



Add value.  
Inspire trust.

# Using the Smart Industry Readiness Index (SIRI) for Digital Transformation

MANUFACTURING SUMMIT 2019

Preparing Philippine Manufacturing of the Future of Production

Manila, 2 December 2019

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# EMBRACING CHANGE

*"We are at the threshold of a radical systemic change that requires human beings to adapt continuously. As a result, we may witness an increasing degree of polarization in the world, marked by those who embrace change versus those who resist it."*

*- Klaus Schwab,  
Founder and Executive Chairman,  
World Economic Forum*

# Why Transform Anyway?



- Leading countries are leaders in manufacturing today that are also well positioned for the future of production.
- Legacy countries: strong Structure of Production, low level of readiness for the future of production.
- Historically, many Legacy countries benefit from globalization. More developed economies outsourced lower pieces of the value chain to places with lower labour costs.
- **Legacy countries risk losing traditional manufacturing share to Nascent countries that can offer even cheaper labour**

# INDUSTRY 4.0 ACROSS THE GLOBE

## United States

**Advanced Manufacturing**  
Industrial IT and IoT drives horizontal integration with disruptive impact.



## Germany

**Plattform Industrie 4.0**  
Engineering driven Integration originating in automated production systems. Germany coined the term Industrie 4.0.



## China

**Made in China 2025**  
Technology development and strong adoption of robotics and IoT to climb up the manufacturing value chain.



## Japan

**Society 5.0**  
Cutting-edge innovation focusing on robotics and Artificial Intelligence with broad impact on Society.



## Singapore

**Smart Nation Initiative**  
Broad ecosystem with concerted digital initiatives across all sectors leads to high adoption rate of I4.0 solutions.



## India

**Made in India**  
Ambitious initiative to transform India into a global design and manufacturing hub.

### Other local initiatives

- Thailand 4.0
- Making Indonesia 4.0
- Industry4WD Malaysia
- Vietnam 4.0
- Philippines Industry 4.0



# 3 key observations on the industry adoption of Industrie 4.0

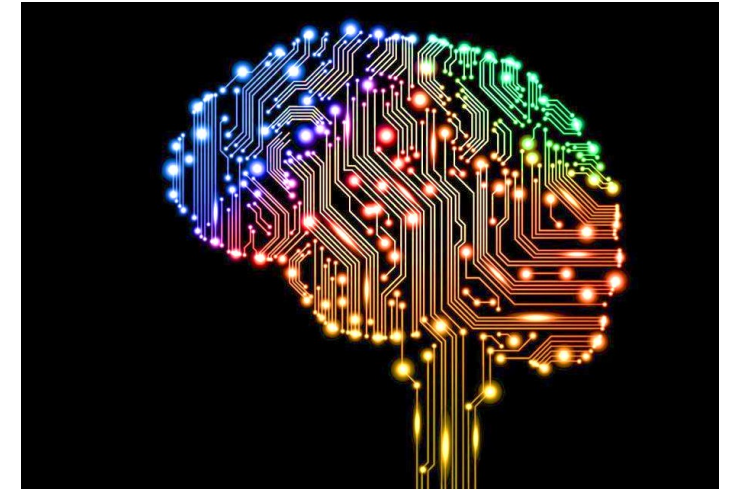


## Industrie 4.0 will transform manufacturing



## Growing Adoption

Across various reports, a high percentage (60% to 80%) of companies plan to deploy Industrie 4.0 solutions by 2020.



## Yet many still:

1. Lack familiarity with Industrie 4.0 concepts
2. Are unclear how to get started
3. Lack a systematic approach to identify opportunities and high-impact initiatives

# Industrie 4.0 Transformation Steps

- Security, Safety, Reliability, Biz Continuity
- QAQC, Project Risk Management
- Training



**03**  
STEP

## IMPLEMENTATION & OPERATION

- Smooth integration of new technologies
- Safe, secure and reliable operations
- Meet quality and performance targets

- I40 Roadmap, Business Case
- I40 Solutions
- Qualify Vendors and Technologies



**02**  
STEP

## SOLUTIONING

- Define targeted future state and state problem
- Determine business impact
- Specify solutions and vendors

- I40 Readiness Assessment
- Gap Analysis & Prioritisation Matrix
- Training



**01**  
STEP

## INITIATION

- Develop individual understanding of I40
- Create Baseline
- Identify Gaps

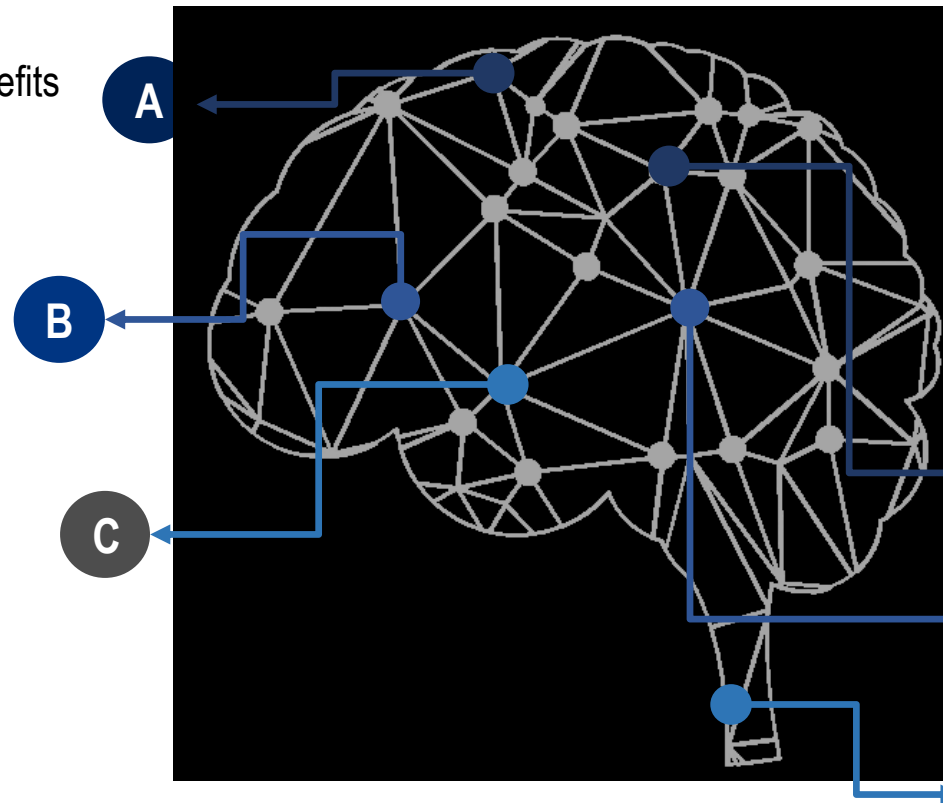
# Objective of the Index

## 01 To help companies start, scale and sustain their transformation initiatives

What is Industry 4.0 and the tangible benefits that it can yield for my company?

What is the Industry 4.0 maturity level of my organisation and manufacturing facility?

How can my company improve in a targeted and step-wise fashion?



## 02 Key considerations in the development of the Index:

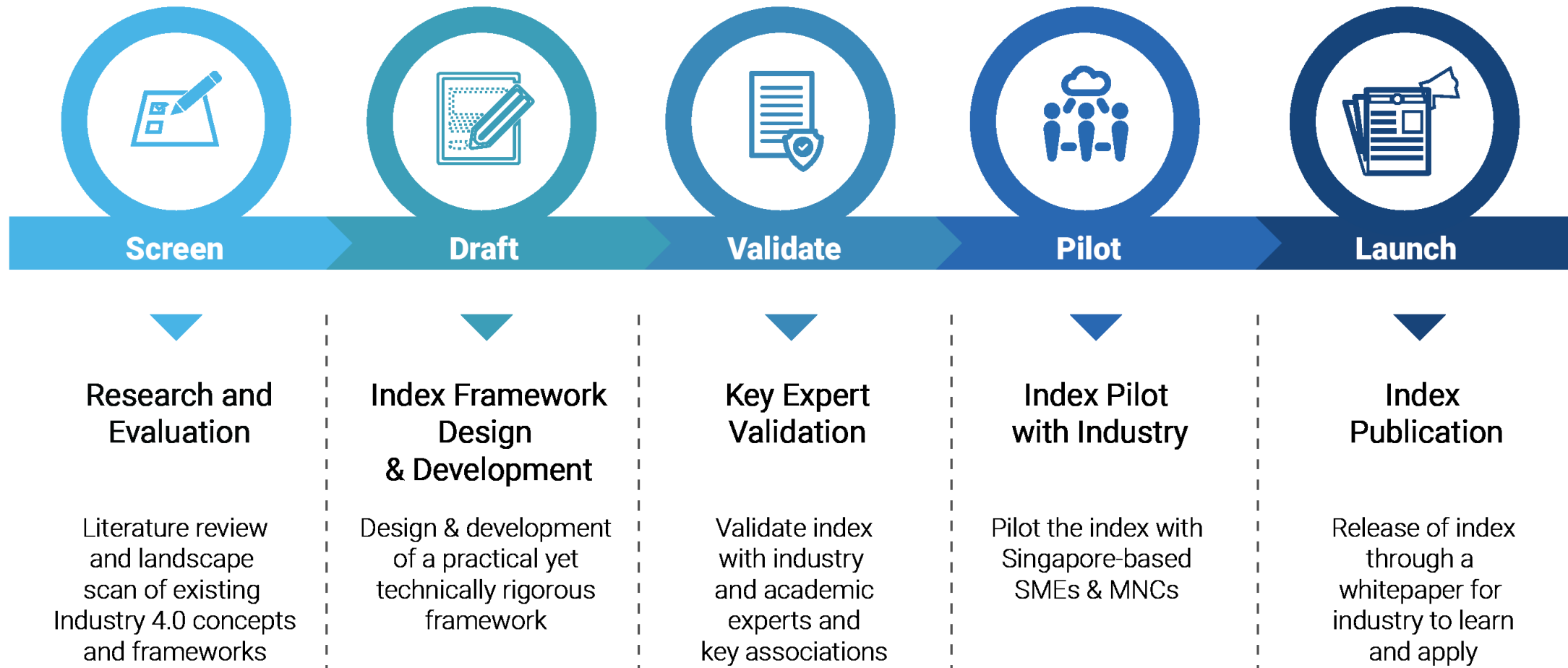
- A Comprehensive** to cover the key elements of Industry 4.0
- B Balance** between technical rigour & practical usability
- C Relevant to all companies**, regardless of industry, size, profile, and Industry 4.0

Source: The Smart Industry Readiness Index, Economic Development Board, 2017

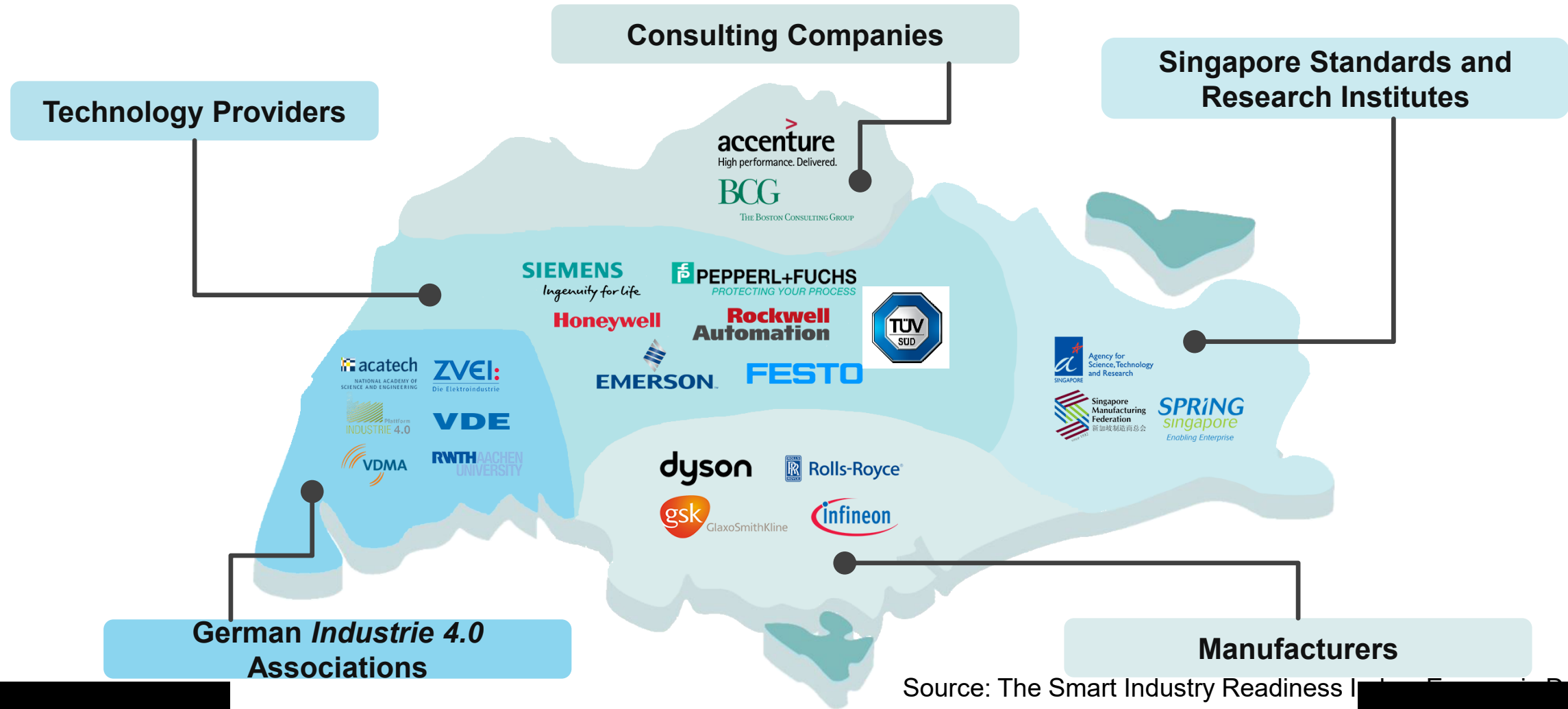




# Development Process of the Index



# Validated with global and local thought leaders from industry and academia



Source: The Smart Industry Readiness Index, February 2017

# The Index was piloted across MNCs & SMEs

Multi-National Corporations (MNCs)	Small and Medium Enterprises (SMEs)

Source: The Smart Industry Readiness Index - Economic Development





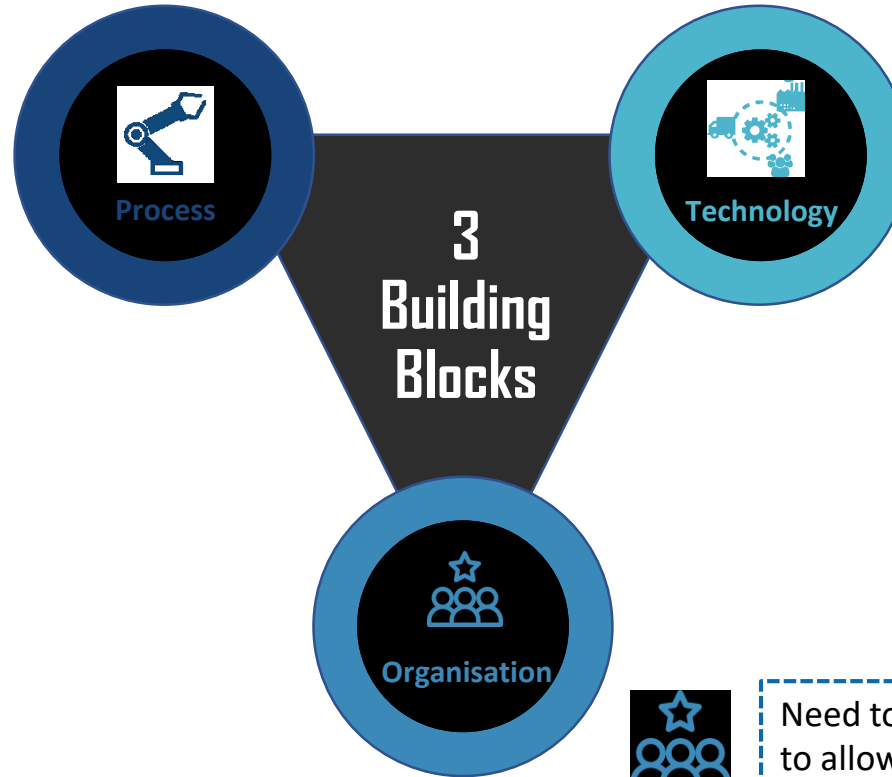
# The Index: 3 Building Blocks



**Process**

Using technology to digitize a poorly-designed process will only result in a poorly-designed digital process. Conversely, applying technology to a well-developed process will compound the amount of improvement.

Under Industry 4.0, the concept of process improvements has expanded beyond efficiency enhancement of individual processes, to include integration of multiple processes.



**Technology**

A cornerstone of every major industrial revolution and remains a critical pillar for Industry 4.0.

Advanced automation & digital technologies are necessary to drive the convergence of cyber-physical systems

**3 Building Blocks**

**Organisation**



**Organisation**

Need to adapt organizational structures and processes to allow the workforce to keep pace.

2 critical elements:

- (i) The people who make up the organization, and
- (ii) The institutional systems that govern how the

Source: The Smart Industry Readiness Index, Economic Development Board, 2017

# Comprehensive Approach to Address Complex Industrie 4.0



## Operations

The planning and execution of processes which lead to the production of goods & services



## Supply Chain

The planning & management of raw materials & inventory of a company's goods & services, from the point of origin to the point of consumption



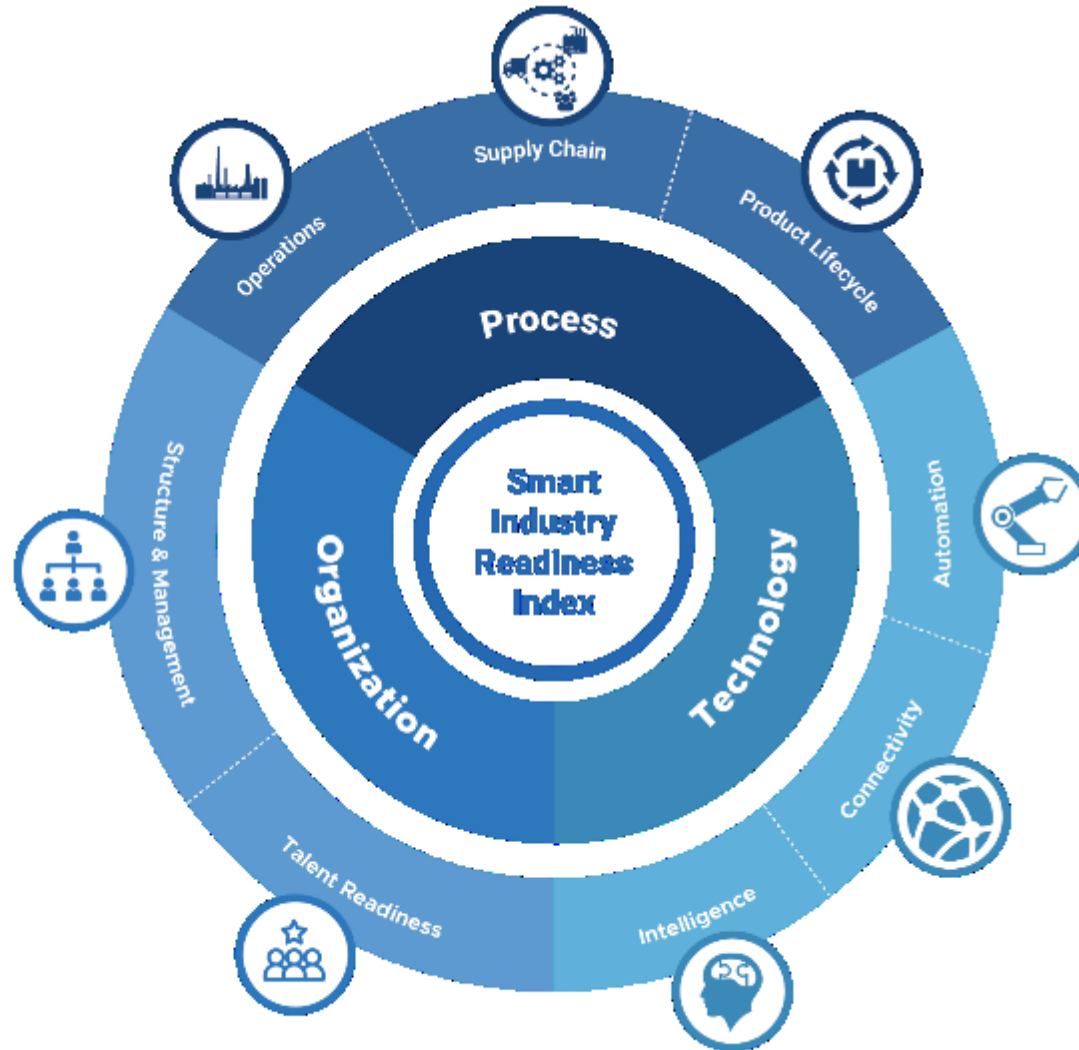
## Product Lifecycle

The sequence of stages that a product goes through, from its initial conceptualization to its eventual removal from the market



## Automation

The application of technology to monitor, control, & execute the production & delivery of products & services



## Connectivity

The state of interconnectedness between equipment, machines, & computer-based systems to enable communication & data exchange across assets



## Intelligence

The processing & analysis of data collected, to diagnose problems & identify opportunities for improvement



## Talent Readiness

The ability of the workforce to drive and deliver Industry 4.0 initiatives

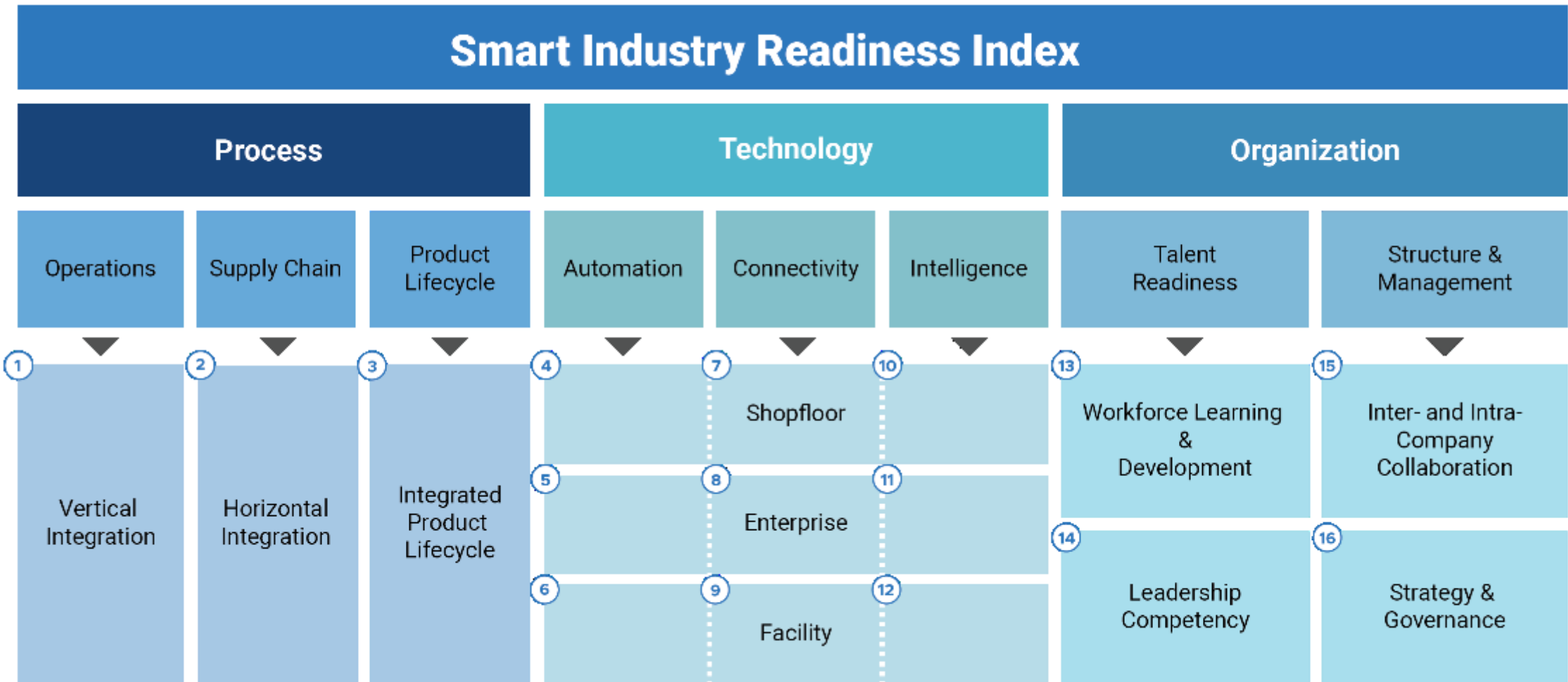


## Structure & Management

Strong leadership, supported by a clear strategy & governance framework, will enable firms to be more flexible, collaborative, & empowered to design & implement Industry 4.0 strategies

Source: The Smart Industry Readiness Index, Economic Development Board, 2017

# The Index: 16 Dimensions

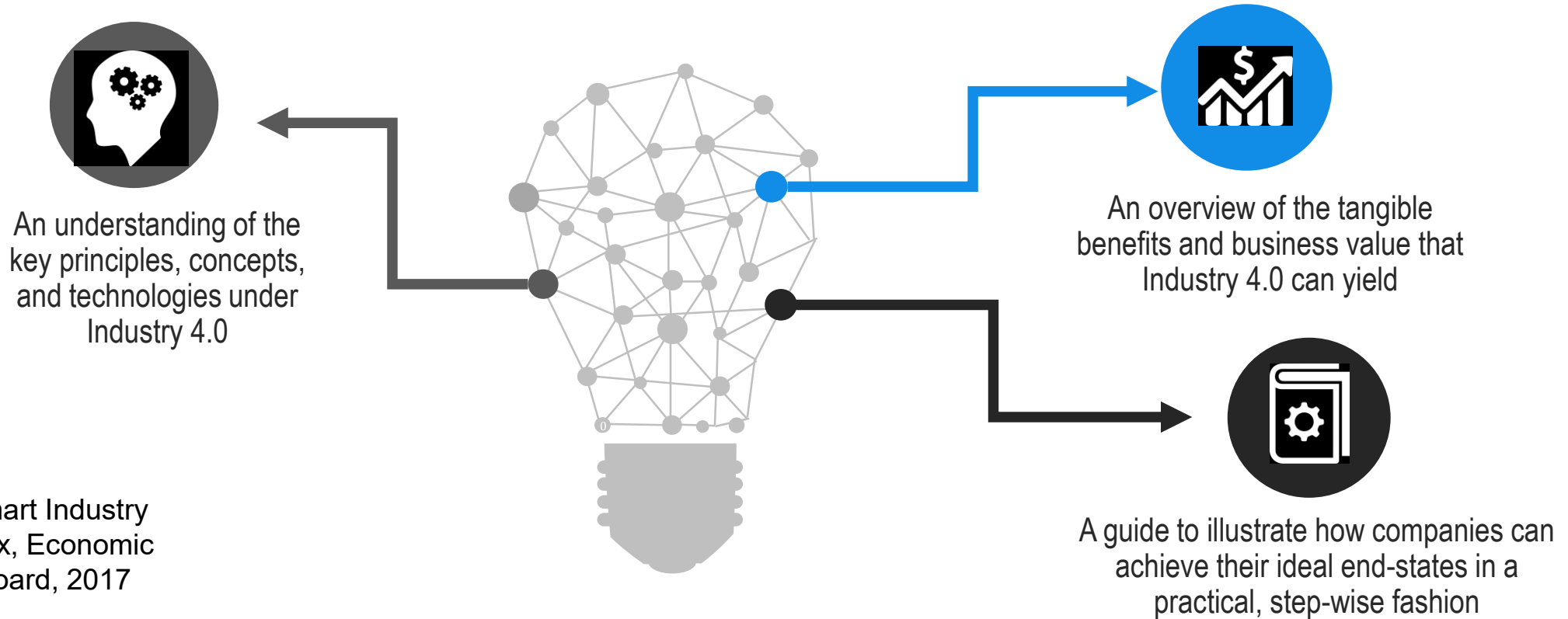


Source: The Smart Industry Readiness Index, Economic Development Board, 2017



# Learn key concepts and build a common language for alignment

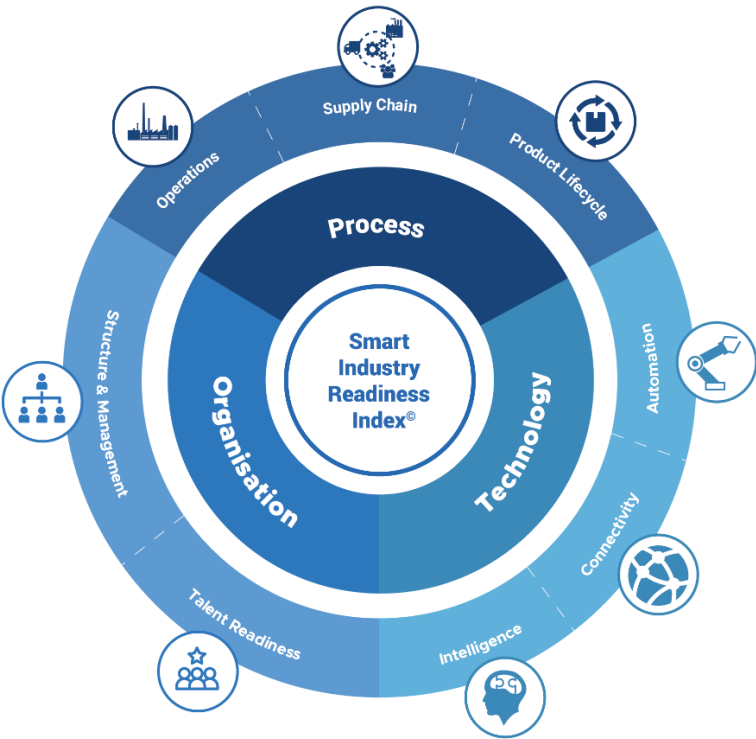
## 01 The Index will provide a base foundation to build knowledge:



Source: The Smart Industry Readiness Index, Economic Development Board, 2017

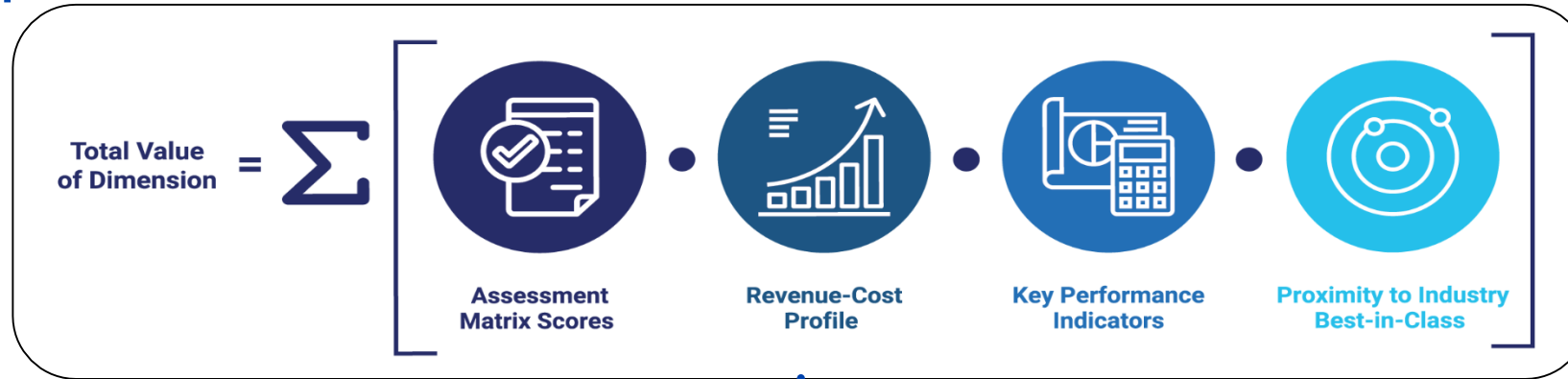
## 02 The Index will establish a common language amongst different stakeholders

# Sample Results (Current State)



		Prioritized Enablers						
		Bands						
Dimensions		0	1	2	3	4	5	
		Undefined	Defined	Digital	Integrated	Automated	Intelligent	
<b>Process</b>	1. Vertical Integration							
	2. Horizontal Integration							
	3. Integrated Product Lifecycle							
<b>Technology</b>	4. Shopfloor Automation	None	Basic	Advanced	Full	Flexible	Converged	
	5. Enterprise Automation							
	6. Facility Automation							
	7. Shopfloor Connectivity	None	Connected	Interoperable	Secure	Real-time	Scalable	
	8. Enterprise Connectivity							
	9. Facility Connectivity							
	10. Shopfloor Intelligence	None	Computerized	Visible	Diagnostic	Predictive	Adaptive	
	11. Enterprise Intelligence							
	12. Facility Intelligence							
	<b>Organization</b>	13. Workforce Learning & Development	Informal	Limited	Structured	Integrated	Adaptive	Forward looking
		14. Leadership competency	Unfamiliar	Limited	Informed	Semi-Depend	Independent	Adaptive
		15. Inter- & Intra- Company Collaboration	Informal	Communicating	Cooperating	Coordinating	Collaborating	Integrated
		None	Formalization	Development	Implementation	Scaling	Adaptive	

# Identify Gaps – The Prioritisation Matrix



		Undefined	Defined	Digital	Integrated	Automated	Intelligent
<b>Process</b>	1. Vertical Integration						
	2. Horizontal Integration						
	3. Integrated Product Lifecycle						
<b>Tech-nology</b>	4. Shopfloor Automation	None	Basic	Advanced	Full	Flexible	Converged
	5. Enterprise Automation						
	6. Facility Automation						
	7. Shopfloor Connectivity	None	Connected	Interoperable	Secure	Real-time	Scalable
	8. Enterprise Connectivity						
	9. Facility Connectivity						
	10. Shopfloor Intelligence	None	Computerized	Visible	Diagnostic	Predictive	Adaptive
	11. Enterprise Intelligence						
	12. Facility Intelligence						
<b>Organi-zation</b>	13. Learning & Development	Informal	Limited	Structured	Integrated	Adaptive	Forward looking
	14. Leadership competency	Unfamiliar	Passive	Involved	Driving	Forward Looking	Empowering
	15. Inter & Intra-Collaboration	Informal	Communicating	Cooperating	Coordinating	Collaborating	Integrated
	16. Strategy & Governance	None	Formalization	Development	Implementation	Scaling	Adaptive

Source: The Prioritisation Matrix, Economic Development Board, 2019

# SIRI AM and PM Whitepapers



EDB launched the Index and **Assessment Matrix** with TUV SUD back in November 2017. Since then, it has been piloted with over 220 companies.

The **Prioritization Matrix**, the second tool under SIRI was developed with McKinsey, SAP, Siemens and TUV SUD to help companies architect their implementation roadmap. It has been launched in Hannover 2019



McKinsey  
& Company

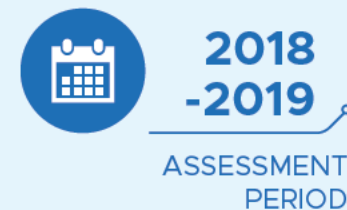
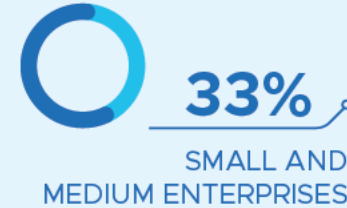
SIEMENS



<https://www.edb.gov.sg/en/news-and-events/news/advanced-manufacturing-release.html>

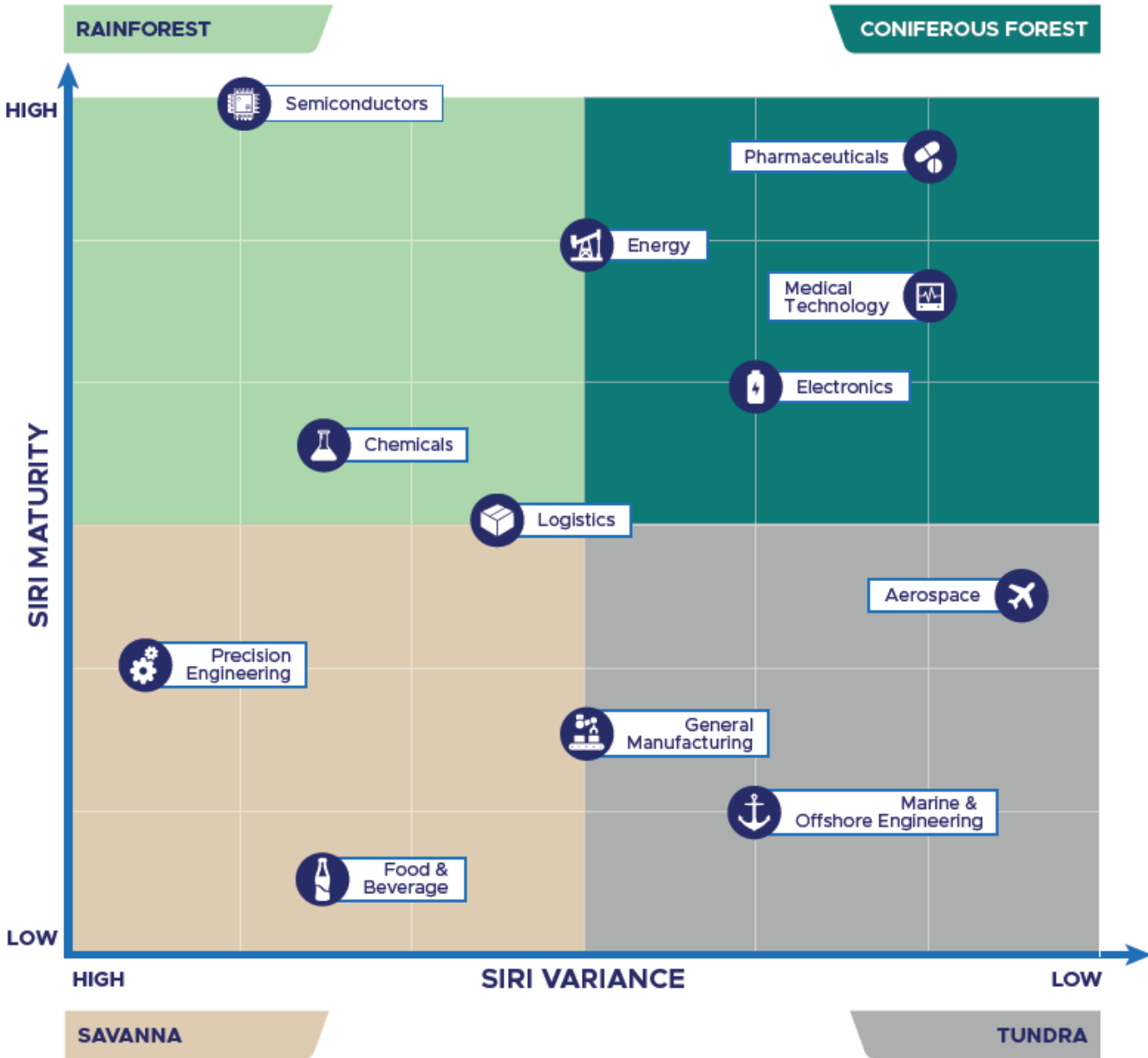
# Insights Report 2019

## Overview of Data Set



Source: The Smart Industry Readiness Index (SIRI) Manufacturing Transformation Insights Report 2019, Economic Development Board, Singapore, 2019

# Archetypes of Transformation



- Coniferous Forest:** Generally further along in their Industry 4.0 journeys. Similar in their pace of transformation.
  - Governments: ensure sectors' physical and social **infrastructure** enables constrain development.
- Tundra:** Face greater challenges in industrial transformation. Nature of products and manufacturing processes limit the ease of deploying I4.0 solutions.
  - Governments to **partner companies** to explore initiatives e.g. redesigning manufacturing process, enhancing workforce or training programs.
- Rainforest:** Most firms are ahead, but a small group has not kept pace.
  - Governments: identify the sources contributing to the high variance and then **support individually**.
- Savanna:** Most companies are in their early stage of transformation.
  - Government to **encourage companies** to pursue transformation using examples from Coniferous Forest.

Source: The Smart Industry Readiness Index (SIRI) Manufacturing Transformation Insights Report 2019, Economic Development Board, Singapore, 2019

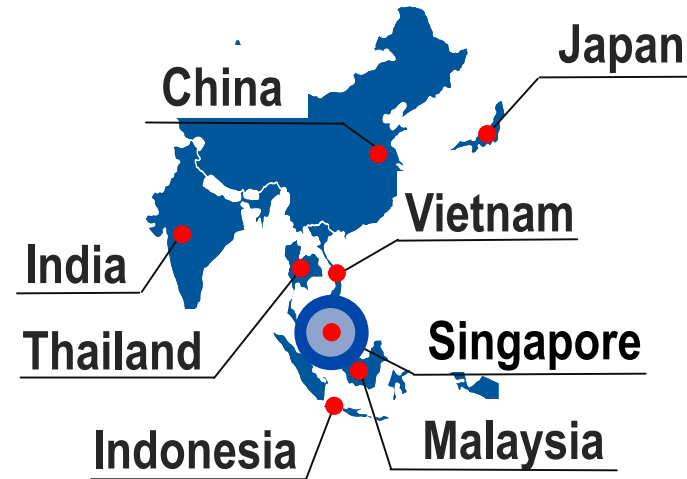
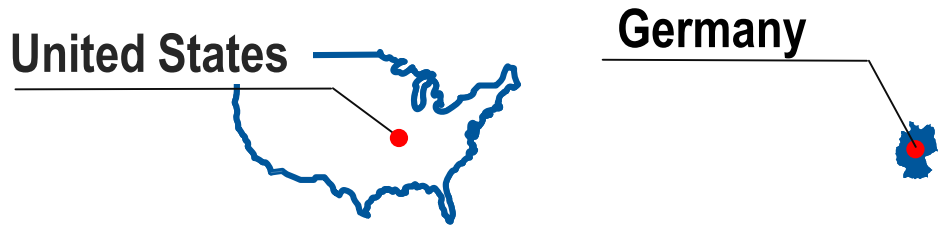
Figure 3 The four Archetypes of Transformation

# SIRI - Global Adoption

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# Global Adoption – SIRI has become De-Facto Standard



- I40 Headquarter
- Strategic Engagement



**230+**  
Companies consulted



**>30**  
Experts  
(Industry 4.0 Assessors and Consultants)



**4**  
Industries  
(Manufacturers, Logistics, Utilities, Service Providers)





Choose certainty.  
Add value.

# Thank You

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