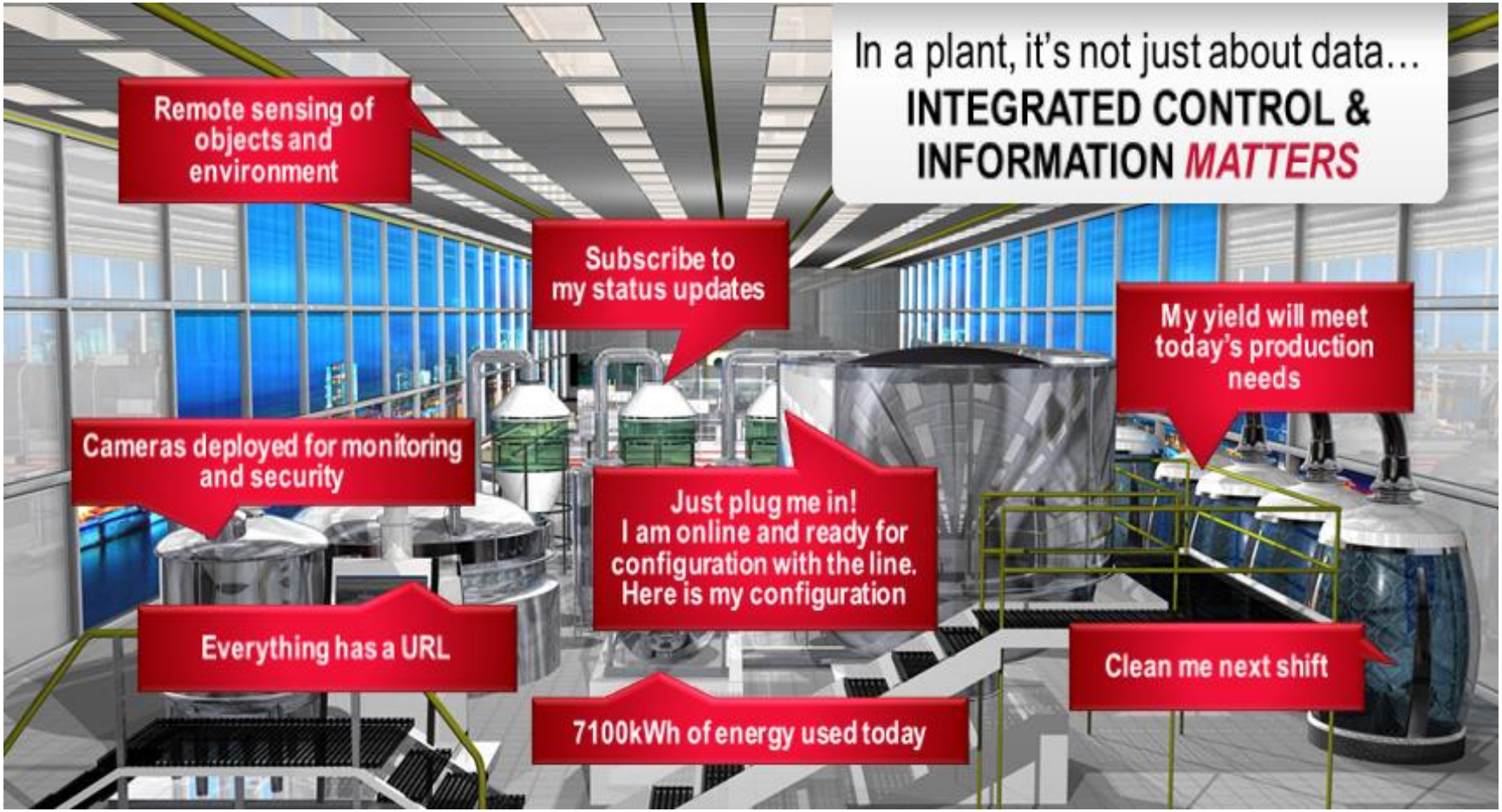
Making the old way will not sell anymore



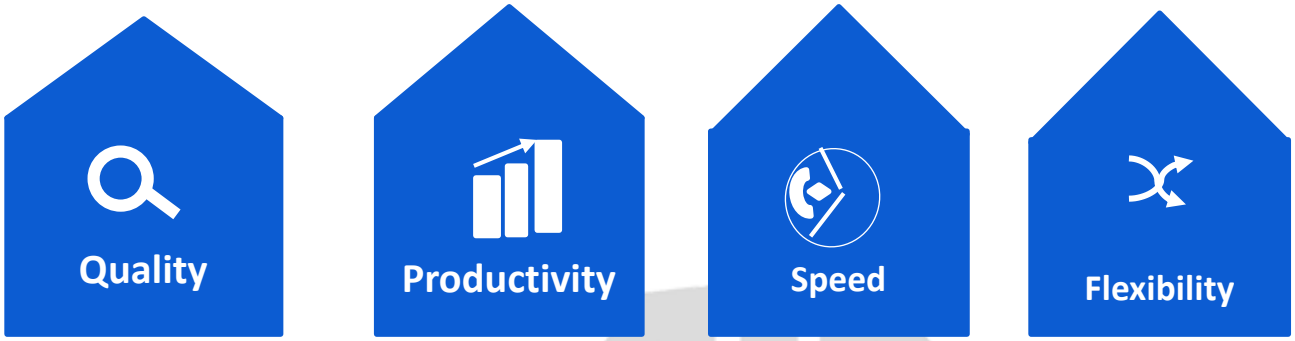




Smart Plants are Emerging



Opportunity to Transform with New Benchmarks



Next generation quality Management including closed loop control and traceability will shift the definition of quality from “compliance of specification” to customer satisfaction

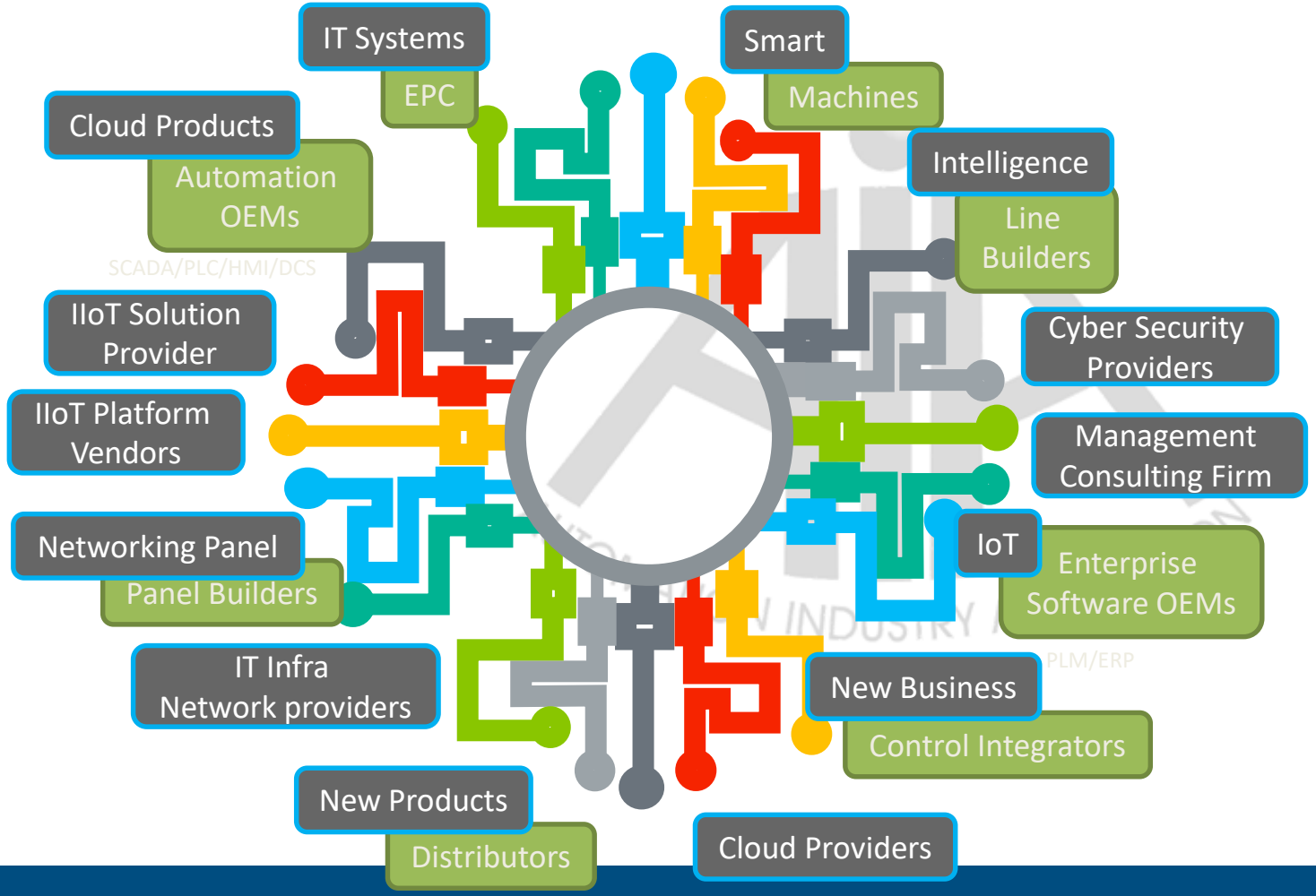
Integrating people process, technologies along the value chain pushes total productivity to next level

Shorter innovation cycles for ever more complex products cuts short “Time to Profit”

Flexible production system, value chain, and agile workforce, enable individualized mass production in ever changing market condition.

AUTOMATION INDUSTRY ASSOCIATION

Disruption in Ecosystem



- Open Networks
- Cloud Environment
- Robotics
- De/skilling

Samarth Udyog (समर्थ उद्योग)

Smart Manufacturing means creating a competent, collaborative and competitive manufacturing process..
India's needs are unique…
(स्मार्ट विनिर्माण का मतलब एक सक्षम, सहयोगी और प्रतिस्पर्धी विनिर्माण प्रक्रिया बनाना है…
भारत की जरूरतें अनूठी हैं…)

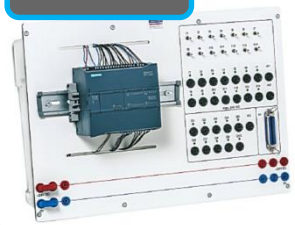
Collaboration is the bridge

ADVOCACY

COMMUNITIES

SAMARTH

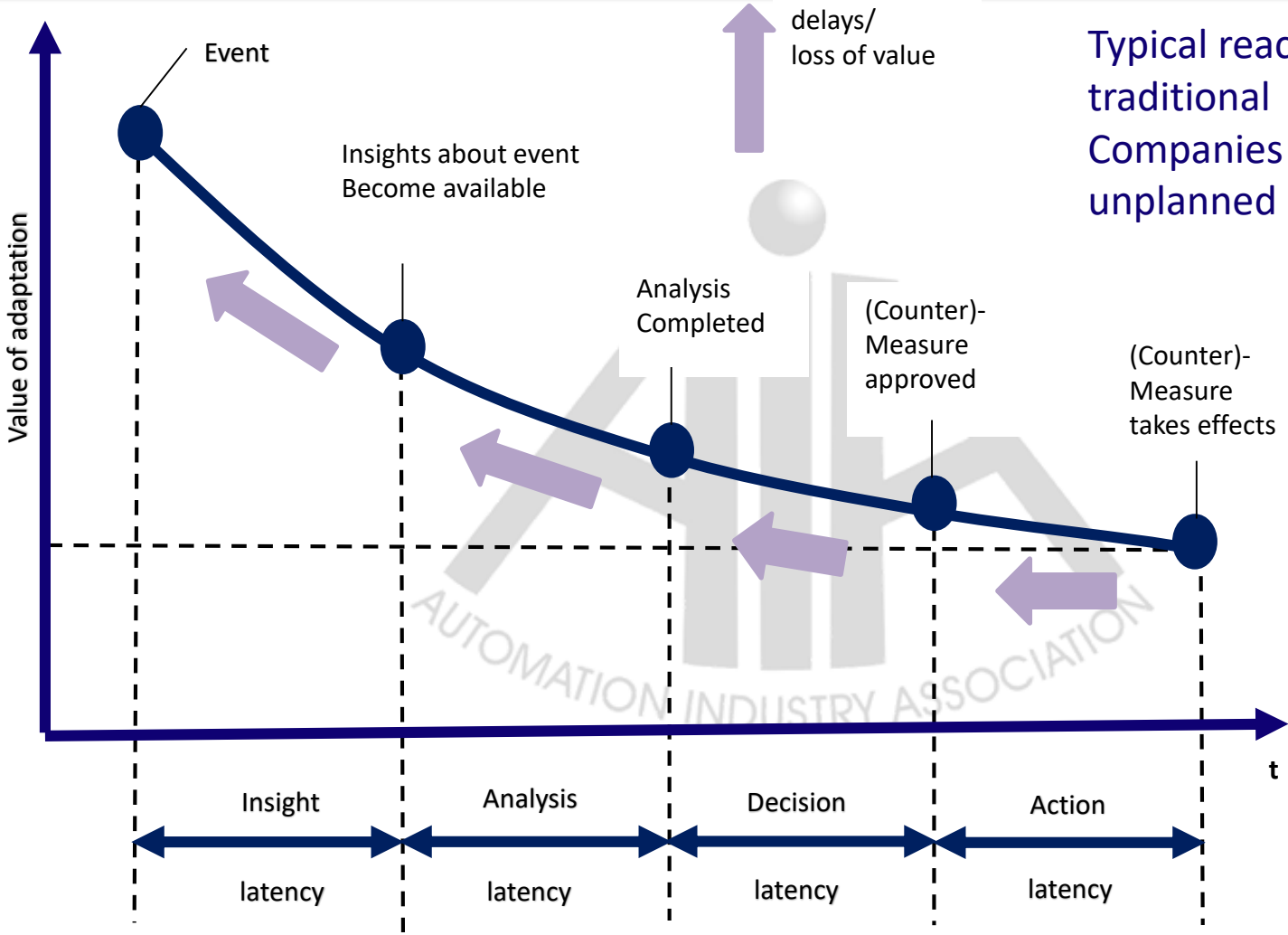
SKILLING



UDYOG

EDUCATION

Digital, agile businesses outperform traditional business



Digital Empowerment for People

Digital

EMPOWERMENT

Management Style

Ecosystem

designed to increase the degree of autonomy and self-determination in people and in communities in order to enable them to represent their interests in a responsible and self-determined way, acting on their own authority."

Culture

Execution

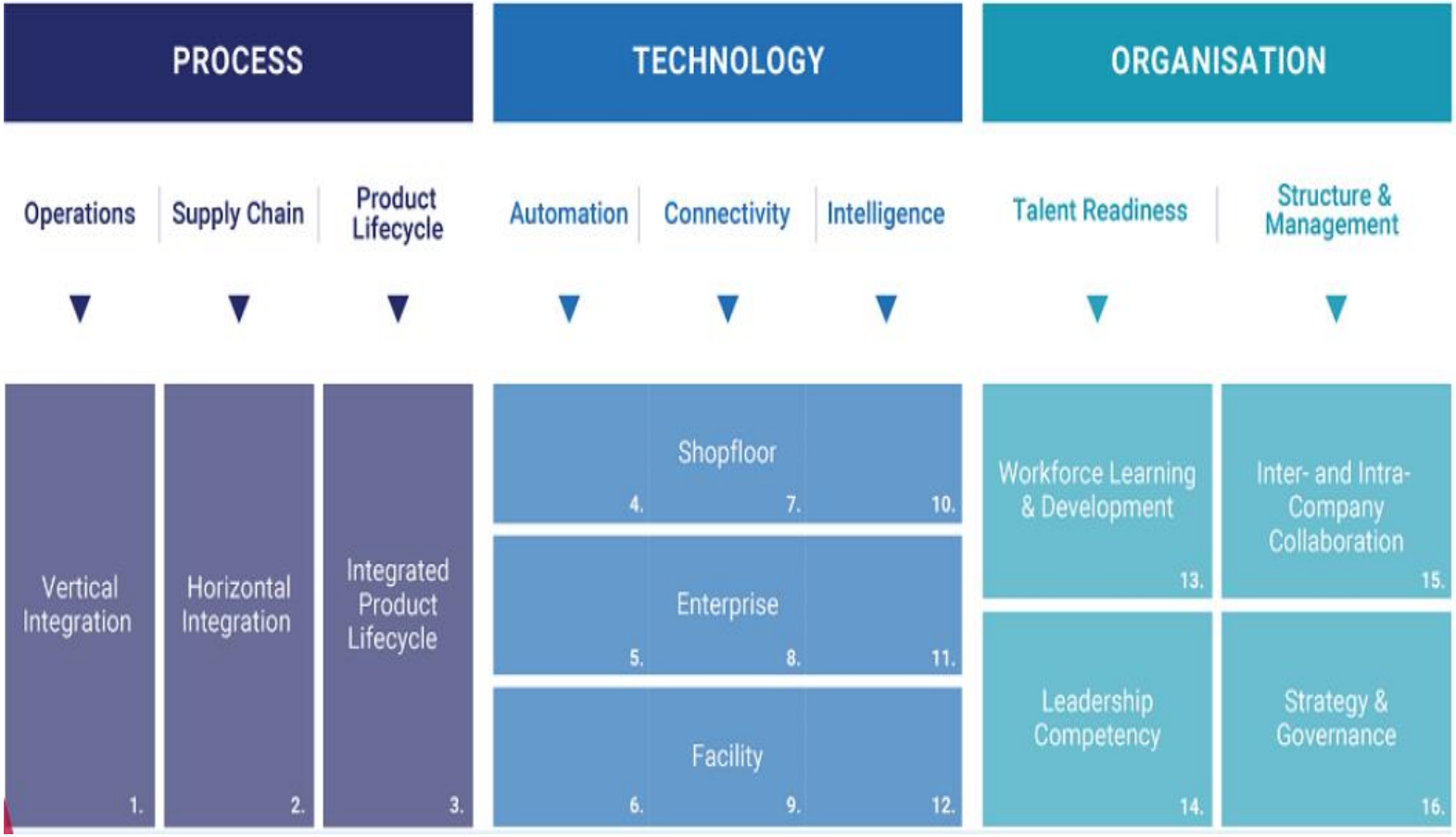
Decision Making

Technology tools/Autopilot

It’s a new World!

- VIDEO 1 (Sepak Takraw)

Assess Your Firm's Readiness



LEVERAGE **AUGMENTED REALITY (AR)** FOR IMPROVING WORKFORCE PRODUCTIVITY

Tushar Ghosh

Technical Manager , North & East

ptc

- Global software company, headquartered in Boston, MA
- $1B+ Revenue
- 30 years heritage in **Digital Definition** , software & Lifecycle management of things
- Industry leading:
  - IOT & AR Solutions
  - CAD & PLM Solutions
- Helps companies accelerate digital transformation
- Provides IoT/AR solutions to drive operational excellence and increase workforce productivity

3 LEVERS OF OPPORTUNITY FOR DIGITAL TRANSFORMATION

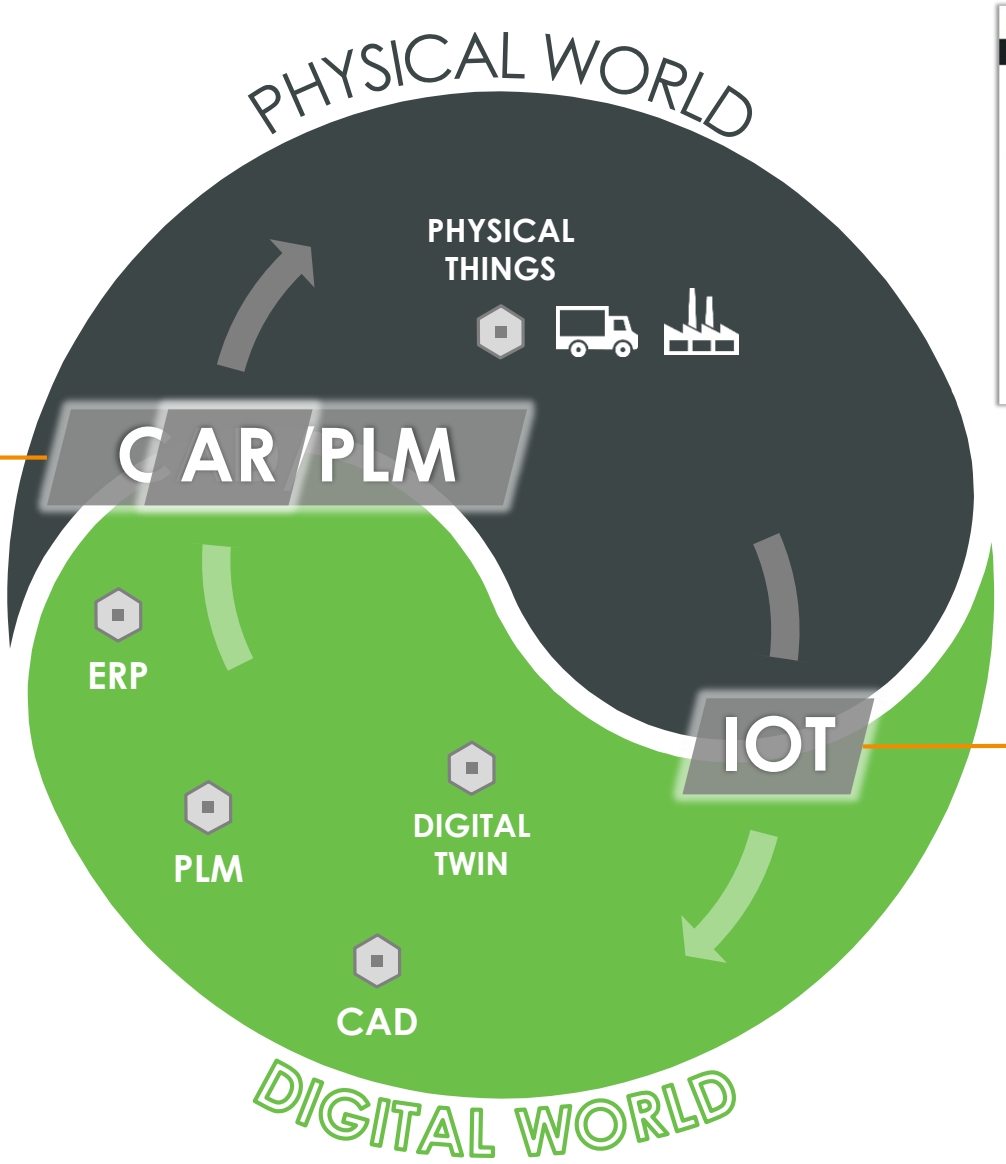
Differentiate Products and Services — PRODUCTS

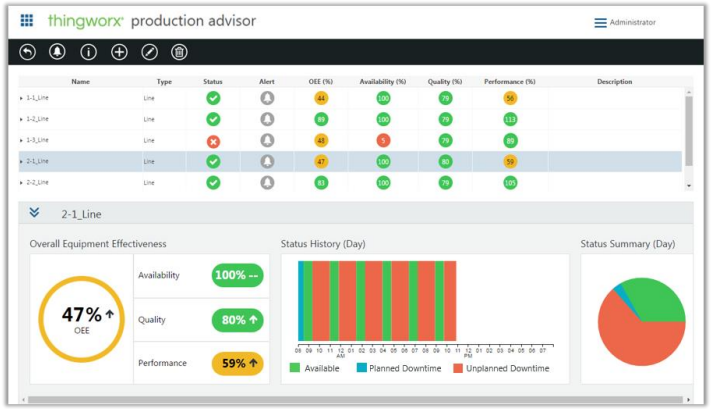
OPERATIONS — Improve Operational Efficiency

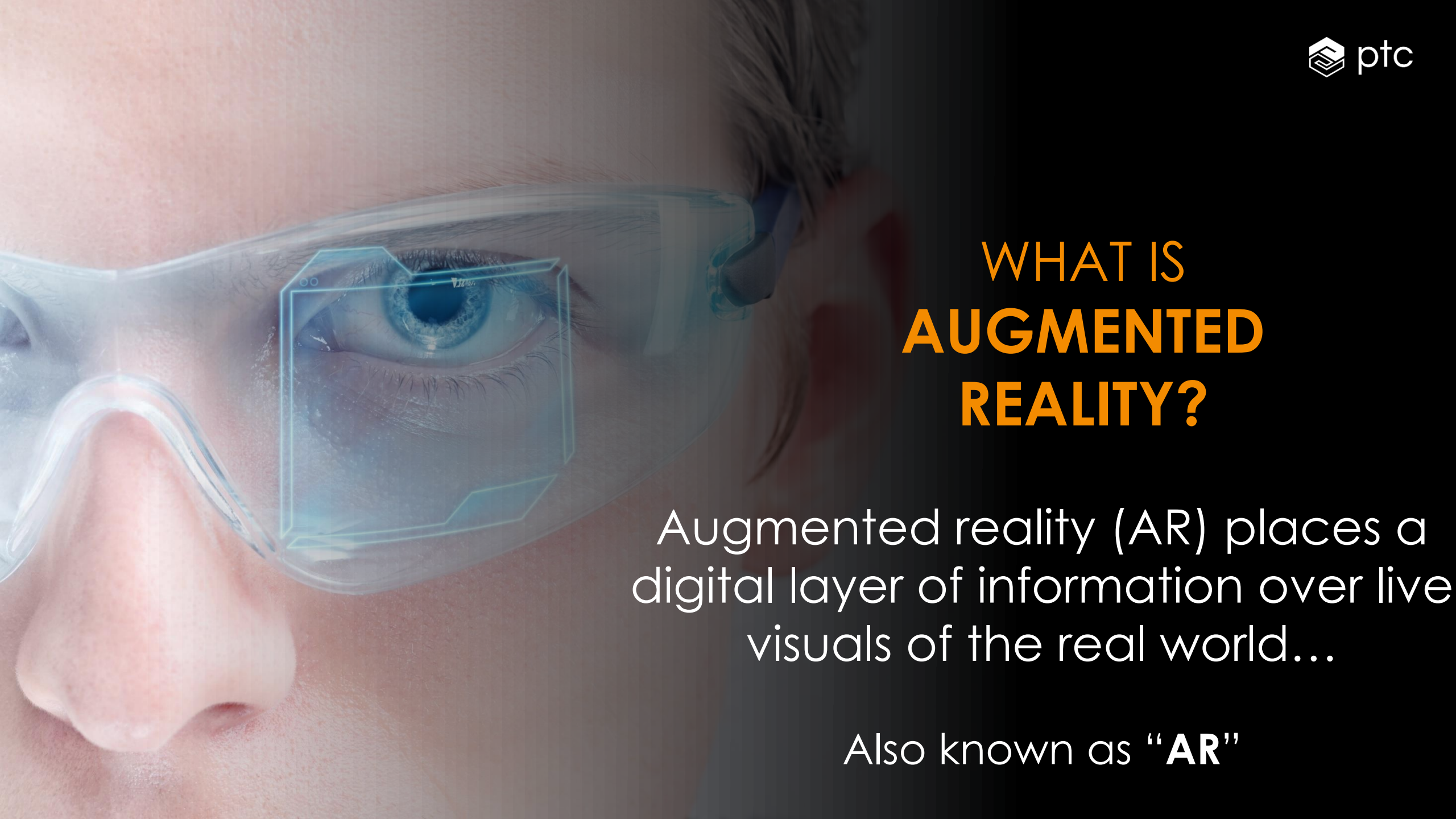
WORKERS

Increase Workforce Productivity

PHYSICAL DIGITAL CONVERGENCE UNLOCKING THE VALUE





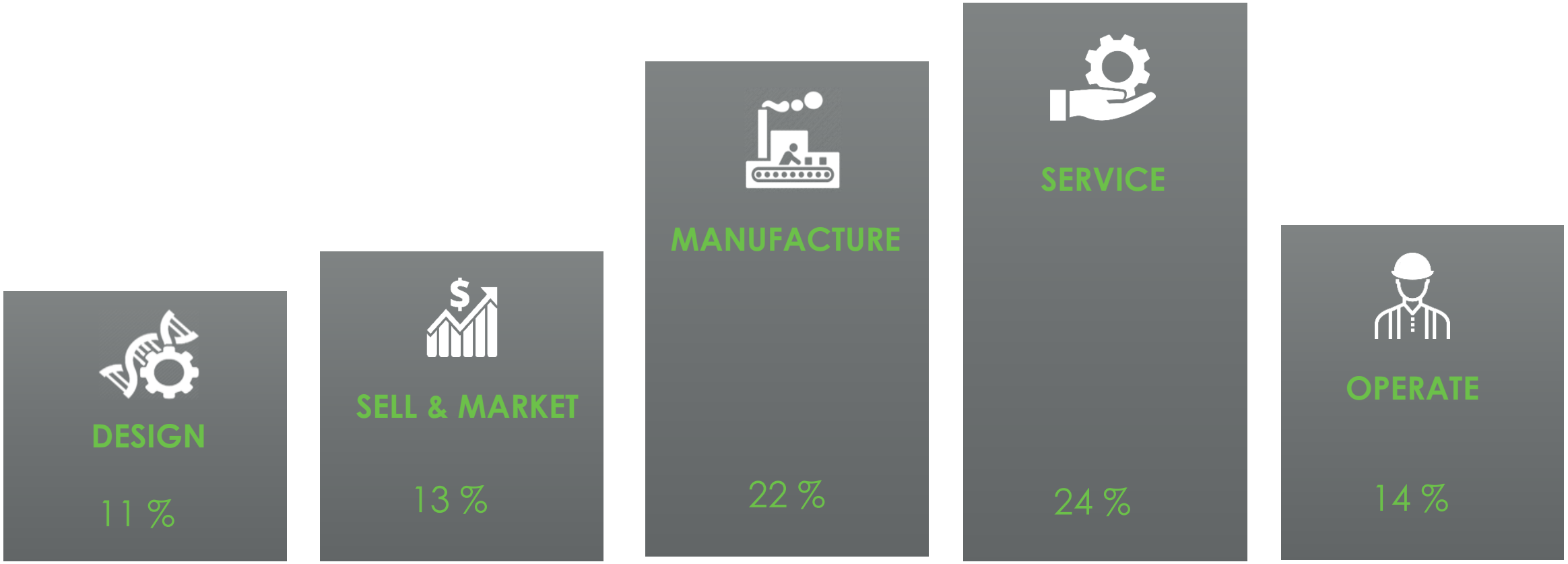


WHAT IS **AUGMENTED REALITY?**

Augmented reality (AR) places a digital layer of information over live visuals of the real world…

Also known as "**AR**"

AR VALUE ACROSS THE INDUSTRIAL ENTERPRISE



AR KEY CAPABILITIES

Visualize

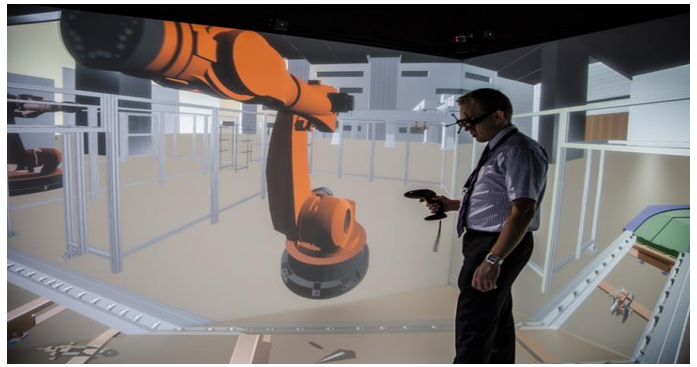
Enhance the user's **view** of the physical world with the overlay of **real-world** or **hypothetical digital information:**

- IoT data
- Digital models
- Third-party data
- Business systems information

Instruct/Guide

Train or guide users on how to perform a task through the overlay of **digital instructions** or **real-time expert guidance**

- Real-time transfer of knowledge and expertise
- Digital step-by-step instructions to guide user



Interact

Manipulate digital graphics or extend a product interface through an **AR interface**

- Expanded and customize control of product functions
- Modify digital designs
- Enhance physical products with digital experiences

HOW AR CAN HELP IN INDUSTRIAL SPACE ?

- ✓ 3D AR Work Instructions
- ✓ Augmented Process Operation
- ✓ Step-by-step 3D guided service instructions
- ✓ Expert Knowledge Capture
- ✓ Remote Assistance
- ✓ Augmented Training

SERVICE , OPERATION & MAINTENANCE

AUGMENTED MANUFACTURING INSTRUCTIONS

What this means

- 3D step-by-step digital content overlaid on real-world equipment
- Up-to-date & in-context information at your fingertips
- Ability to visualize real-time IoT data and see inside products

AUGMENTED PROCESS OPERATION

What this means

- Augmented digital display of factory floor process parameters
- Augmented health checking of assets for maintenance requirements
- Visualize contextual Safety Instructions

GUIDED INSTRUCTION FOR SERVICE

What this means

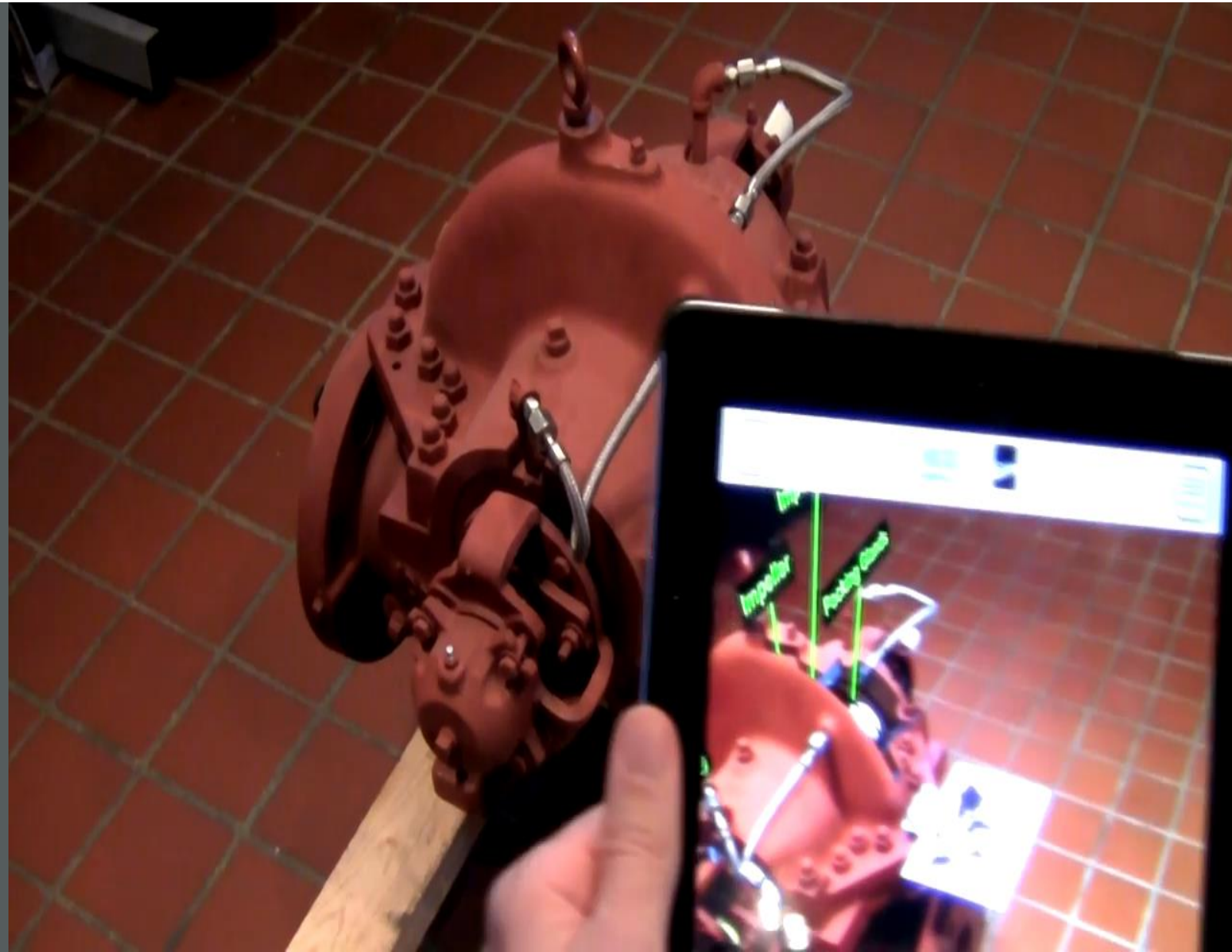
- Step by step guided service instructions at the point of execution
- Safety Instructions before executing service
- Contextual service information

AUGMENTED TRAINING DELIVERY

ptc

What this means

- Digital learning contents on the live view of the physical asset for greater understanding
- Virtual products - walk around and view inside
- Demonstrate large immobile equipment



EXPERT KNOWLEDGE CAPTURE

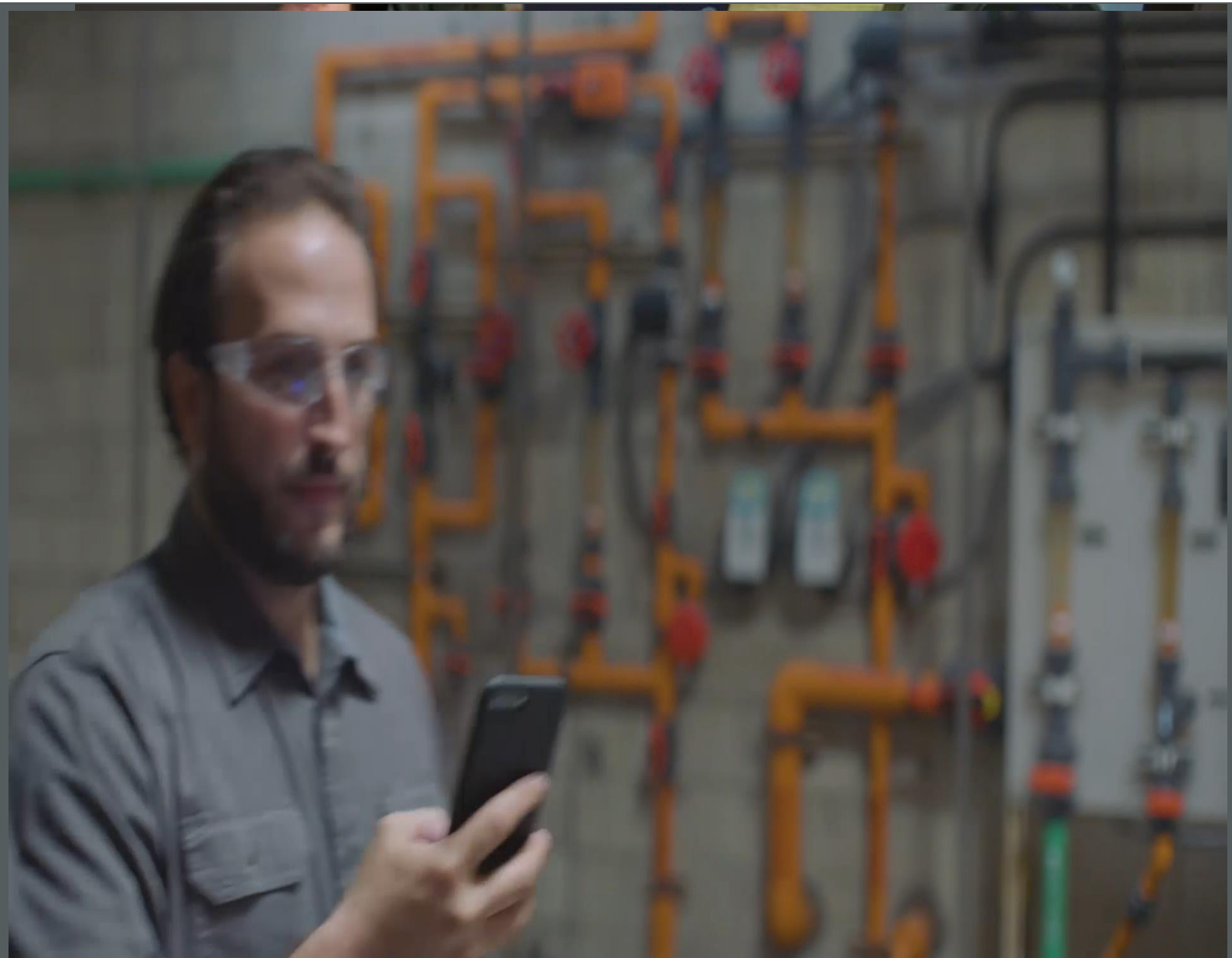
What this means

- Video capture of tribal knowledge and "best practices" while experts work
- Create step-by-step guidance for set-up, changeover & maintenance
- Publish procedures as hands-free instructions or digital documents

REMOTE ASSISTANCE – SEE IT SOLVE IT TOGETHER !

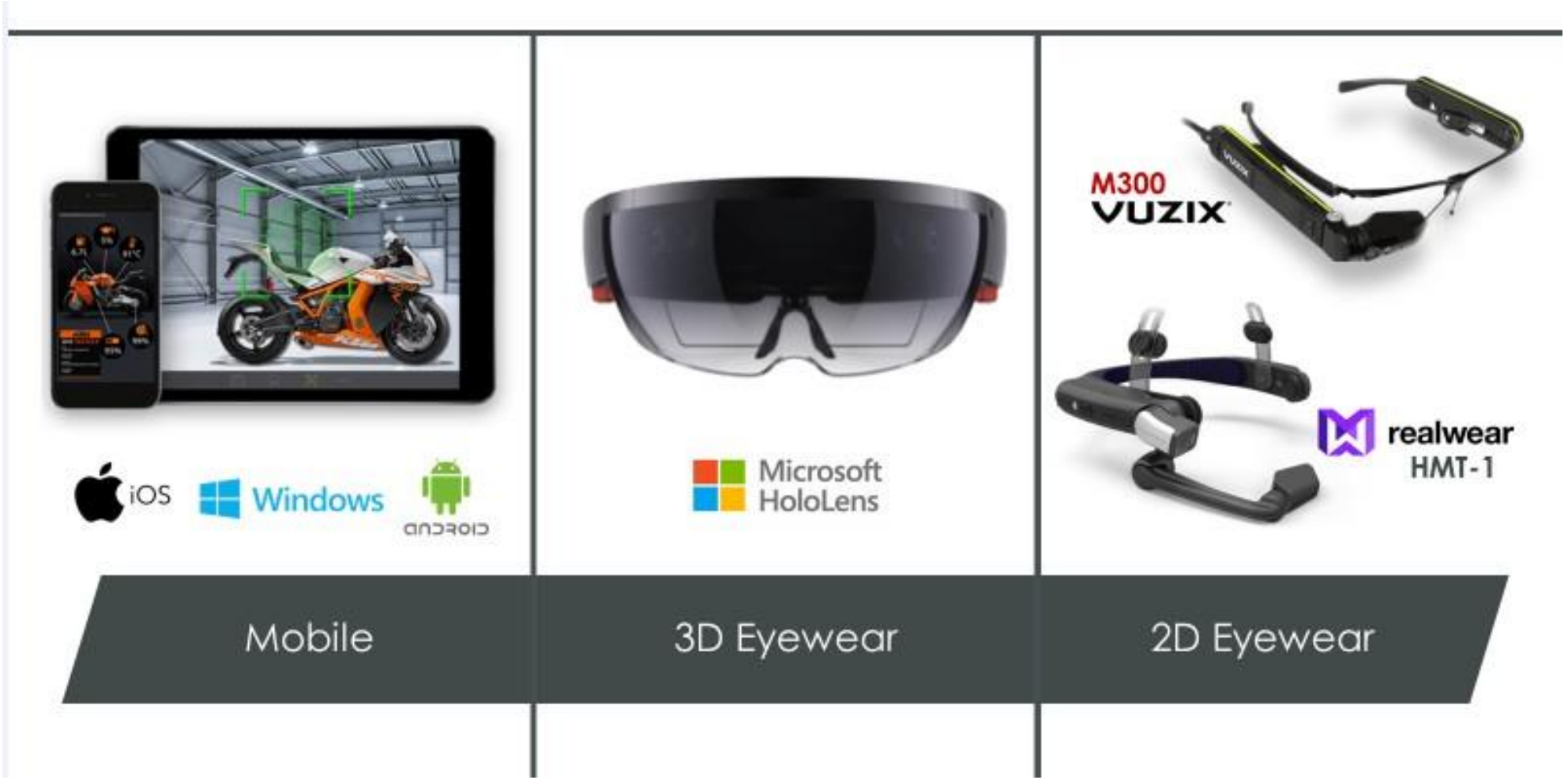
What this means

- Allows technicians to effectively connect with experts to solve critical issues
- Combines live video, audio and annotations on the live shared view
- Mark-up the real-world
- Precise annotations anchored to real-world



VIEW AR EXPERIENCE ON YOUR FAVOURITE DEVICE

vuforia™



PTC AUGMENTED REALITY - VUFORIA PRODUCTS

vuforia® studio™

for Enterprise Content Creators

Powerful AR content creation and publishing solution for industrial enterprises

vuforia® chalk™

for Remote Assistance

Allows an expert to "see what I see" and annotate in a shared workspace

vuforia® expert capture

Rapid Expert knowledge capture

Rapidly capture and transfer 1st person perspective expert knowledge

vuforia® engine

for Developers

Allows custom apps to "see" and puts content in the world

VUFORIA CUSTOMER - INDIA

BLUE STAR

Use case :
- Inspection
- Manufacturing operation
- NPD

GRIND MASTER

Use case :
- Marketing & Sales

GE

Use case :
- Training
- Manufacturing

Atlas Copco

Use case :
- Presales
- Manufacturing Process
- service

ROYAL ENFIELD

Use case :
- Marketing
- Genuine Accessories

KALYANI

Use case :
- Training
- Manufacturing Instruction
- Project Review

VUFORIA CUSTOMER - INDIA

ptc

stryker

Use case :
- Service
- Product Visualization

TVS

Use case :
- Training
- Knowledge capture

ET ELECTROTHERM

Use case :
- Sales & marketing
- Training

DIGITECH

Use case :
- Training
- Service

NIET Greater Noida

Use case :
- Student Projects
- Education

IIT Delhi
Indian Institute of Technology Delhi

Use case :
- Assembly operation
- Service


ptc

Surface Inspection System for Digital TV Production Line

Kaushik Saha

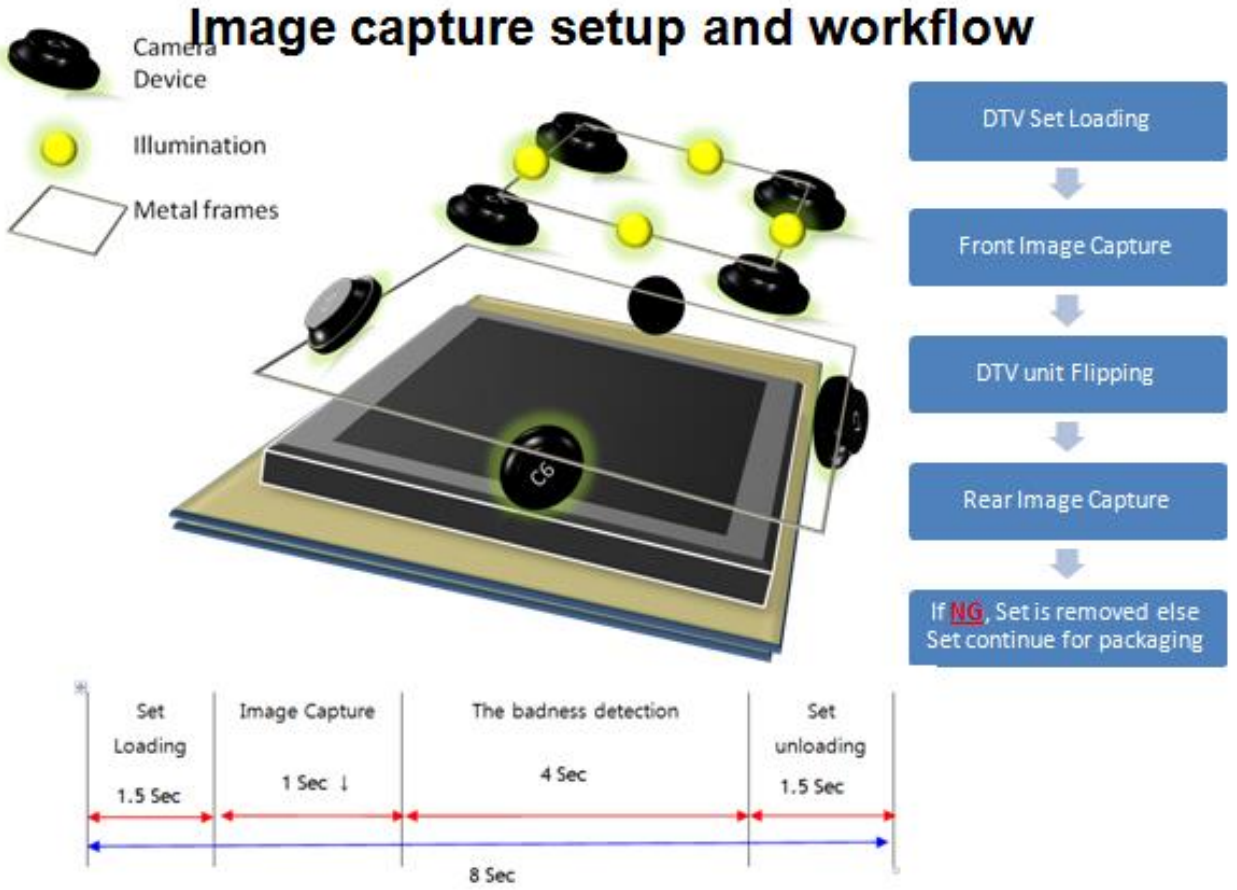
CTO, Samsung R&D India - Delhi

PURPOSE

- Reduce human operator intervention in DTV production line
  - Increase throughput
  - Reduce errors in product inspection
- Need a standard inspection system for DTV surface to replace inspection by human operator
- Need 0.1 mm resolution to detect defects

System Operation

- Support capturing TV surface image from camera devices
- Develop post-processing system for image captured by camera to make image amenable to automatic detection
- Develop automatic surface defect detection algorithms on pre-processed image
- Distinguish real defect from false defect on DTV
- Provide enough flexibility for differently sized DTV model (32”-55”).



System Functionality Requirements

- 1D/2D Bar Code detection – Various standards to be supported
- Multi Bar Code Detection – Different orientations, Need to separate out barcode from whole TV image
- OCR – Optical Character Recognition
- Image Matching and Pattern Inspection
- Image Correction and Enhancement
  - Correction for Camera distance, Zoom, Different placement of Barcodes & Text
  - Correction of Image Artifacts (Lack of focus, Low contrast, Damaged)

Surface Inspection Technology Developed

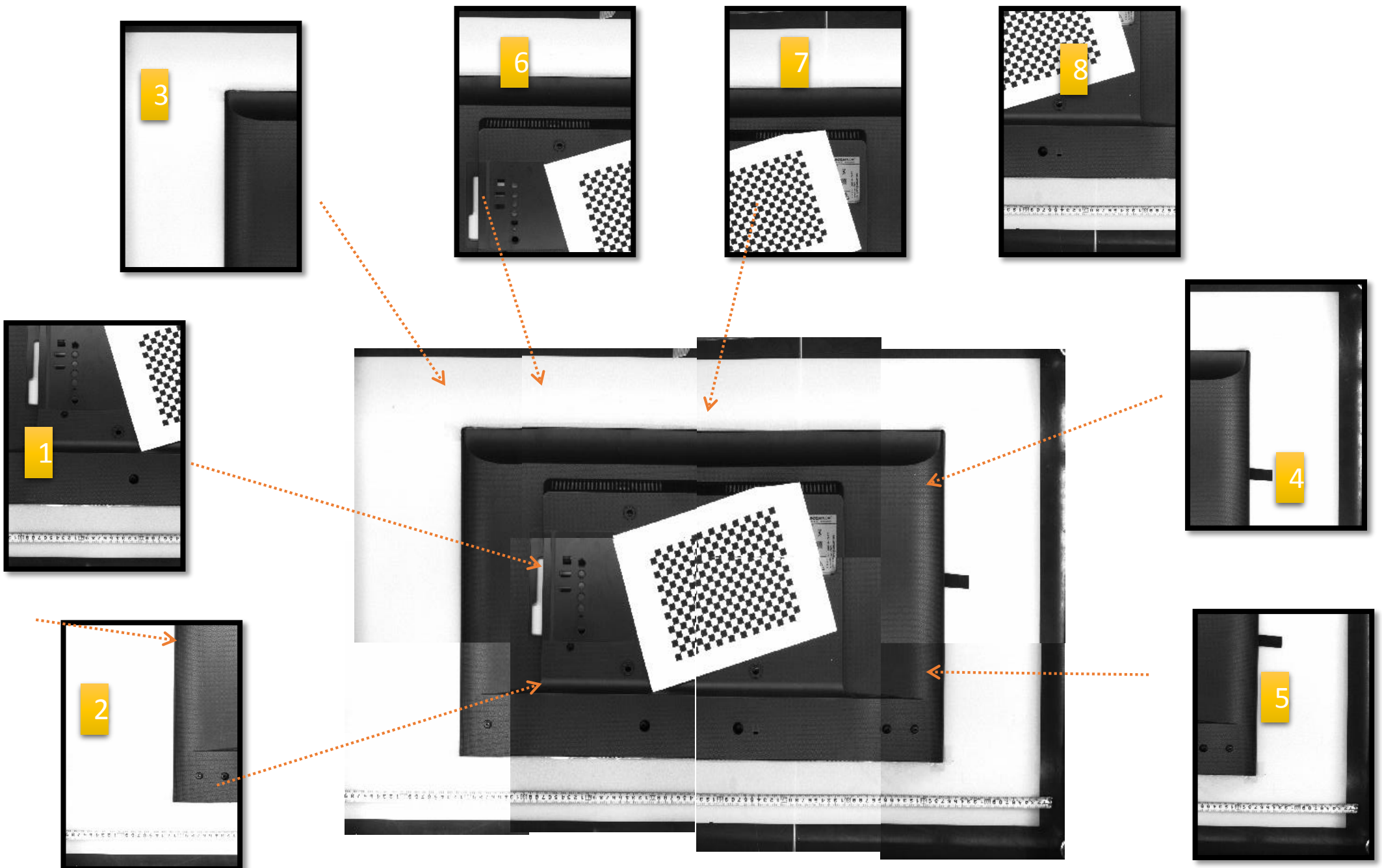
- ✓ Automatic Scratch Detection Front Panel and Rear Cover
  - I. Shallow Scratch **(>0.1 mm & <0.3mm)**
  - II. Deep Scratch **(>0.3mm &<1mm)**
  - III. Scratch on **Textured surface**
- ✓ Tear Mark or Poly-Cover Damage Detection in Bezel
  - ***I. Machine Learning based classification***
- ✓ Missing Screw Detection in Rear cover
  - ***I. Machine Learning based***
- ✓ Automatic Bad Logo Printing Defect
  - I. On **white Printed Plastic Bezel**
  - II. Metal Printed Logo
  - **III. Back-Light** Logo
- ✓ Multi-Image Stitching Algorithms
  - I. Tested **on 6/8 Image 14 Megapixel** DTV Rear Images
  - *II. Advance Edge based Correlation technique*

Shallow Scratch- Highly challenging

Tear Mark Detection

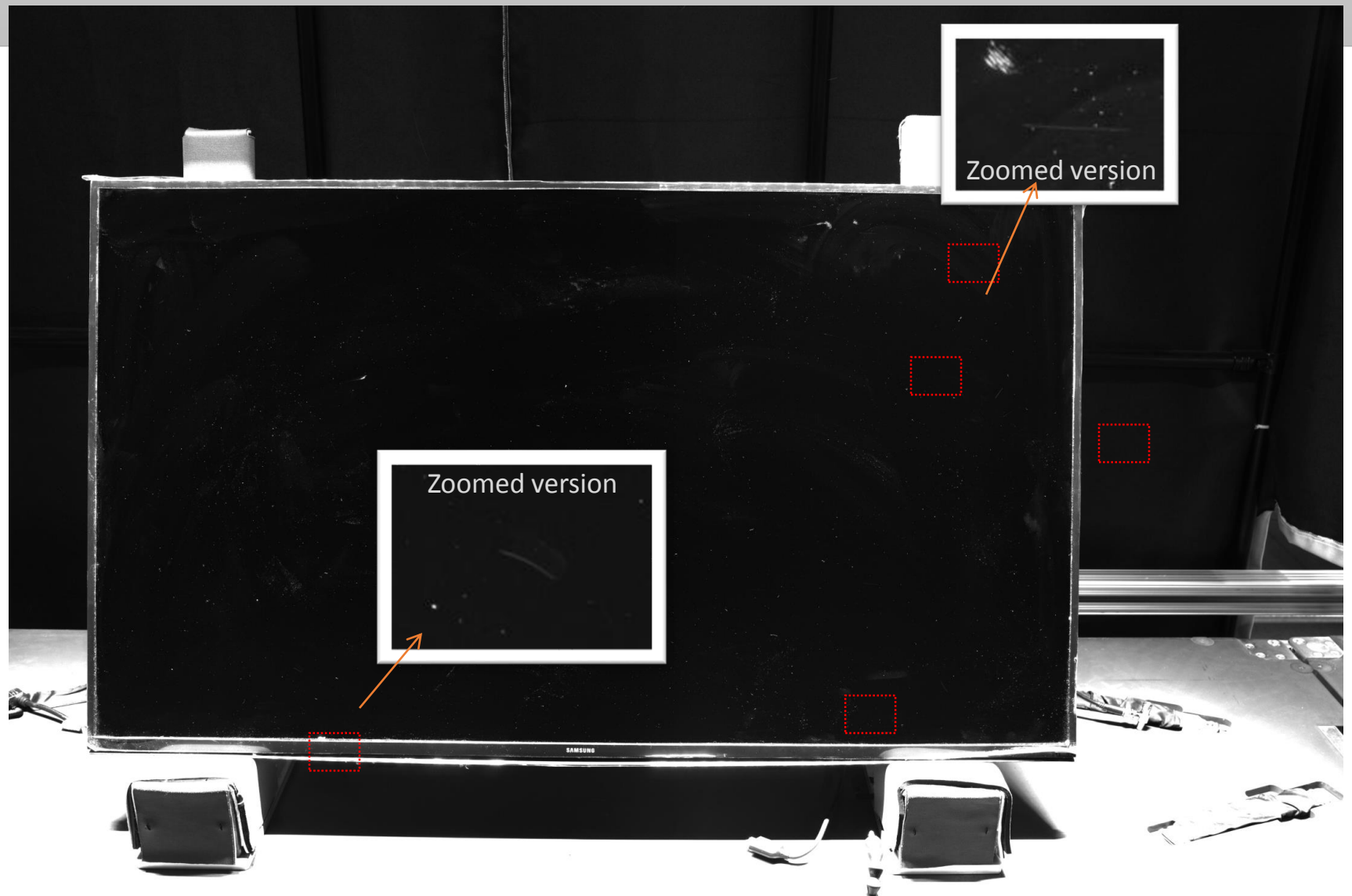
Bad Logo Detection

Image Stitching

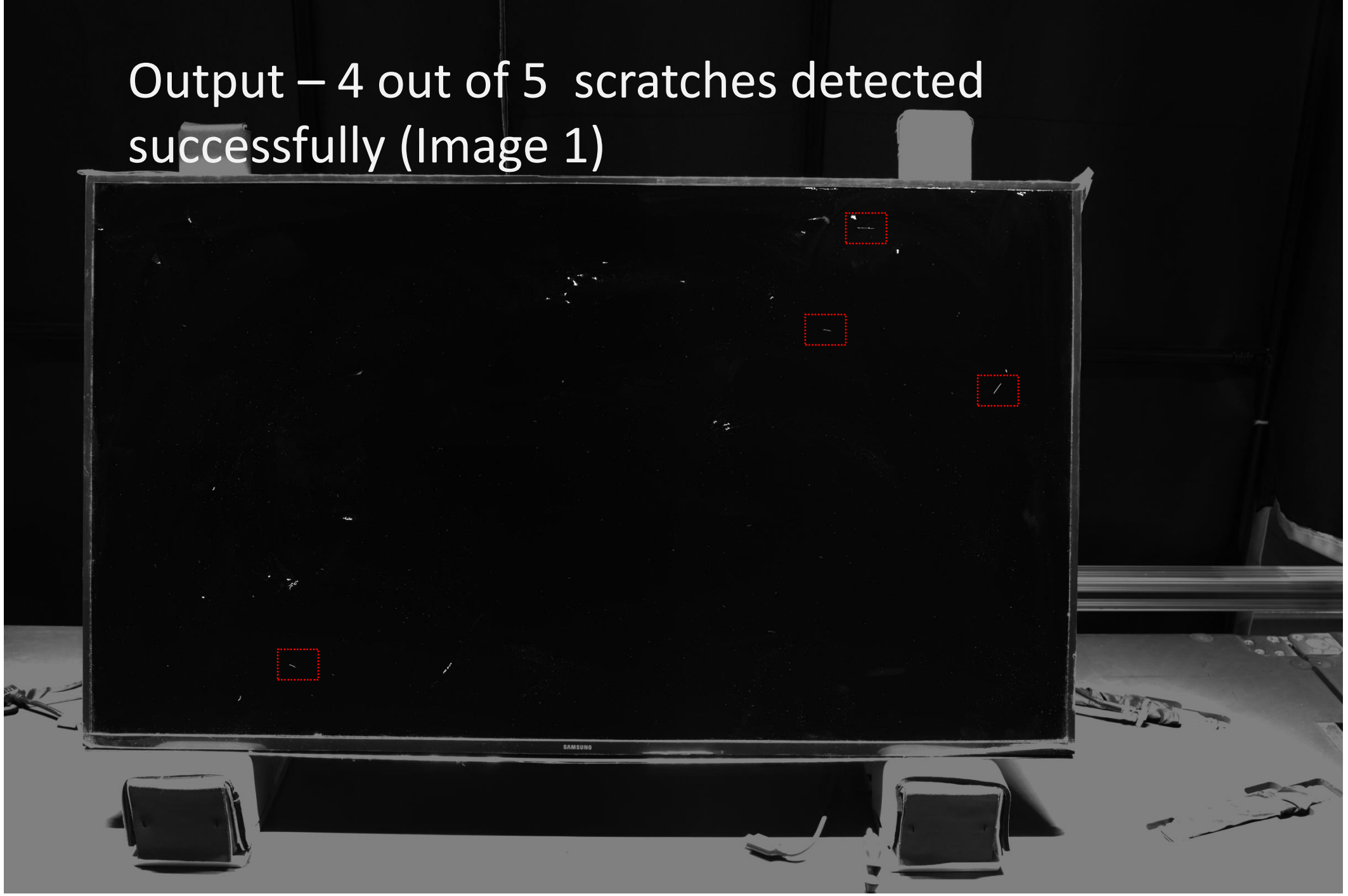


Final Stitched Output

Very Large Size Image, 29,000,000 pixels – view **@400%** to see scratch



Output – 4 out of 5 scratches detected successfully (Image 1)



Surface Defect Inspection Software and User Interface Capabilities

FRONT

- **PANEL**
  - SCRATCH Detection
- **MIDDLE**
  - BAD LOGO PRINTING Detection
  - TEAR MARK/ POLY COVER DAMAGE Detection

REAR

- SCRATCH Detection
- SCREW MISSING Detection
- BARCODE Detection
- IN-LAY COMPONENTS

Image Stitching

User Interface Development

- Implementation C# on Windows
- Operator Teaching Window
- Main UI
- Parameter Setting UI

Achievements

- Developed User / Operator Interface of the complete system
- ~98% accuracy in logo segmentation and bad logo classification
- Tear Mark Defect Detection in Middle Region Sensitivity = 89.4% , Specificity = 88.2%
- Panel Scratch Defect... ~88% accuracy
- Screw Missing Detection tested on real production images, sensitivity = 92%, specificity = 84.2%
- Algorithms Timings – Rear Defect Detection ~5.6 sec; Front defect Detection ~1.5sec

THANK YOU

IIoT INDIA

RE-IMAGINING THE FUTURE

#iiotindia

5-6 DECEMBER 2019

IIT DELHI, INDIA

SMART MANUFACTURING

SMART INFRASTRUCTURE

Organised By

SingEx

Industry Partner

AIA
AUTOMATION INDUSTRY ASSOCIATION

Ecosystem Partner

FSM

Co-Located Event

XELERATE INDIA

Introduction

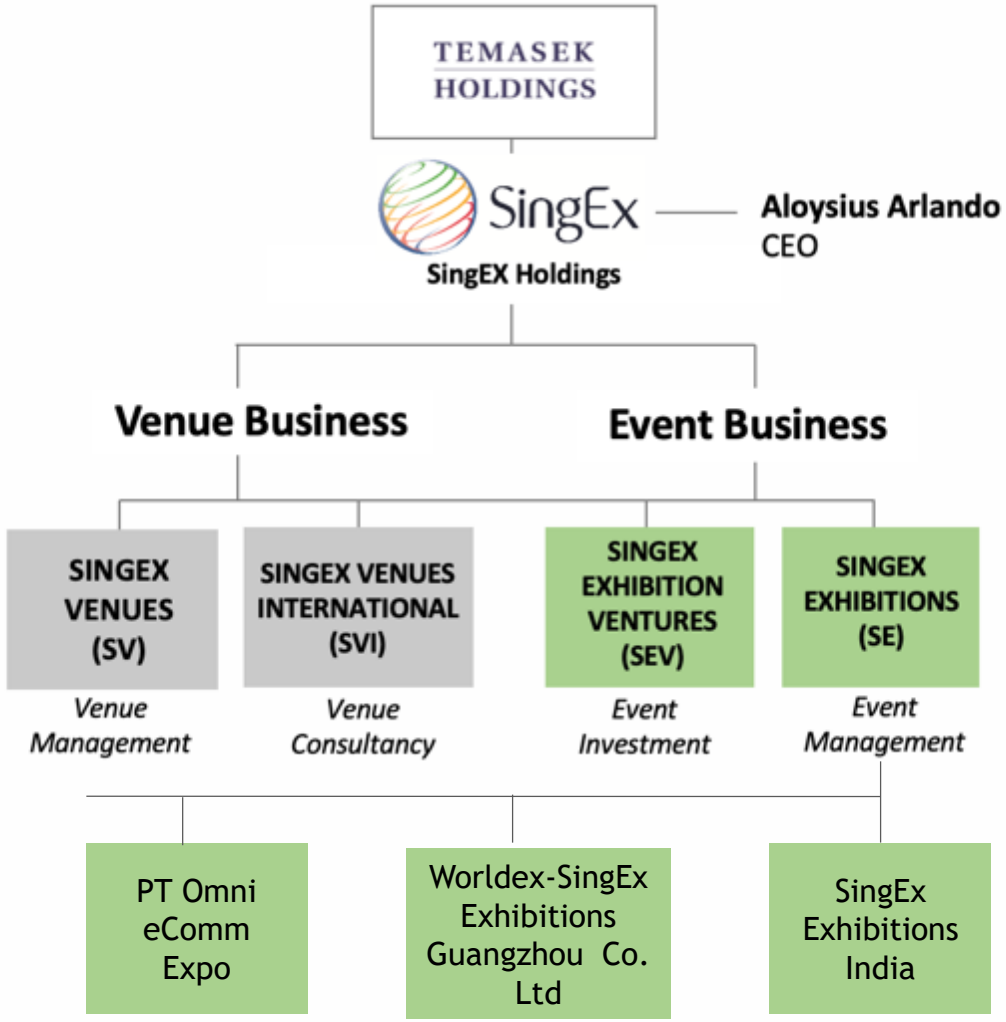
Introduction To TEMASEK & SingEx Holdings

TEMASEK

Temasek Holdings is a state-owned holding company owned by the Government of Singapore. Incorporated in 1974, Temasek owns and manages a net portfolio of S$275 billion (as of 31 March 2017), with S$18 billion divested and S$16 billion invested during the year, and 68% exposure to Asia – 29% Singapore and 39% Asia ex-Singapore.

SingEx

SingEx Exhibitions India harnesses industry insights and strategic networks to develop, curate and organise a series of trade exhibitions and conferences in various emerging industries in India. These events aim to connect businesses in India with Asian and international organisations, and facilitate business matching opportunities and knowledge sharing.



Vision For IIoT India Platform

Vision For IIoT India Platform

IIoT India is an event to bring together an ecosystem of manufacturers, government agencies & businesses ranging from multinational corporations (MNC) to small and medium enterprises (SMEs) to shape and support their transformative initiatives by creating collaboration and knowledge sharing opportunities in the Smart Manufacturing & Smart Cities value chain.

Vision:

- To build IIoT India into a leading business platform in India which will shape and course correct the efforts towards future growth of Industrial IoT
- An annual gathering of industry players to learn, understand, share, collaborate, do business and sustain growth; a “must attend” calendar event.

Objectives for 2019:

- Establish IIoT India as a credible & recognized platform for facilitating industry-wide efforts & collaboration
- To showcase and demo innovative technologies and digital solutions from global players and budding innovators
- Build content and inspire influencers and leaders from industry to take definitive action. (By The Leaders, For The Leaders)

Stakeholders

Broad Level National Agenda

Specific Industry Focus

Promote and Represent Members' business interest

Steering Committee

Get support and strategic insight in terms of policies.

INVEST INDIA · DIPP · NITI Aayog

Advisory Committee

Provide insights on industry trends and guide in the development of market relevant content, the overall theme and framework for the event, and develop Assessment Framework for India.

Industry Experts | Trade Associations | Institutes of Higher Learning | User Community

Ecosystem Partners

Region wide engagements and content curation for the event, information dissemination, and developing baseline dataset from Assessment Framework for India.

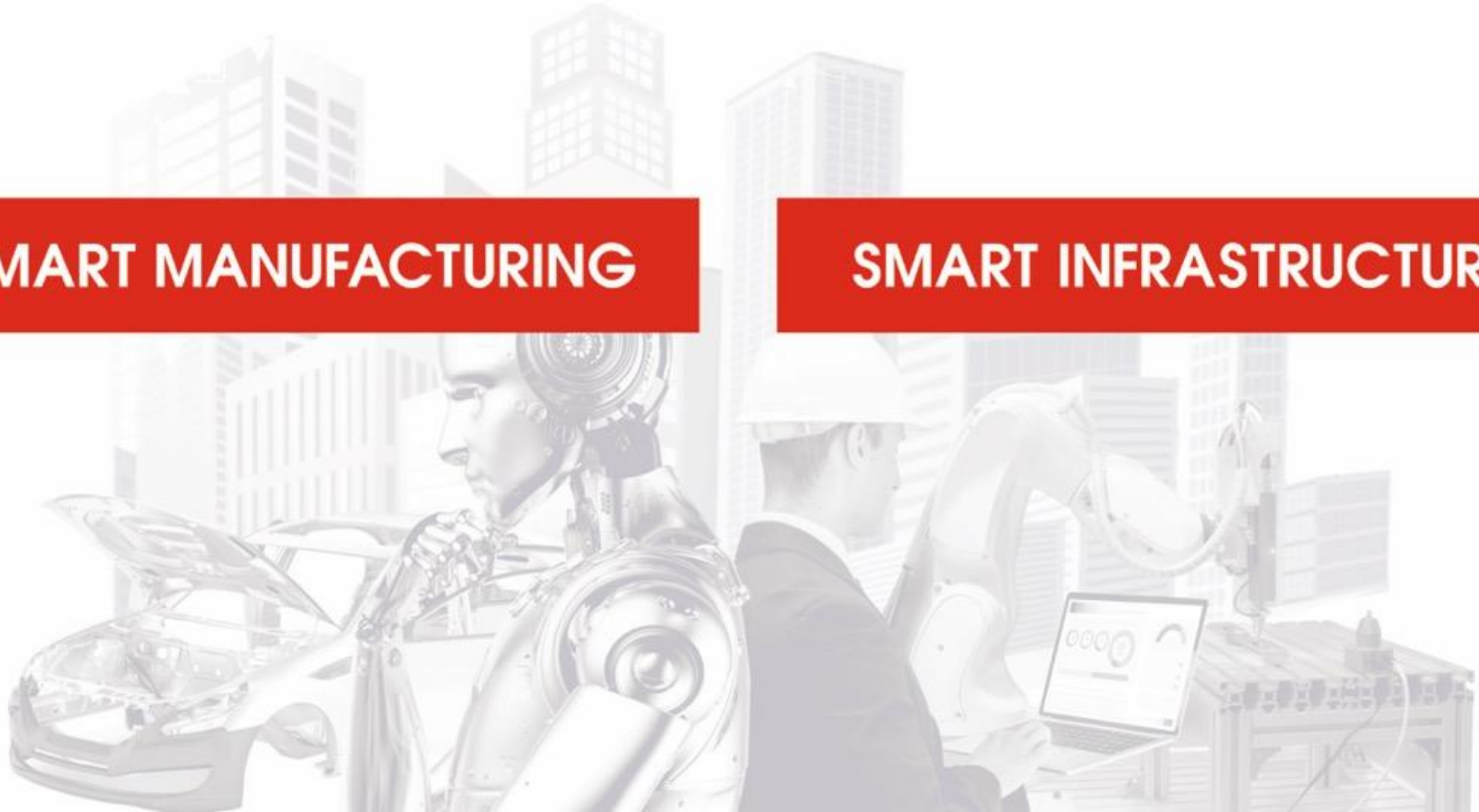
Chambers of Commerce | Trade Embassies | Trade Associations | Institutes of Higher Learning

India's Take on IIoT & Industry 4.0 and What's being planned?

IIoT INDIA

SMART MANUFACTURING

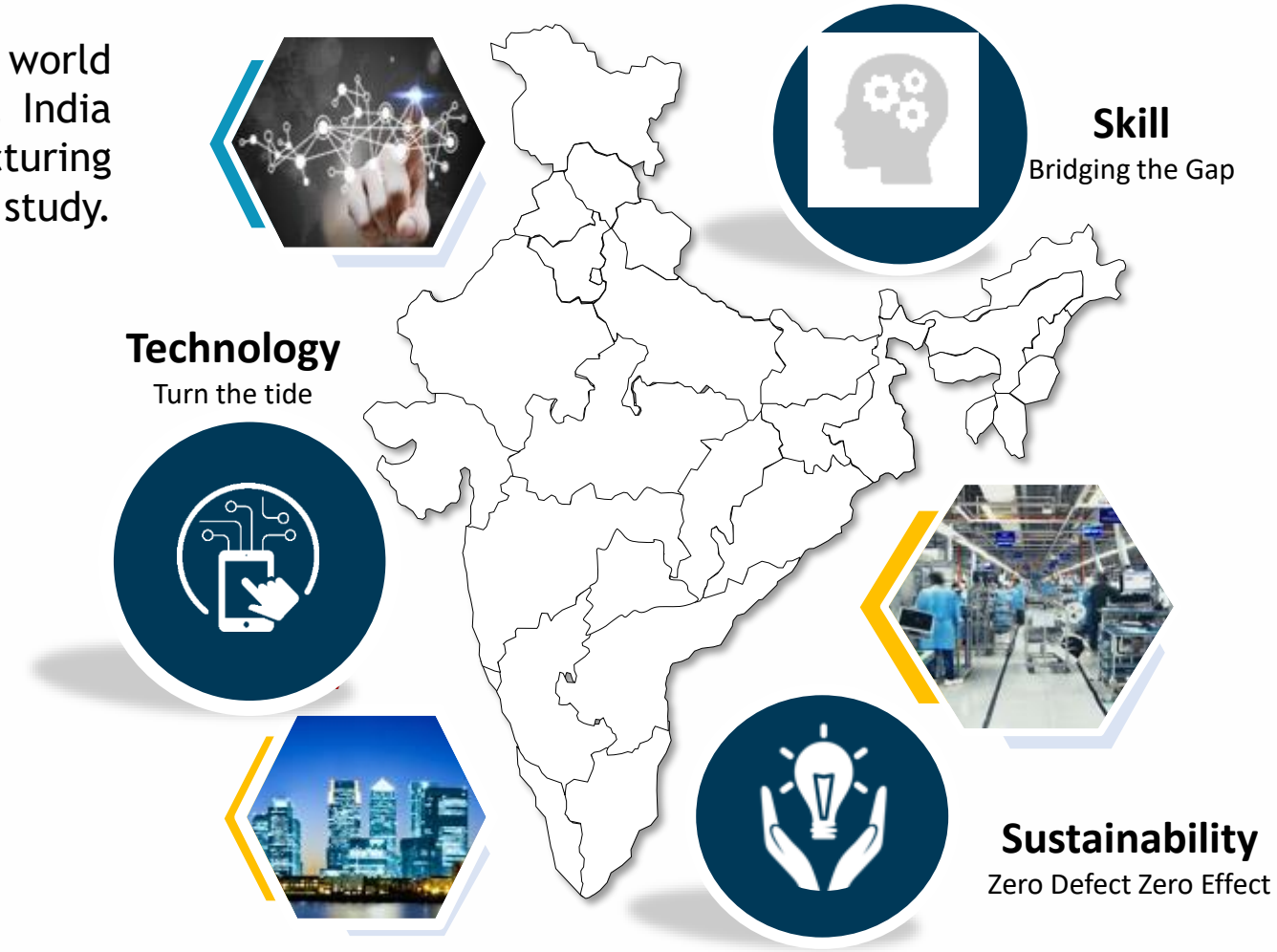
SMART INFRASTRUCTURE



Smart Manufacturing in India – Why and Why Now ?

Historically China has been the hardware base of the world whilst India catered to the software market. However, India is poised to jump up to 5th spot in Manufacturing competitiveness by 2020 as per Deloitte's Predictive study. Factors facilitating this paradigm shift are:

- Labour Costs
- Global giants entering India (From CBU > SKD > CKD > Manufacturing)
- Cost of Production
- Ease of Doing Business
- Transportation Costs
- COST COMPETITIVNESS ??



IIoT in India

IIoT market size is expected to be US $ 4.95 Billion by 2020 in India

Utilities, Manufacturing and Healthcare are expected to see the highest adoption levels of IIoT in India.

Smart Utilities IIoT market size to be US $ 1.8 Billion by 2020 in India

Manufacturing IIoT market size to be US $ 0.4 Billion by 2020 in India

Healthcare IIoT market size to be US $ 0.3 Billion by 2020 in India

IIoT market size to be US $ 2.3 Billion for other industries, by 2020 in India

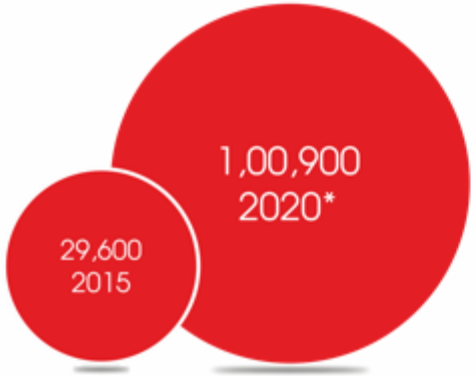
Source: GE Estimates*

India vs ROW

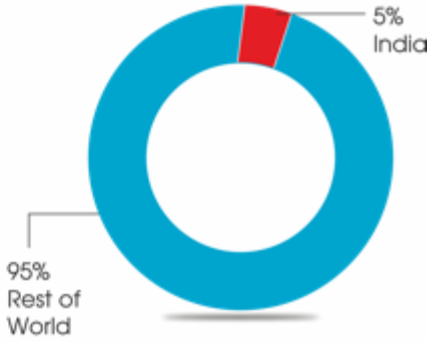
Connected Growth

Internet of Things has reached industrial production and might soon extend to the consumer market as well

IoT Market in India (₹ cr)



ESTIMATED SHARE OF INDIAN IoT OUT OF THE GLOBAL MARKET IN 2020

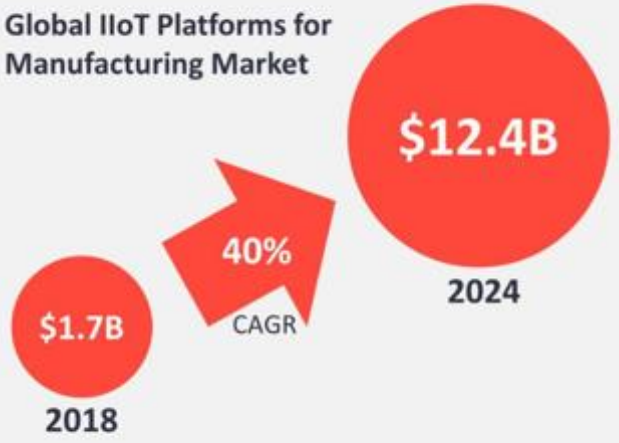


IoT LANDSCAPE IN INDIA (%)

*Estimated; start-ups setup in 2012 & after, mid-sized firms setup between 2005 & 2012 integrated firms are IT-BPM firms offering IoT Services & Products Sources: Nasscom

IIOT PLATFORMS FOR MANUFACTURING

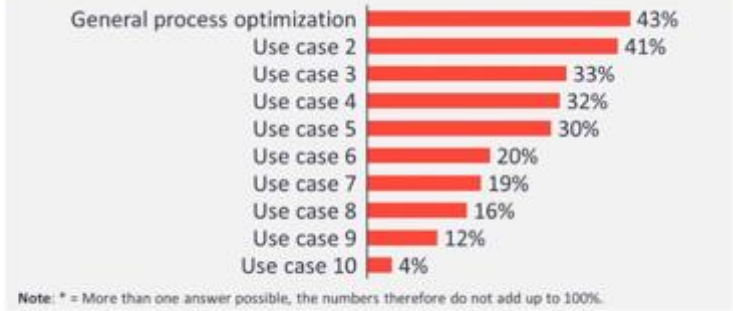
Global IIoT Platforms for Manufacturing Market



Fast growing (40%) IIoT Platforms for Manufacturing Market:

- **60%** of the market is **within factory environments.**
- **Discrete** manufacturing is the biggest segment, followed by Process and Batch manufacturing.
- **Asia** to become the biggest region for IIoT platforms.

TOP USE CASES IN MANUFACTURING

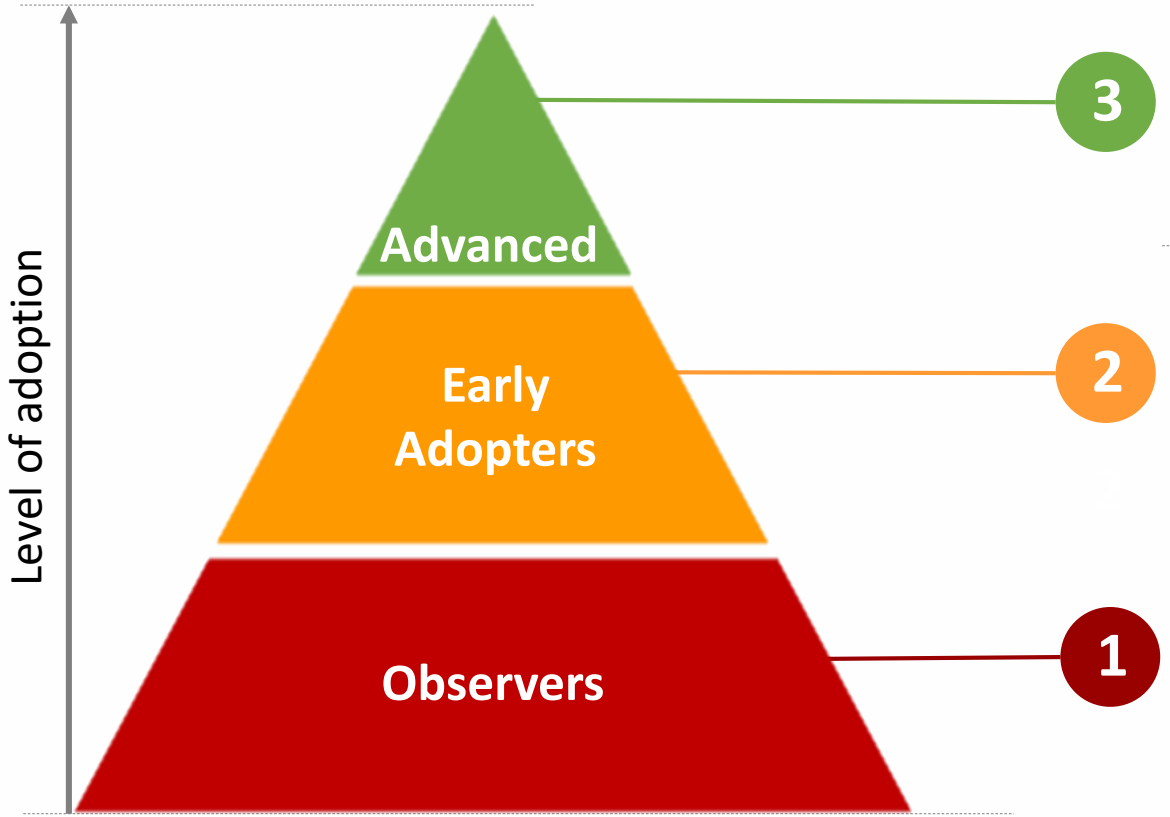


Note: * = More than one answer possible, the numbers therefore do not add up to 100%.

Source: IoT Analytics– April 2019 – New market report publication: **IIoT Platforms for Manufacturing 2019-2024.**

Building Blocks For Revolutionizing The Industrial Landscape

A "Learning Journey" approach to be followed to engage companies based on different level of adoption of IoT in Smart Manufacturing & Smart Cities



	Profile	Learning Journey Application
3	• Innovators • Taking successful strategic experiments and implementation mainstream ' enterprise wide'	• Advanced track targeted at integrated product lifecycle solutions / skills training • Contributor at conference sessions
2	• Have some projects underway • Using strategic experiments & prototyping as a business case and roadmap – 'Pilot run'	• Intermediate track targeted at vertical integrated / horizontal integration solutions provider • Recommended demonstration areas and key notes to deepen understanding of Industrial IoT transitional phase and to help future proof their businesses
1	• Some awareness of Industrial IoT • Local operating structure and processes • Open to embrace new technology and ideas	• Simplified track with recommended list of solution providers to meet • Recommended demonstration areas and key notes to attend to understand Industrial IoT concepts, evaluate readiness and empower them to take first step

IIoT INDIA

WHAT ALL IS IN STORE?

EXHIBITION

Unique IIoT solutions and products will be featured at this platform focusing on the niche & substantial arena of Smart Manufacturing & Smart Cities.

CONFERENCE

Illustrative case studies, highlights of new & innovative technologies, and the changing face of competition & collaboration in India will be the core focus of the two-day seminar.

EXPERIENCE ZONE

The Experience Zone at IIoT India will bring together leading brands and tech innovators to demo new technologies and witness some of the brilliance from the industry.

BUSINESS MATCHING

Business Matching feature will offer all attendees and exhibitors the opportunity to pre-schedule one-on-one meetings based on business preferences.

WHAT TO EXPECT – IIoT INDIA 2019 IN NUMBERS

International Advisory Committee Members

IIoT INDIA

Sanjeev Sharma
Country Head and Managing Director
ABB

Dr. Rishi Mohan Bhatnagar
President
aeris

Sunil David
Regional Director - IoT
AT&T

Anup Wadhwa
Director
AIA

Vivek Saha
Lead Advisor - Digital Transformation & Consulting
DXC.technology

Manjunath Sharma
Assistant General Manager
FANUC

Uttam Bose
Managing Director & CEO
Hindustan Motors Limited

Dr. Sunil Jha
Professor
(Mechanical Department)

Divay Pranav
Senior AVP
INVEST INDIA

Amrita Gangotra
Executive Director
iTyukt

Arun Kapur
COO
Luxoft

Rakesh Khurana
Chief Operating Officer
IMD

Mukesh Kumar Gupta
Executive Director
MITSUBISHI ELECTRIC

Ravi Agarwal
Country Head & Managing Director
PEPPERL+FUCHS

Dilip Sawhney
Managing Director, India
Rockwell Automation

Kishore Jayaraman
President
Rolls-Royce

Ravindra Barlingay
General Manager
Connected Devices & Communication Gateway
Schneider Electric

Ali Hosseini
Founder & CEO
SenRa

Rajiv Arora
Group Head of Information Technology and CIO
SIEMENS
Ingenuity for life

Praveen Arora
Vice President
CSRC

Amit Rao
Vice President - Strategy & Business Development, Asia Pacific
TRUSTED OBJECTS

Juergen Hase
CEO
unlimit

Sumit Monga
General Manager
unlimit

Aditya K Shrivastava
Sr. Vice President
VE COMMERCIAL VEHICLES

Atul Govil
Sr. Vice President

Conference Agenda

1	Human-touch enhanced (India & Industry 4.0)/ Machine to human interaction (India & Industry 4.0)
2	Automation – Innovative development in India
3	The story of an MSME and its fight with Industry 4.0
4	India's path to Industry 4.0 – Machine as a service
5	IoT in telecommunication and 5G
6	Jobs 4.0

Speakers

IIoT INDIA

Virendra Chaudhari

India Sales Lead
Microsoft

Fadli Hamsani

Digital Transformation Senior Manager
Schneider Electric

Devendra Dhawale

Director
KPMG

Aloysius Cheang

Board Director and Executive VP Asia Pacific
Centre For Strategic Cyberspace

Ashok Ramachandran

CEO India and South Asia
Schindler India

Wanli Min

VP, Chief Machine Intelligence Scientist
Alibaba Cloud

Leonard Jayamohan

Director, Digital Sales SEA,
Hitachi Consulting

Bobby Varanasi

Co-founder and Strategic Advisor
ThynkBlynk

M.V Subramanian

SME Council Member
NASSCOM

Anil Bhasin

President
Havells

Ajay Nema

VP
Reliance Jio

Chandan Kumar

India Head for Optics
Nokia

and many more...

2018 Edition At A Glance

IIoT INDIA

Participation from more than **50** Exhibitors from across the globe

Over **30** Speakers from leading global MNCs

150+ Delegates attended **20+** Conference Sessions

More Than **1500** Visitors attended the Inaugural Edition

Co-located with **Xelerate India,** a platform to foster & bolster the potential of Indian Start-up Ecosystem

40+ Hosted Buyer Meetings conducted

CUSTOMER'S VOICE

Visitors

Objectives For Attending IoT India 2018

Satisfied In Terms Of Meeting Objectives

Overall Satisfied

Very Satisfied

Exhibitors

Satisfied With Participation At IoT India 2018 In Terms Of Meeting Commercial Objectives

Overall Satisfied

Very Satisfied

58%
Likely To Exhibit In The Next Edition

Thank You