

# SMART FACTORIES IN VIETNAM



# CONTENTS

## Chapter

I

## Research overview

1. Research overview Page 3

## Chapter

II

## Smart Factory overview – Global background

1. The world's history Page 5
2. What is Smart Factory? Page 6
3. Global movements Page 8

## Chapter

III

## Vietnam Smart Factory assessment

1. Analysis approach – PEST Page 13
2. PEST – Politics Page 14
3. PEST - Economy Page 16
4. PEST - Society Page 20
5. PEST - Technology Page 21
6. PEST result Page 24

## Chapter

IV

## Vietnam Smart Factory market trends

1. Market size & Forecast Page 26
2. Smart Factories in Vietnam Page 27
3. Korean participation Page 35

## Chapter

V

## Research summary

1. Summary Page 39

# 01 Research overview

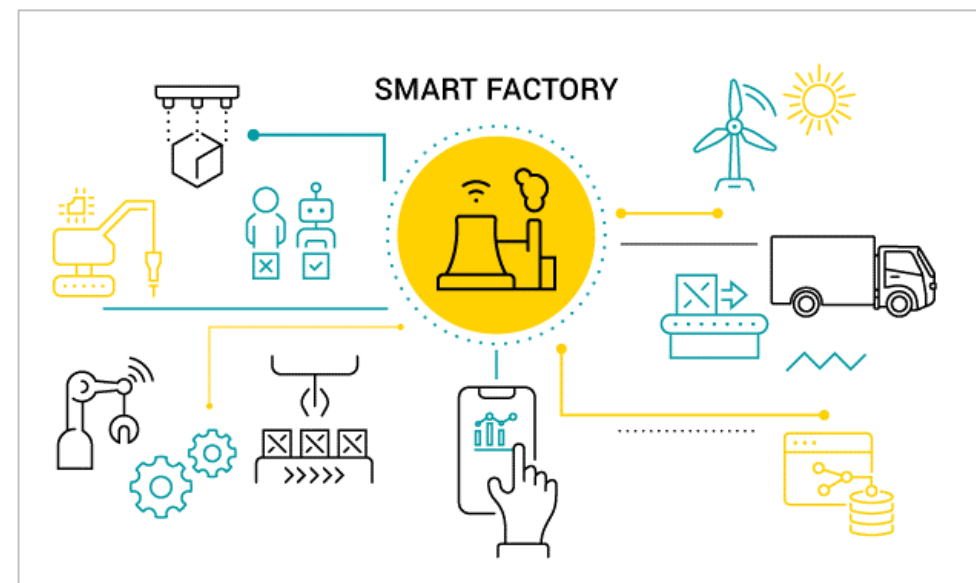
## Objectives & Methods

- High-tech adoption and embracement has become phenomenal in business sectors in order to keep up with the wave of the Industry 4.0. To increase the productivity and stay competitive, digital transformation is not an option but an inevitable decision for all entities, regardless of size or industry
- Technological advancements, i.e IoT (Internet of Things) has led to the emerge of automation, integration and synchronization. From smart phones, smart homes, the trend has magnified to **smart factories**, referring to the combination and utilization of different technologies and digitization to create a streamlined manufacturing process with an optimal performance, efficiency while reducing waste of resources
- As Vietnam is known of an attractive destination for foreign investment capital, as well as a number of new industrial zones have been opened across the country, it is worthy to address the movement of smart factories in Vietnam. Therefore, this research will focus to outline an overall picture and to answer these main questions:

- ❑ *Smart Factory concept?*
- ❑ *Overview in Vietnam (e.g. Volume, Policies, Large factories / companies etc.)*
- ❑ *Assessment of Smart Factory potential in Vietnam*
- ❑ *Major key stakeholders participation and forecast in Vietnam (e.g. Korea, US, other countries etc.)*
- ❑ *Additional research*

- **Methodology:**

- ❑ Mainly from desk research, press search, data collection & synthetization from company websites



# CONTENTS

## Chapter

I

## Research overview

1. Research overview Page 3

## Chapter

II

## Smart Factory overview – Global background

1. The world's history Page 5
2. What is Smart Factory? Page 6
3. Global movements Page 8

## Chapter

III

## Vietnam Smart Factory assessment

1. Analysis approach – PEST Page 13
2. PEST – Politics Page 14
3. PEST - Economy Page 16
4. PEST - Society Page 20
5. PEST - Technology Page 21
6. PEST result Page 24

## Chapter

IV

## Vietnam Smart Factory market trends

1. Market size & Forecast Page 26
2. Smart Factories in Vietnam Page 27
3. Korean participation Page 35

## Chapter

V

## Research summary

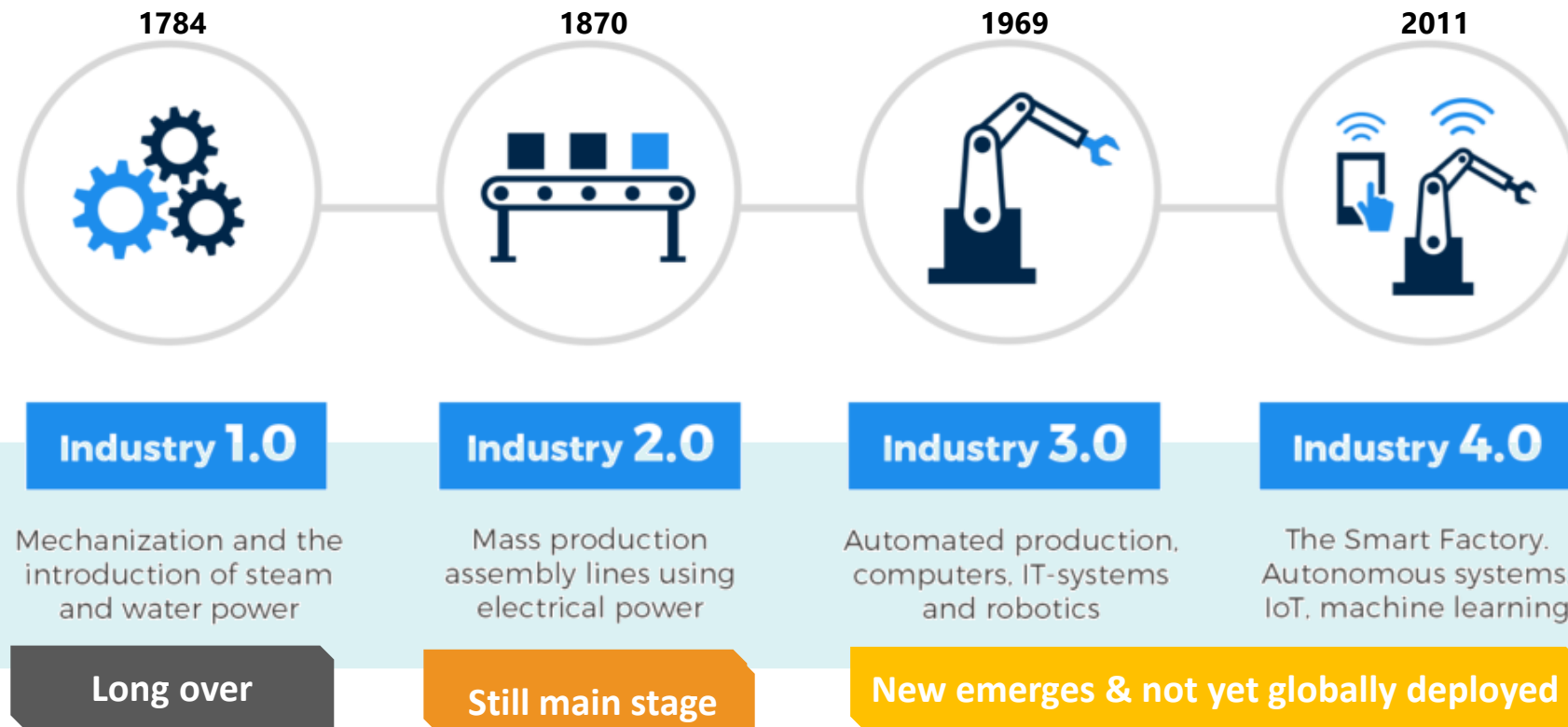
1. Summary Page 39



## 01 The world's history Industrial revolutions

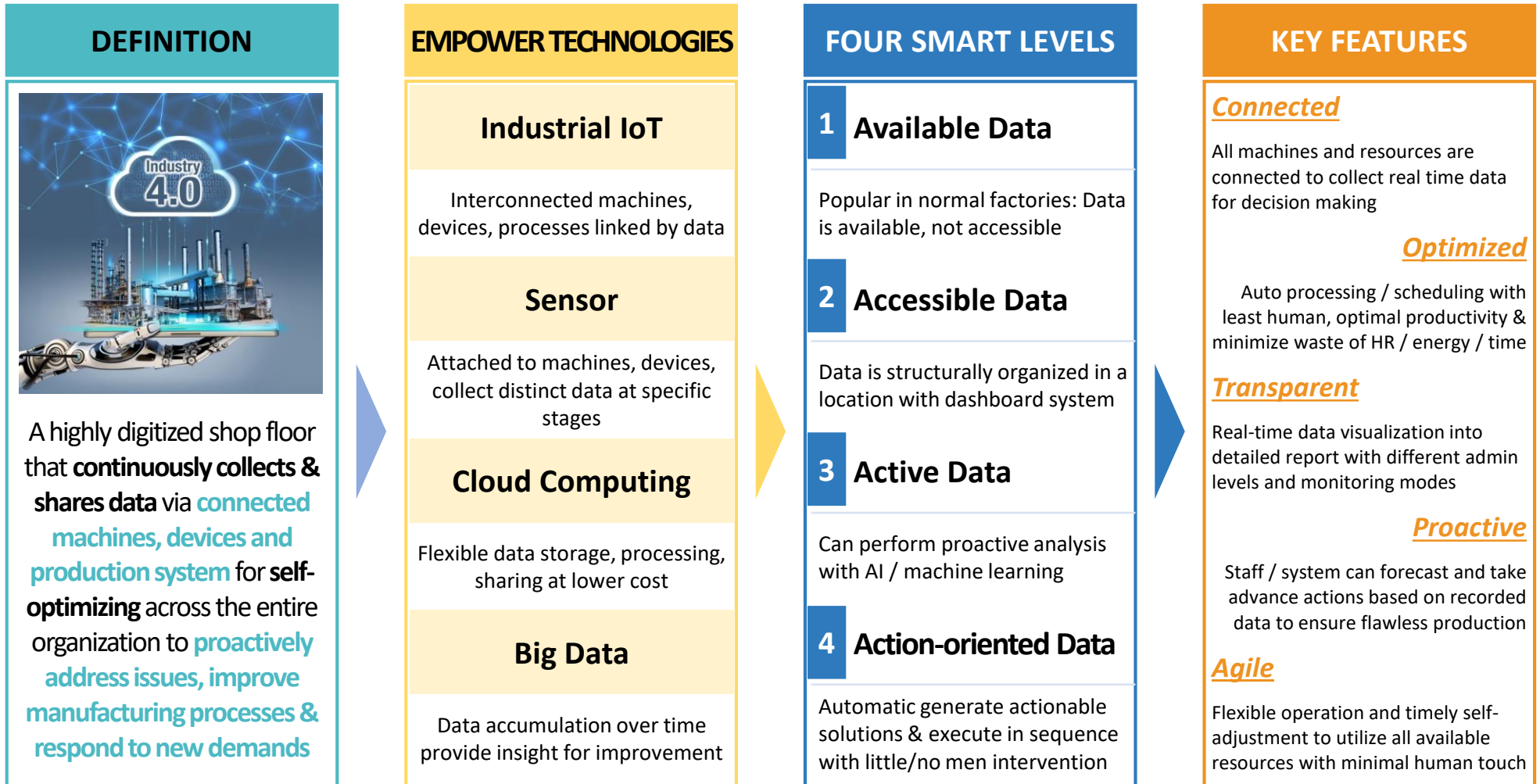
- Smart Factory is explicitly addressed in the core of the Industry 4.0 along with Autonomous system / IoT / Machine learning
- However, as the 4.0 is on the way, the deployment is obviously discrepant around the world. In fact, in many developing economies, Industry 2.0 is still dominant and under the transformation to 3.0

### The Four Industrial Revolutions



## 02 What is Smart Factory? General concept

- The ultimate Smart Factory aims at a self-operating plant with the evolvement capability along the way, which enables the automation, forecasting and self-adjustment in nearly real-time without human intervention

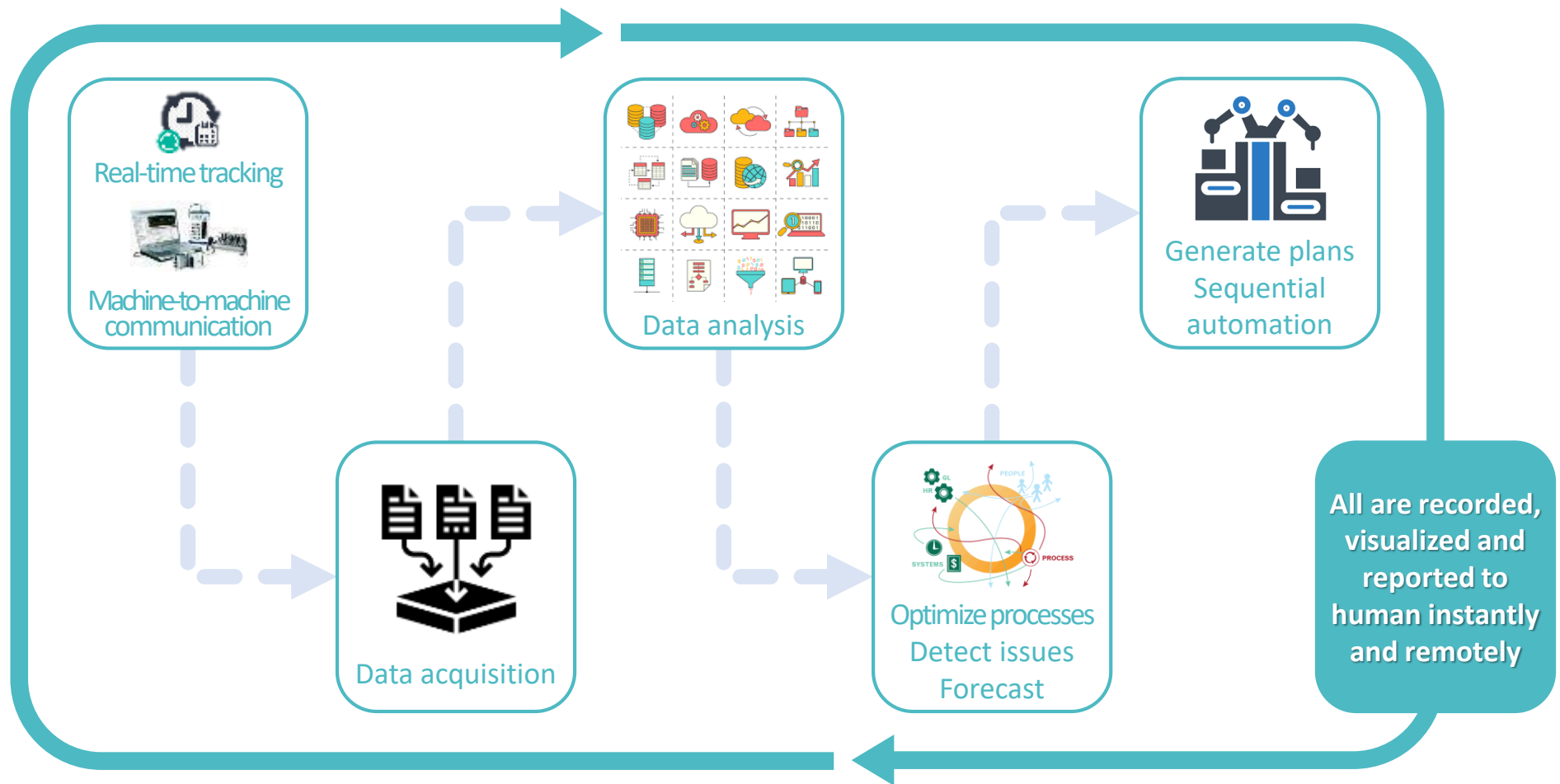


## 02 What is Smart Factory?

### General concept

#### What happens inside a Smart Factory

- Ideally, Smart Factory will perform in a closed manufacturing process in which everything is almost automated with the highest efficiency and eliminates manual work as much as possible

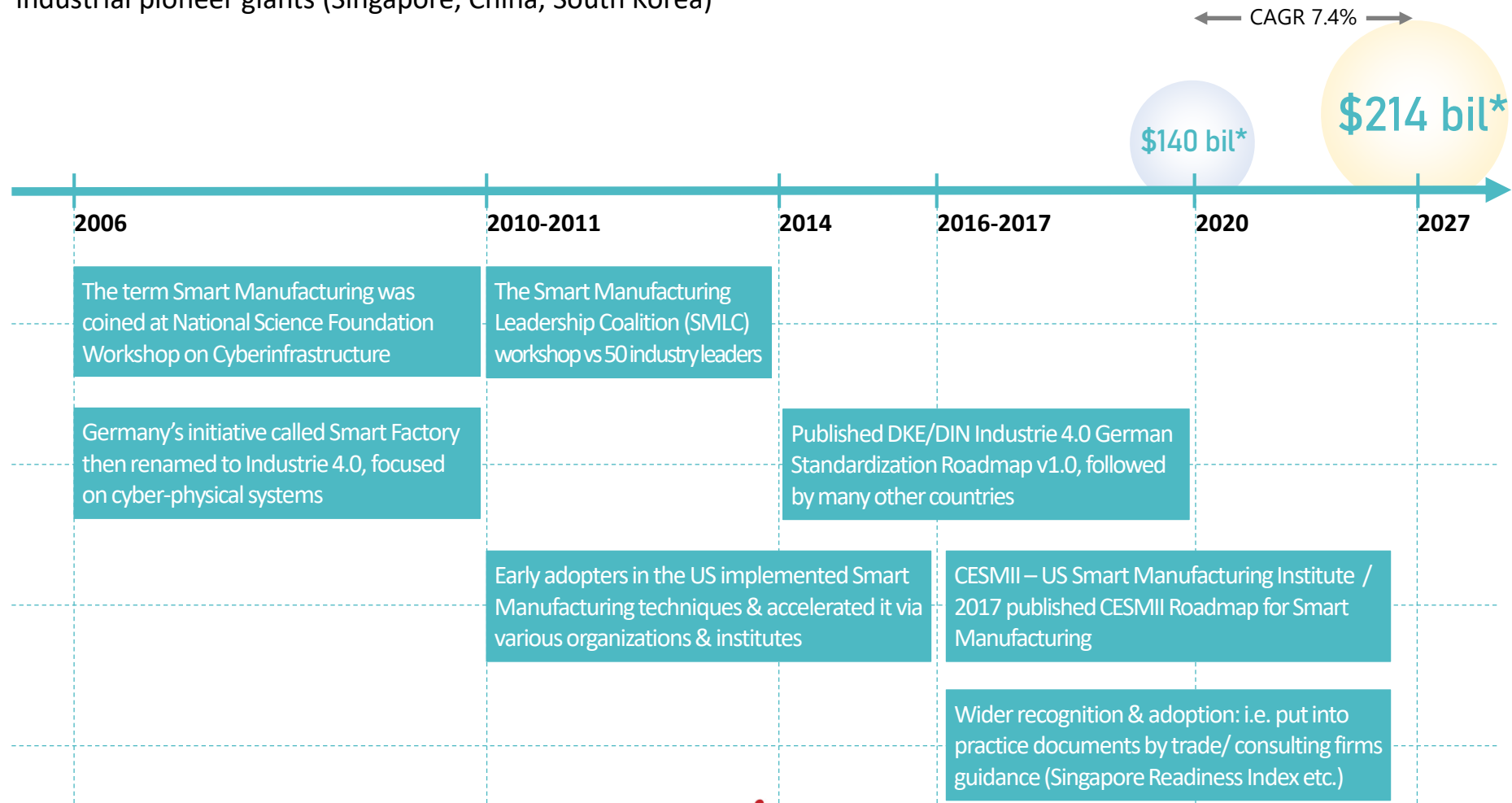


## 03 Global movements

### Term initiation

The term Smart Factory was coined 15 years ago...

- Since officially introduced 15 years ago, Smart Factory has been step-by-step adopted in manufacturing industry
- The West (US, Europe...) are early adopters, then the trend has expanded tremendously to other developed countries with industrial pioneer giants (Singapore, China, South Korea)

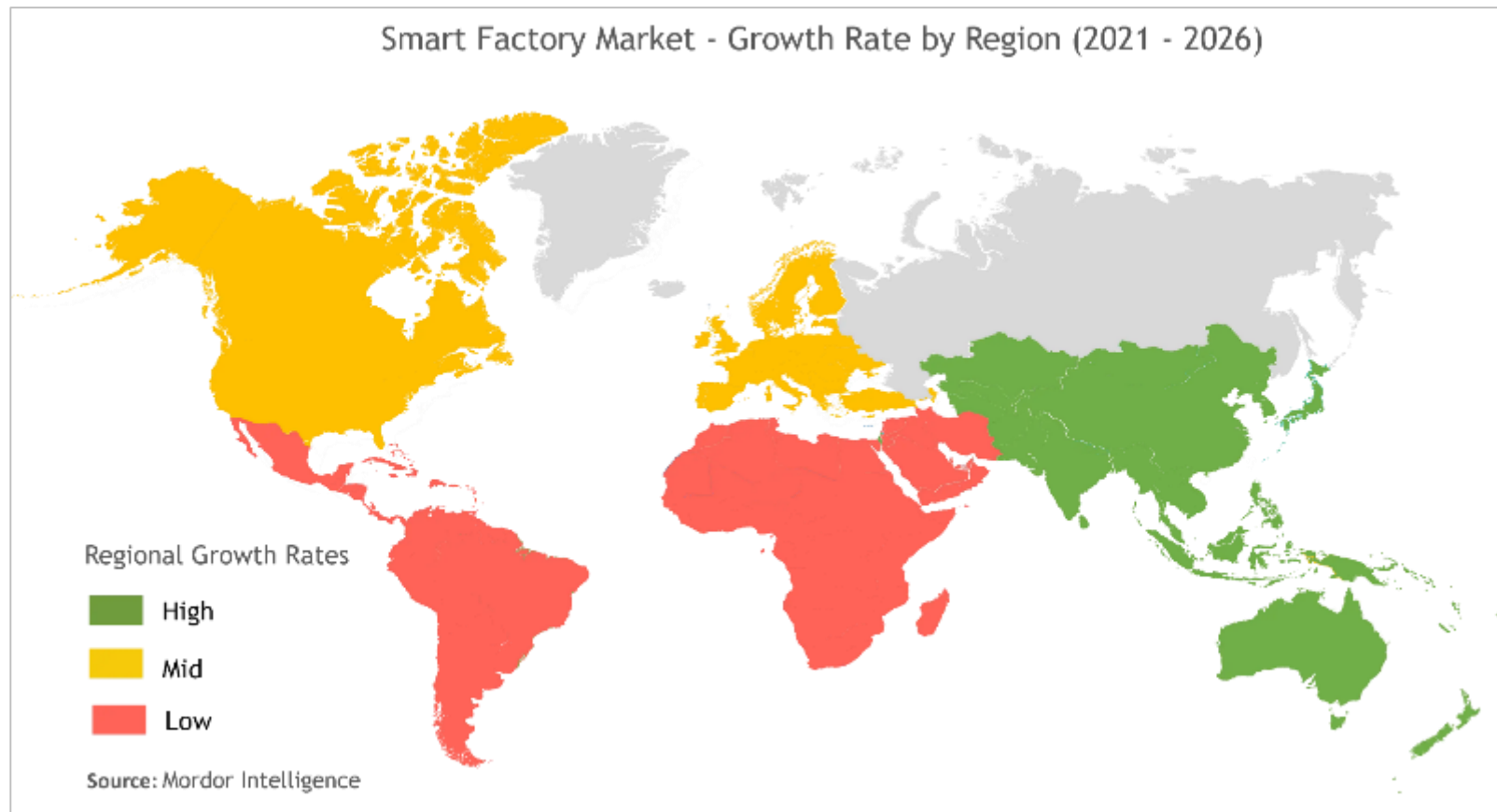




## 03 Global movements

### Global development

- Asia Pacific has emerged as a hot spot for manufacturing investment, since many large manufacturers have been moving plants there to exploit local resources and reduce production costs
- As a result, it is forecast that new waves of Smart Factories will be concentrated in those regions than old barren Western continents

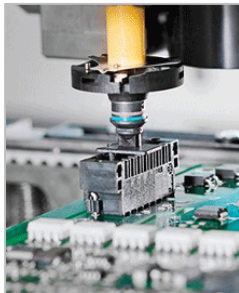
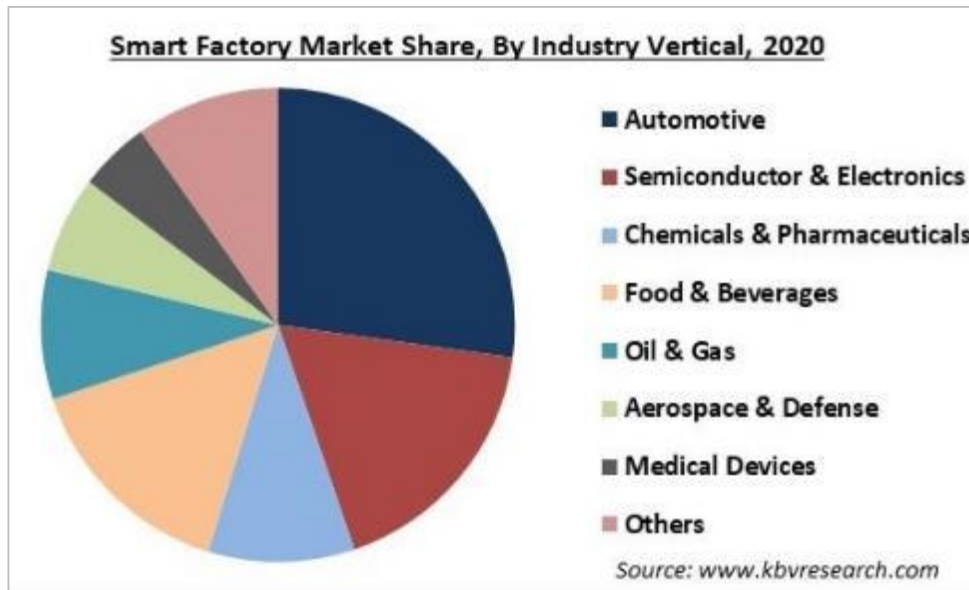


## 03 Global movements

### TOP Smart Factories

#### Breakdown by industry vertical & some biggest corporations

- It's easy to see precision manufacturing (e.g automotive, electronics, industrial production etc.) is early and aggressive Smart Factory adopters
- Besides, it's worth noted that F&B is a rising section for Smart Factory



#### TOP COMPANIES DEPLOYING SMART FACTORIES

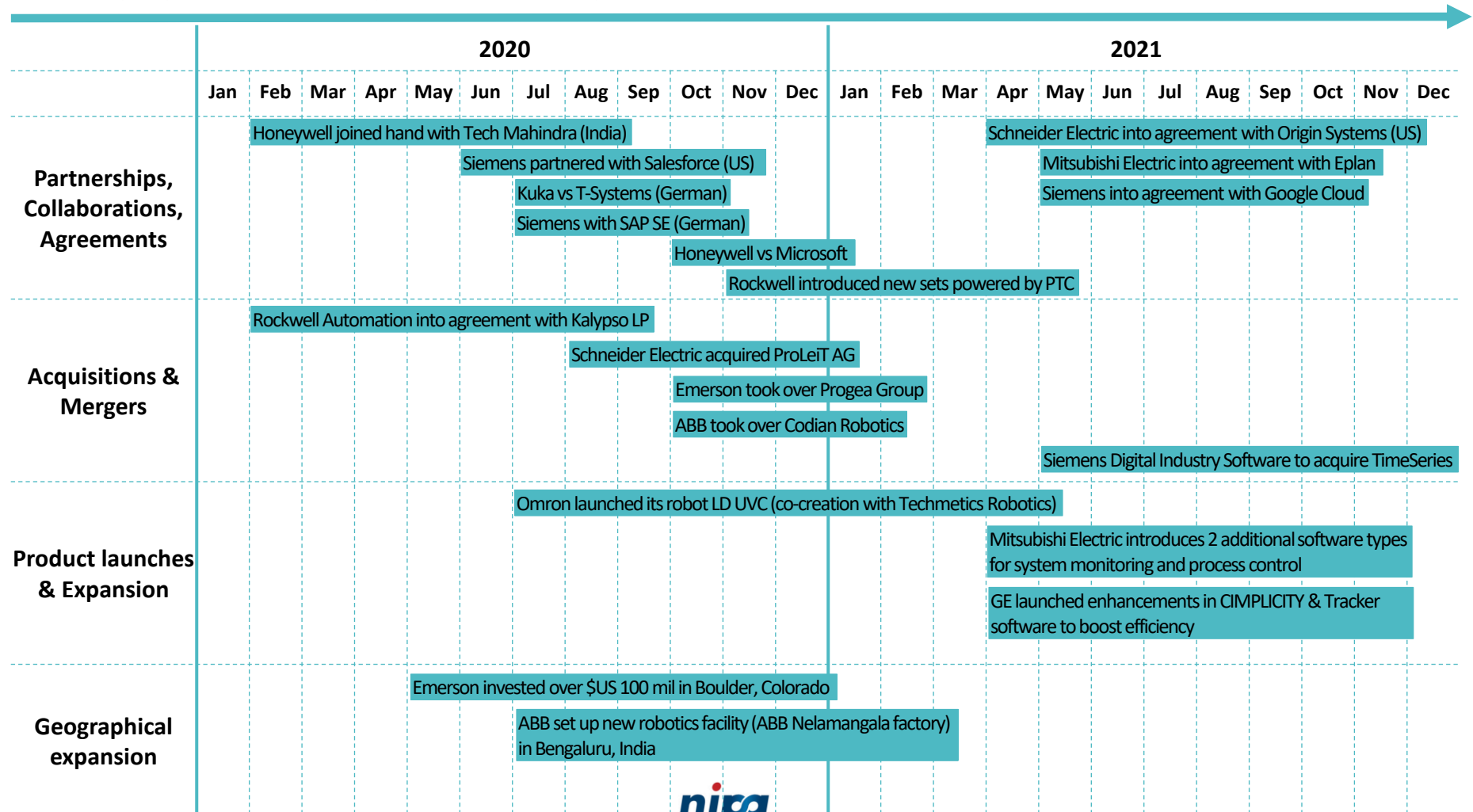
- Siemens AG
- ABB Ltd.
- Honeywell International, Inc.
- Yokogawa Electric Corp.
- General Electric Company
- Emerson Electric Company
- Schneider Electric
- Rockwell Automation Inc.
- Robert Bosch GmbH
- Fanuc Corp.
- Mitsubishi Electric
- Omron
- Kuka AG

## 03 Global movements

### Latest updates

#### Recent activities in last 2-3 years

- Despite the pullback by the pandemic, global manufacturing giants are still:
  - 1) actively partnering or acquiring IT power
  - 2) investing capital / establishing local facilities, especially in hot destinations (such as APAC)



# CONTENTS

<b>Chapter</b>	<b>I</b>	<b>Research overview</b>
1.	Research overview	Page 3
<b>Chapter</b>	<b>II</b>	<b>Smart Factory overview – Global background</b>
1.	The world's history	Page 5
2.	What is Smart Factory?	Page 6
3.	Global movements	Page 8
<b>Chapter</b>	<b>III</b>	<b>Vietnam Smart Factory assessment</b>
1.	Analysis approach – PEST	Page 13
2.	PEST – Politics	Page 14
3.	PEST - Economy	Page 16
4.	PEST - Society	Page 20
5.	PEST - Technology	Page 21
6.	PEST result	Page 24
<b>Chapter</b>	<b>IV</b>	<b>Vietnam Smart Factory market trends</b>
1.	Market size & Forecast	Page 26
2.	Smart Factories in Vietnam	Page 27
3.	Korean participation	Page 35
<b>Chapter</b>	<b>V</b>	<b>Research summary</b>
1.	Summary	Page 39

# 01 Analysis approach

## PEST model

- Smart Factory in Vietnam will be assessed through 4 elements of PEST model (Politics, Economy, Society, Technology)

### Politics

Measure the degree of political stability & government intervention in economy:

- ☐ Legal framework; Current / Future laws & regulations
- ☐ Tax policies & Incentivization schemes
- ☐ Ease of doing businesses
- ☐ Political stability
- ☐ Etc.

### Economy

Economic policies & factors that have great impacts on businesses & their expansion:

- ☐ Stage of business cycle / GDP / GNP...
- ☐ Changes in economic environment (macro / micro)
- ☐ Labor costs
- ☐ Impacts of globalization
- ☐ Etc.



### Technology

Level of reception and application of new / high-tech in production / consumption:

- ☐ R&D activities
- ☐ Impact of emerging technologies / emerging transfer
- ☐ Technology diffusion / disruption
- ☐ Government & industrial investment
- ☐ Etc.

### Society

Typical traits in demographics, culture that impact on national trends & business transformation:

- ☐ Population / Labor growth
- ☐ Labor workforce qualification and readiness
- ☐ Economic disparity
- ☐ Digital disparity
- ☐ Etc.



## 02 PEST - Politics

### Government direction (1)

- Apparently, Vietnam government has been issuing regulations to complete a legal framework in order to escalate the Industry 4.0 and digital transformation. However, all documents coming into effect quite recently are still **general direction and lack specific instruction or detailed support / incentivization schemes**

Time	Document	Related regulation
01/2021	<b>Decision No. 127/QĐ-TTg</b> National strategy on research, development and application of AI until 2030	➤ Push the deployment of AI in industrial production to upgrade smart manufacturing, automation to increase quality and productivity
12/2020	<b>Decision No. 2289/QĐ-TTg</b> Adopting national strategy for 4 <sup>th</sup> Industry Revolution by 2030	➤ Focus to build a complete macro environment (legal framework, infrastructure etc.) for Industry 4.0, prioritize innovative technologies e.g robotics, AI, IoT etc.
06/2020	<b>Decision No. 749/QĐ-TTg</b> Program for national digital transformation by 2025 and towards 2030	➤ Support SME, traditional craft businesses, manufacturing businesses shifting to smart production, including smart factory, smart strategy, smart operation
04/2020	<b>Resolution No. 50/NQ-CP</b> Specify main tasks to accomplish objectives of Politburo's Resolution No.52-NQ/TW	➤ Assign Ministry of Industry and Trade (MOIT) to build plan to support businesses to apply 4.0 technologies and smart manufacturing during 2021-2030
09/2019	<b>Resolution No. 52-NQ/TW</b> Main orientations and policies to actively participate in Industry 4.0	➤ Prioritize & incentivize hi-tech, innovative industries, smart manufacturing, targeting to turn Vietnam into a hub of smart manufacturing & services by 2045
03/2018	<b>Resolution No. 23-NQ/TW</b> Orientation for developing national industry by 2030 and towards 2045	➤ Identify target industries; speed up integration & automation to create smart manufacturing, smart factory; build policies for smart manufacturing
11/2014	<b>Decision No. 66/2014/QĐ-TTg</b> List of hi-tech prioritized and eligible for development and promotion	➤ 4.0 technologies (e.g. AI, robot, automation etc.) are listed as prioritized / eligible for development investment and promotion

## 02 PEST - Politics

### Government direction (2)

- Vietnam government and relevant agencies are step-by-step addressing and establishing the foundation for Industry 4.0 and Smart Factory. As Vietnam starts slower than other countries, this is just the beginning stage, it will take time for the completion of policies and implementation

#### Some key direction and action plans towards building Industry 4.0 and Smart Factory in Vietnam

**To build a set of 4.0 Smart Industry Readiness Index** (similar to Singapore, Indonesia etc.)

*“ Vietnam has researched and built an assessment tool called ViPA (Vietnam Innovation Productivity Assessment) with 16 indicators divided into 4 main pillars: Enterprise management, Productivity management, Infrastructure for digital transformation, Smart manufacturing. >300 enterprises have self-evaluated via ViPA”*

**To build policies to support & stimulate smart manufacturing in businesses**

*“ Activities to support enterprises have been deployed, however, they initially focus on providing information, guidance in parallel with R&D, technology transfers to some pioneering projects in hi-tech. Strong incentivization, investment or funding are not yet popular to access (both in terms of policies and actual programs)”*

**To learn lessons from Smart Factory deployment model in other countries** (e.g Singapore, Korea etc.)

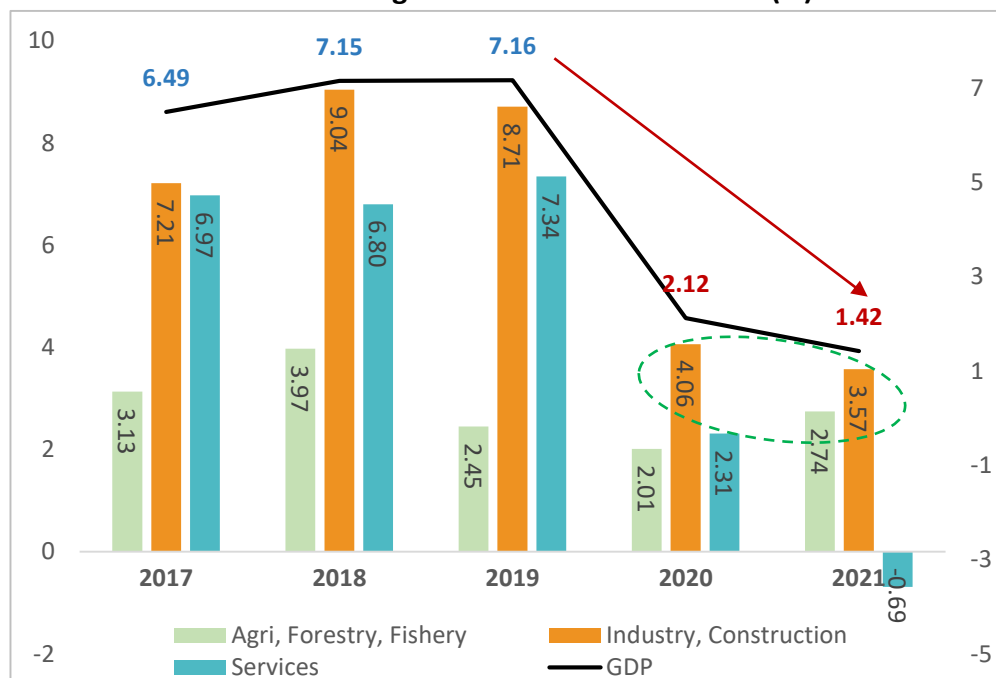
*“ According to MOIT and government, Korea’s Smart Factory model can be suitable preference for Vietnam to learn from, aside others from Germany, Japan, Singapore. In specifics, Vietnam should learn from Korea to build a master plan on the total scheme of Smart Factory with operating technology (OT) and clear sets of KPIs*

# 03 PEST - Economy

## Economy quick glance (1)

- COVID-19 obviously has delivered huge impacts to the economy in last 2 years, especially in service sector
- Optimistically, manufacturing still remains as one driving force in Industry & Construction with 32% of total 9-month GDP (Service = 40%, Industry & Construction = 38%, Agri / Forestry / Fishery = 12%)
- Despite that, some key industries e.g. beverages are affected more than others

9-month GDP growth rate over 2017-2021 (%)



9-month Index of Industrial production (IIP) decrease/increase rate (%)

SOME KEY INDUSTRIES	2017	2018	2019	2020	2021
Manufacture of basic metal	19.1	19.7	36.7	4.6	28.4
Manufacture of computer, electronic and optical products	30.0	14.2	6.3	9.1	7.7
Manufacture of wearing apparel	8.8	10.9	8.4	-5.5	4.8
Manufacture of leather and related products	7.8	10.5	8.9	-4.1	4.5
Manufacture of fabricated metal products, except machinery and equipment	8.5	13.8	6.5	3.7	3.4
Manufacture of other non-metallic mineral products	5.2	11.4	7.9	1.3	2.0
Manufacture of chemicals and chemical products	6.6	6.0	6.4	7.6	-1.1
Manufacture of other transport equipment	9.4	5.7	-5.8	-9.3	-1.9
Printing and reproduction of recorded media	8.8	7.6	11.8	-2.1	-2.2
Manufacture of beverages	4.6	8.2	11.0	-6.2	-4.2
Extraction of crude petroleum and natural gas	-10.9	-4.9	-2.4	-11.2	-12.4

4<sup>th</sup> wave of COVID-19 resulted in nearly 4-month lockdown in the South

### 9-month enterprise new registration:

117.8 thousand = 11.8% decrease compared to 2020

### 9-month enterprise withdrawal / suspension / bankruptcy:

90.3 thousand = 10% increase compared to 2020

### Provinces with highest IIP increase: (mainly from North to Central)

Ninh Thuan, Dak Lak, Hai Phong, Nghe An, Gia Lai, Ha Tinh, Thanh Hoa

### Provinces with highest IIP decrease: (mainly in the South)

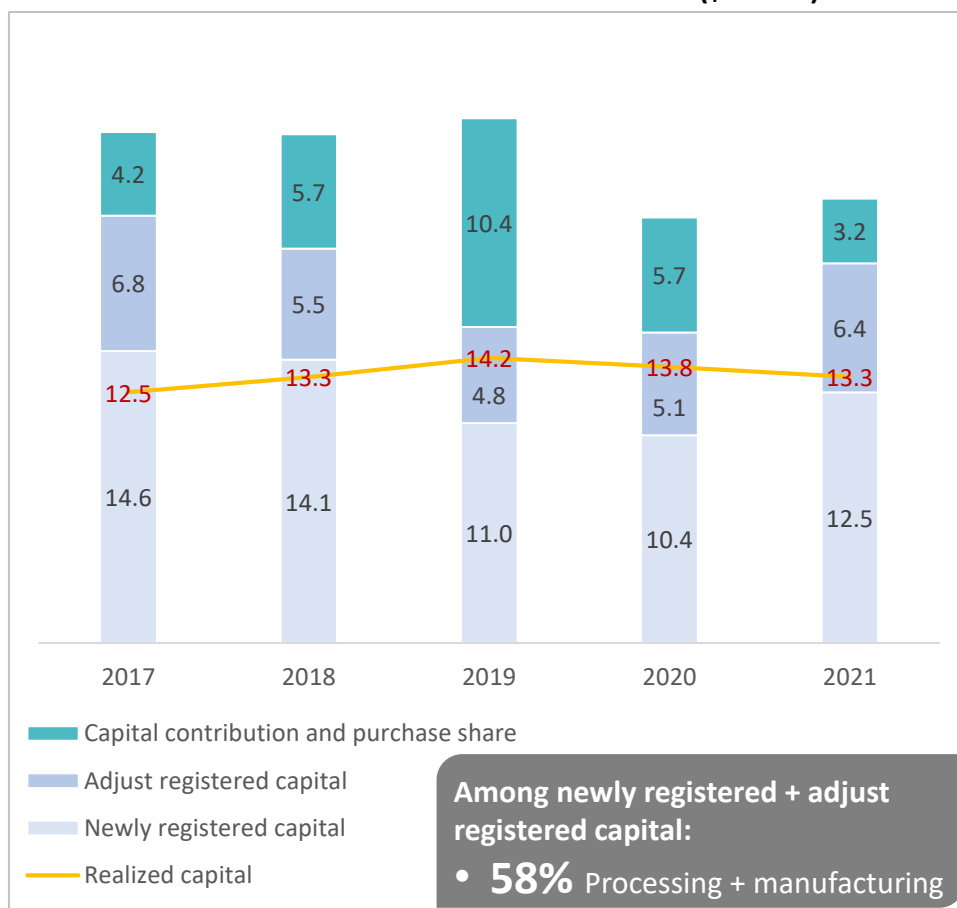
HCMC, Ben Tre, Dong Thap, Can Tho, Khanh Hoa, Tra Vinh

## 03 PEST - Economy

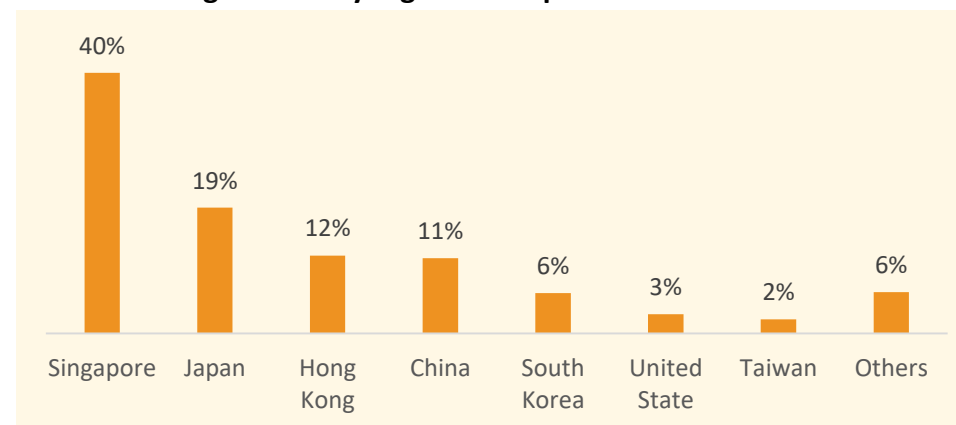
### Economy quick glance (2)

- Although witnessing some decrease compared to 2019, new registered FDI amount in 2021 is slightly higher than 2020. That is a good sign for the economy, in contrast to the worries that foreign countries would withdraw capital after a long lock down in many key provinces

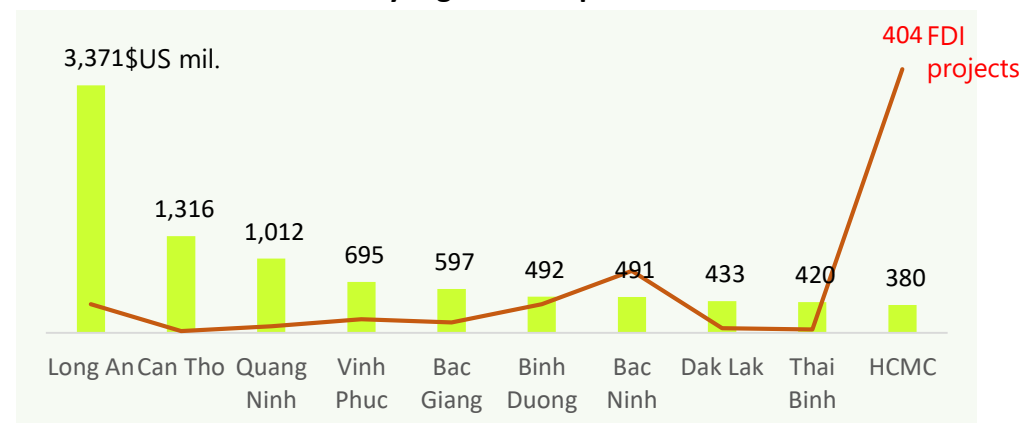
9-month FDI in Vietnam over 2017-2021 (\$US bil.)



Origin of newly registered capital – 9 months 2021



Destination of newly registered capital – 9 months 2021

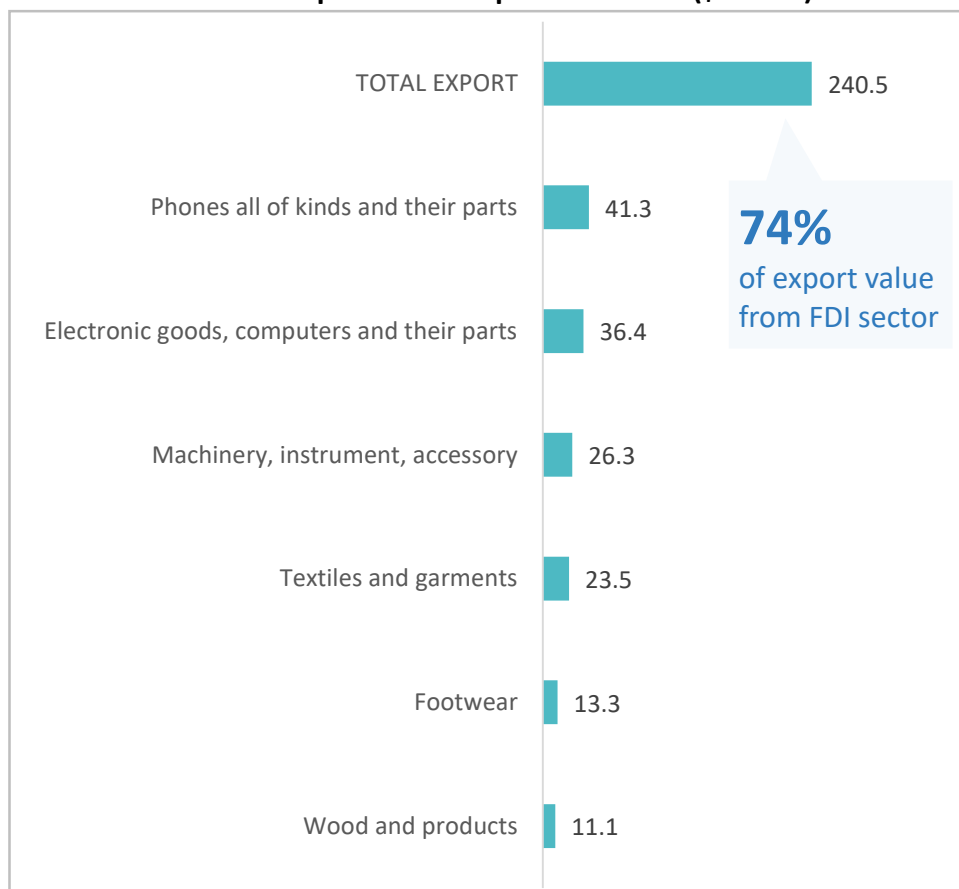


## 03 PEST - Economy

### Key manufacturing industries

- With a number of trade agreements coming into effect, Vietnam gains huge opportunities for export to major markets such as Europe. However, key products still are manual produced. Electronics and Automotive are sectors with promising gates for high-tech adoption

9-month export of some products 2021 (\$US bil.)



Some Vietnam's key manufacturing industries



#### Electronics

- ❖ TV, smartphone, processor, chip, appliance etc.
- ❖ Many big foreign investors: Samsung, Intel, Microsoft, LG, Panasonic etc.



#### Garment & Textile

- ❖ Vietnam = 2<sup>nd</sup> world largest exporter (2020) with export value of 29 \$US bil.



#### Footwear

- ❖ Vietnam ranks in TOP 4 world largest footwear exporter in consecutive years, continuing to be benefited of recent FTAs



#### Automotive

- ❖ Being formed later than in other countries, Vietnam automotive is growing with many prospects



#### Food & Beverages

- ❖ F&B manufacturing grew at 7% during 2016-2020. Despite COVID plunge, F&B still has huge potential when the economy recovers



# 03 PEST - Economy

## Infrastructure development

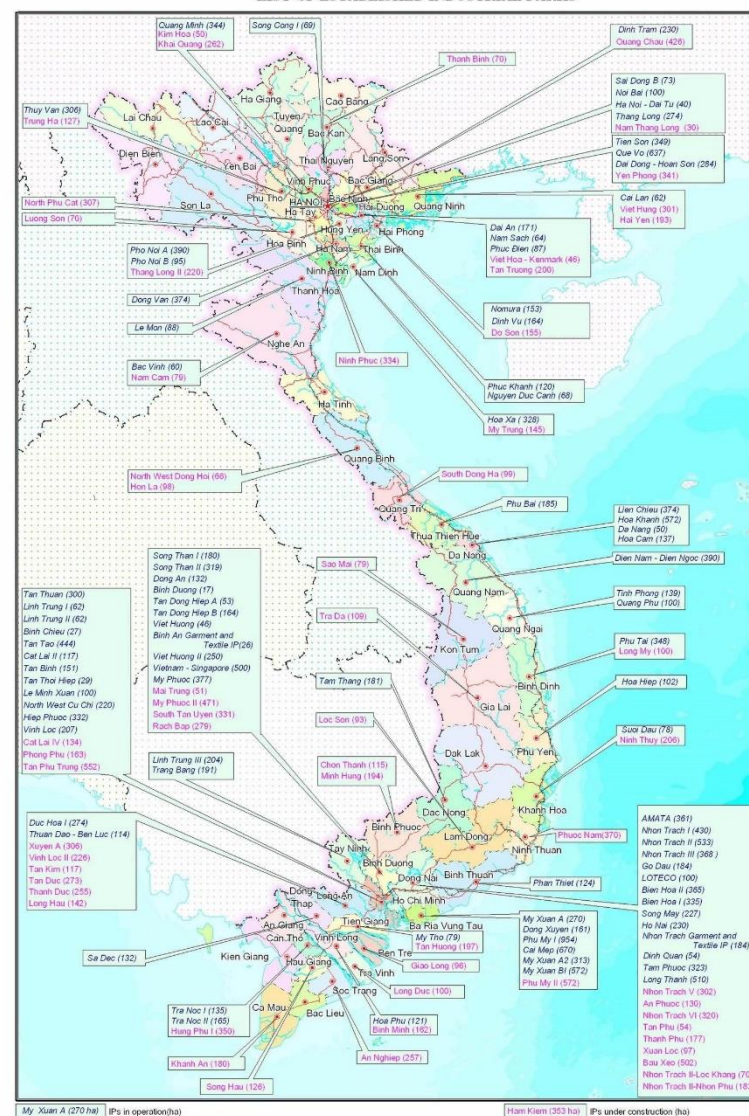
- With numerous active and planned industrial zones, Vietnam has a big capacity ready for deploying Smart Factory
- However, plants in IZs still mainly are manual production to exploit low labor cost. High-tech manufacturing is not present yet

### Quick view on Industrial Zones in Vietnam

As of 03/2021, there are:

- 575 planned industrial zones approved by Prime Minister
- 392 industrial zones have been established
- 286 industrial zones have officially come into operation
- Average occupancy rate is 57%. According to new draft Master Plan for National land use during 2021-2030, the expansion of IZs is allowed as long as occupancy is 60%
- Provinces with biggest Industrial Zones:
  - Binh Duong (10,000 ha)
  - Dong Nai (9,000 ha)
  - Ba Ria – Vung Tau (5,000 ha)
  - Bac Ninh (2,800 ha)
  - Hai Phong (2,200 ha)

LIST OF ESTABLISHED INDUSTRIAL PARKS



## 04 PEST - Society

### Vietnam workforce

- Vietnam's young workforce is potential to adopt new technologies. On the other hand, the quality of human resources utterly need to be improved in order to keep up with the requirements for Industry 4.0 and the deployment of Smart Factory

### Vietnam's labor workforce picture Q2/2021



- 16.6 million** are working in industry and construction sectors (increase 3.6% compared to same period of 2020)
- Trained workforce rate is much higher in urban areas (**41%**) than rural areas (**18%**)
- COVID has increased the number of unemployment (**1.2 mil**) and underemployment (**1.1 mil**)

#### Vietnam's workforce typical traits:

- Younger, balanced gender, increasing fast
- Not equally allocated by regions, industries
- Higher unemployment in urban; lower working time in rural
- Quickly adapt to computer / digital (e.g smart phone)
- However, lack of training, low professional skills, health, morale etc. lead to incompetence and low productivity

Source: Vietnam General Statistics Office (GSO), Ministry of Information and Communication (MOIC)

## 05 PEST - Technology

### Digitalization

- Overall, digital transformation in private sector in Vietnam has just at very basic level by preliminarily applying more IT (equipment, software) in operation. Large companies have higher capacity to mobilize for larger system transformation in their business, but also take more time to make changes and adjustments



# DIGITAL TRANSFORMATION

- **70% - 80%** of enterprises have not yet prepared proper HR for digital transformation
- Many are confused which technologies to choose
- **61%** are not ready for Industry 4.0, **21%** just begin to take some preparatory steps

#### BIGGEST ISSUES / BOTTLENECKS:

- Lack of explicit guidance / legal frameworks
- Lack of metadata / industry database
- Lack of access to new technologies
- Lack of resources: HR, capital, government support etc.

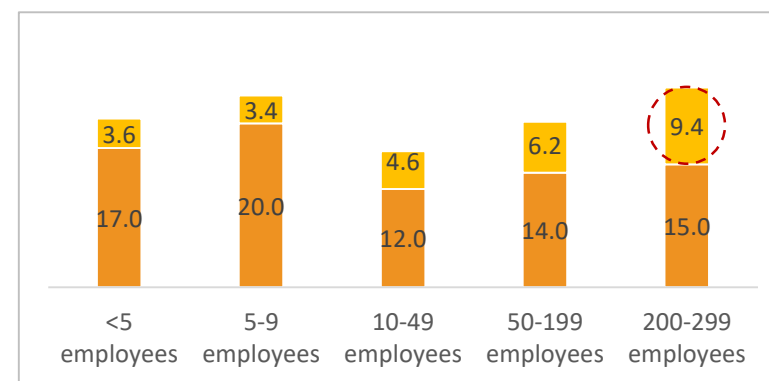
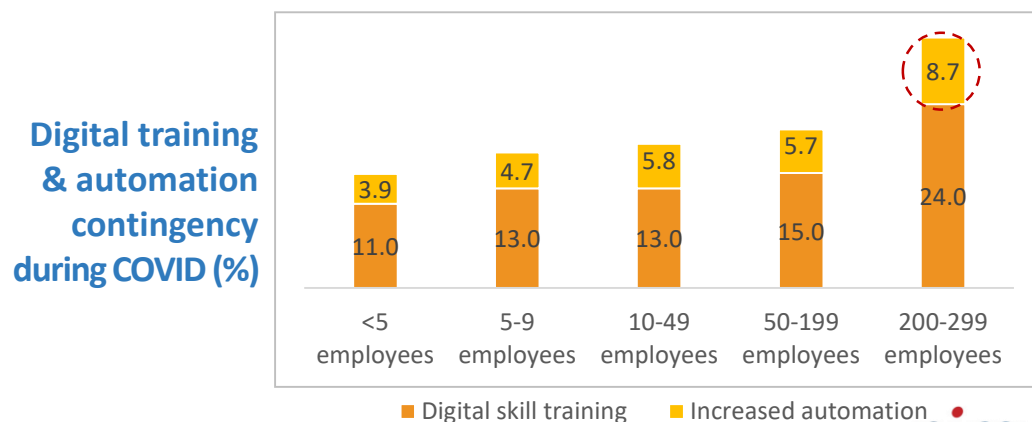
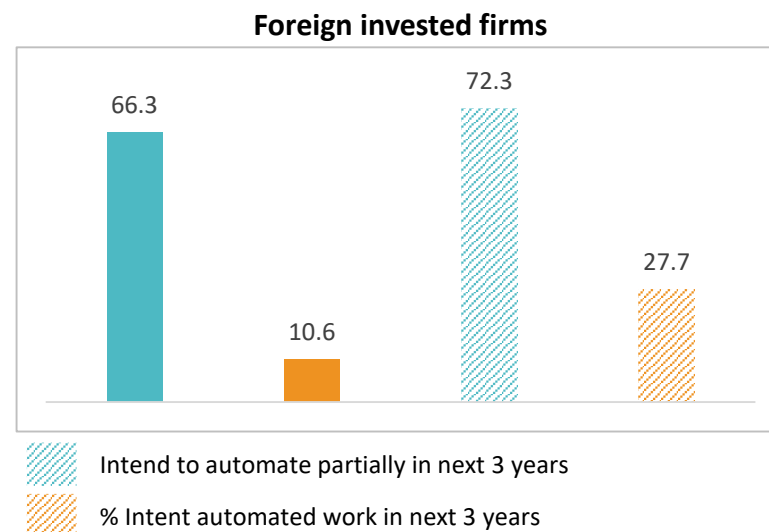
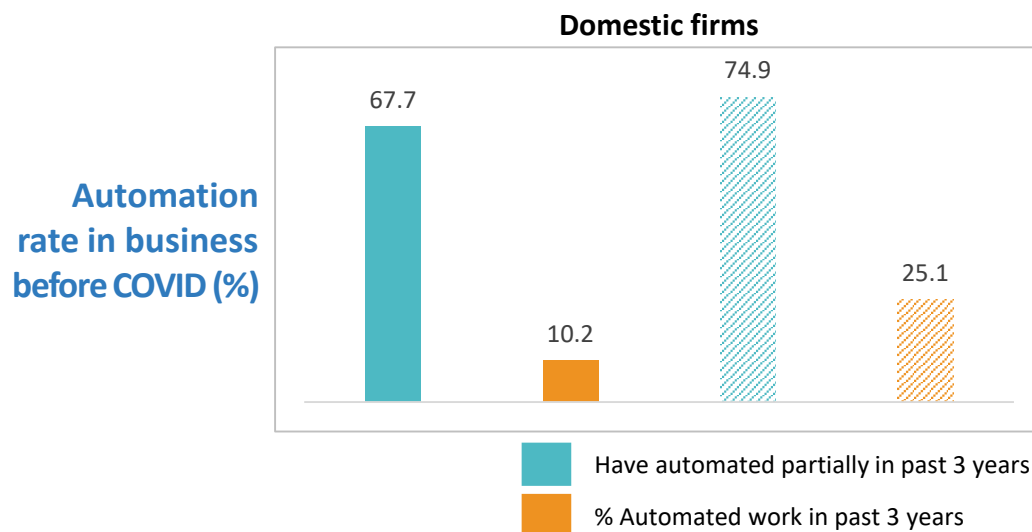
Source: Vietnam's Ministry of Industry and Trade (MOIT)

## 05 PEST - Technology

### Automation (1)

#### Changes during COVID-19

- Though ~70% of enterprises say to be partially automated, in fact, automation only involves in 10% of their work
- It can be seen that larger companies are more keen on automating their businesses



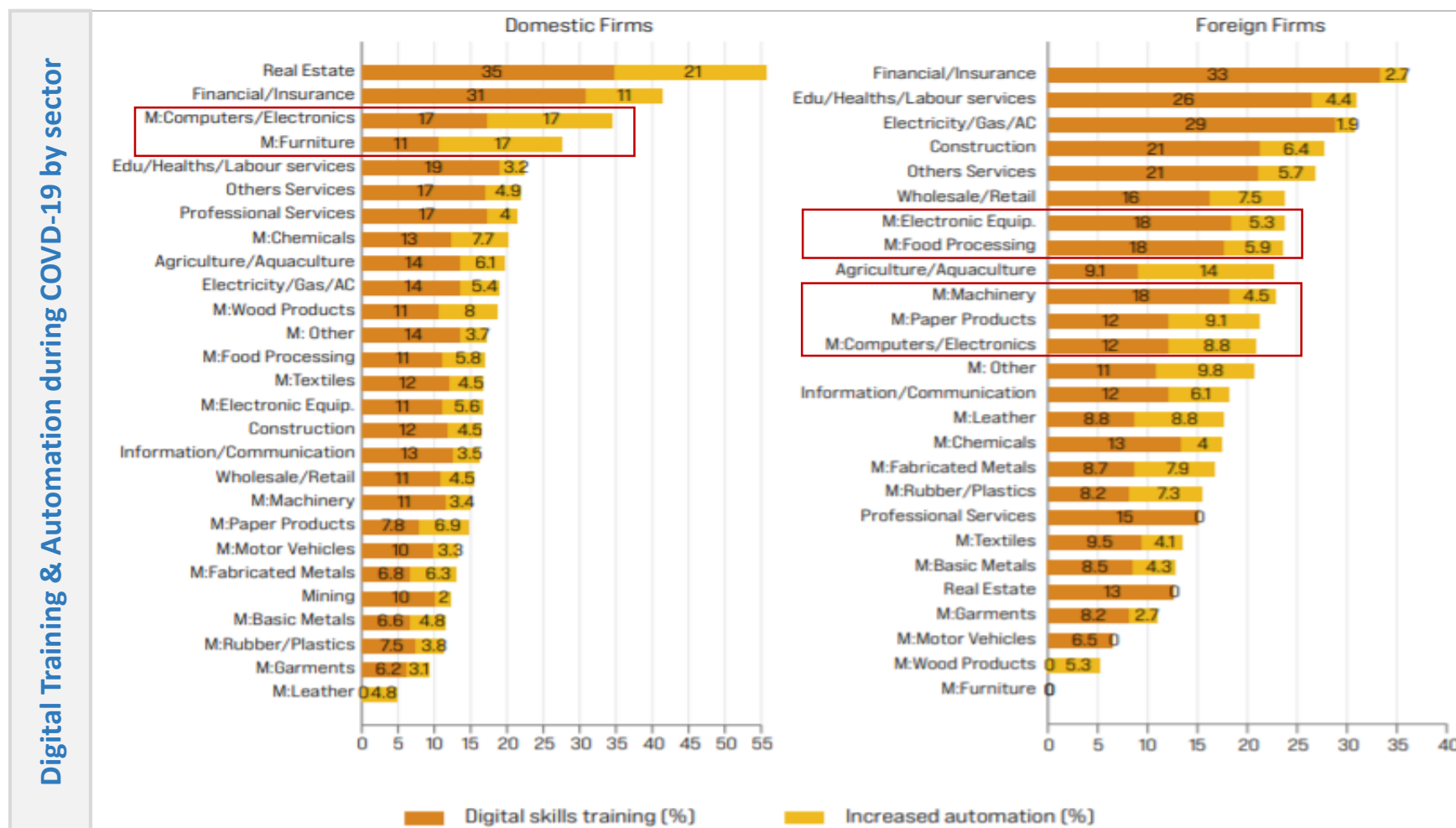
Source: Vietnam Chamber of Commerce and Industry (VCCI)

## 05 PEST - Technology

### Automation (2)

#### Automation in different manufacturing sectors

- Among manufacturing industries, Electronics / Computer / Furniture / Food processing / Machinery sectors prepare to switch to digital & automation during COVID-19 more than other products
- Leather / Garment / Textile / Motor vehicles show tiny signs of automating in near future





## 06 PEST analysis result

### Readiness level & forecast

- The 4 element assessment show that the readiness for Smart Factory in Vietnam is below medium. It is understandable because Vietnam has just started the Industry 4.0 and digital transformation a few years back
- Therefore, the deployment of Smart Factory in Vietnam is expected to no rush. Next step will be establish the foundation (policies, HR, capital attraction, digitalization)

	Politics	Economy	Society	Technology
<b>Readiness level</b>	Medium	Medium	Low	Low
<b>Advantages</b>	<ul style="list-style-type: none"> <li>Government addresses and starts to issue policies for digitalization and Smart Factory</li> </ul>	<ul style="list-style-type: none"> <li>Hot destination of huge stable flow of FDI</li> <li>Available venue (IZs) for building smart factories</li> </ul>	<ul style="list-style-type: none"> <li>Abundant young labor workforce, receptive and adaptive to new tech trends</li> </ul>	<ul style="list-style-type: none"> <li>Started to adapt new tech / benefited from close partner / investors</li> <li>COVID is big pusher for digital transformation</li> </ul>
<b>Disadvantages</b>	<ul style="list-style-type: none"> <li>Still lack of specific vision, instruction and financial support, incentivization, funding etc.</li> </ul>	<ul style="list-style-type: none"> <li>Unbalanced industrial structure, still rely much on manual, low tech products</li> </ul>	<ul style="list-style-type: none"> <li>Lack of trained, skillful qualification / morale, especially for IT and high tech operation</li> <li>Unbalanced allocation</li> </ul>	<ul style="list-style-type: none"> <li>Still low in adopting new advance tech</li> <li>Lack of direction, guide, HR, capital, will stagnant the progress</li> </ul>
<b>Future tendencies (1-3 years forecast)</b>	<ul style="list-style-type: none"> <li>Continue to complete the legal framework + enact favorable schemes to encourage Industry 4.0 adoption</li> </ul>	<ul style="list-style-type: none"> <li>Economy expected to recover after COVID</li> <li>Remain attractive to foreign investors and more hi-tech to come</li> </ul>	<ul style="list-style-type: none"> <li>Quality of workforce will improve gradually, but cannot meet high criteria in short time</li> </ul>	<ul style="list-style-type: none"> <li>Digital penetration will increase gradually in all sectors, but will take time to adopt 4.0 tech</li> </ul>

# CONTENTS

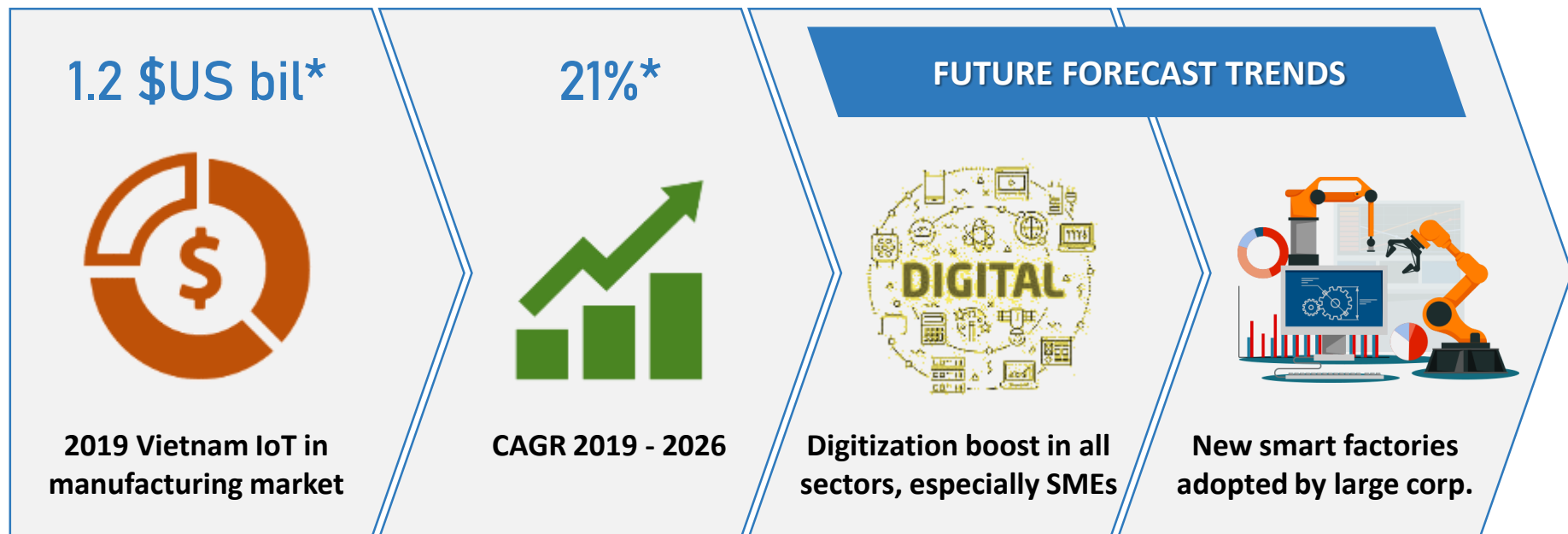
<b>Chapter</b>	<b>I</b>	<b>Research overview</b>
1.	Research overview	Page 3
<b>Chapter</b>	<b>II</b>	<b>Smart Factory overview – Global background</b>
1.	The world's history	Page 5
2.	What is Smart Factory?	Page 6
3.	Global movements	Page 8
<b>Chapter</b>	<b>III</b>	<b>Vietnam Smart Factory assessment</b>
1.	Analysis approach – PEST	Page 13
2.	PEST – Politics	Page 14
3.	PEST - Economy	Page 16
4.	PEST - Society	Page 20
5.	PEST - Technology	Page 21
6.	PEST result	Page 24
<b>Chapter</b>	<b>IV</b>	<b>Vietnam Smart Factory market trends</b>
1.	Market size & Forecast	Page 26
2.	Smart Factories in Vietnam	Page 27
3.	Korean participation	Page 35
<b>Chapter</b>	<b>V</b>	<b>Research summary</b>
1.	Summary	Page 39

## 01 Market size & Forecast Vietnam future growth

- Up to now, there is not yet a clear estimation for total Vietnam Smart Factory market size, since it is still at very beginning. It can be imagined to be young and immature but with substantial potential for growth
- As it stands now, in next 1-3 years, Smart Factory in Vietnam will continue a gradual step-by-step penetration, with 2 parallel movements:

1/ The initial digitalization in HR / IT software in SMEs

2/ Large companies may take bold actions to build smart factory with new high-tech robots, automation but at first only few spearheads with substantial resources



\*Source: TechSci Research estimation

## 02 Smart Factories in VN

### Domestic players (1)

#### A quick recap on domestic Smart Factories in Vietnam

- Vinamilk can be seen as the first pioneer in Vietnam to deploy Smart manufacturing for dairy production (quite early since 2013)
- Next, 2 domestic giant car manufacturers – Thaco and Vinfast also follow the step to start their smart factories in 2018
- Recently, though 4.0 Technologies (IoT, Big Data, AI etc.) have been studied and applied more in many industries, really starting to build a smart factory is still limited among a few names
- Hypothetically, there might be other players who are working either partially or fully on smart factory deployment, but still at an early stage without public announcement
- Next typical examples of Smart Factories in Vietnam are in industrial production, which are the automated Fiber Optic line of VNPT Postef and Plastic plant within Sunhouse complex
- Recently in 2021, another player that announces their participation in Smart Factory is Phenikaa, a multi-industrial corporation with the start of Phenikaa Smart Electronics plant construction (first phase investment is approximately 1,000 bil VND – equal to 45 mil USD)



## 02 Smart Factories in VN

### Domestic players (2)



#### **Vinamilk Mega Factory (2013):**

- Industry: Dairy production
- Location: My Phuoc Industrial park, Binh Duong province
- Using LGV robots and Smart Warehouse system built by Schafer (Germany), with the capacity of producing 800 million liter per year
- Vinamilk Mega Factory qualifies a number of international standards such as FSSC 22000, GMP, ISO 9001:2015, PASS 99 (ISO 14001 + OHSAS 18001), ISO 50001, ISO 17025, HALAL.
- In 2019, Vinamilk invested more 10 mil USD to scale up the factory as the biggest dairy plant in South East Asia



#### **Thaco Mazda factory (2018):**

- Industry: Automotive
- Location: Chu Lai Industrial zone, Quang Nam province
- Received great technological transfer from Mazda Japan
- 5-stage manufacturing process using different types of robots in each stage, such as 80% automated assembly line, welding line with 70 newest generation robots of Kawasaki, quality control process in accordance with MES (Mazda Engineering Standard, ISO/IATF 16949, ISO 14001 etc.)



## 02 Smart Factories in VN

### Domestic players (3)



#### Vinfast Automotive Plant (2018):

- Industry: Automotive
- Location: Dinh Vu Industrial zone, Cat Hai, Hai Phong
- Cooperate with Siemens to deploy smart operating system. Until 2021, Vinfast and Siemens have successfully aligned automation into the production, shortening the cycle of the assembly line
- Some core 4.0 technologies that Vinfast exploits on Siemens' premise such as PLM (Product Lifecycle Management), MOM (Manufacturing Operation Management), TIA (Totally Integrated Automation), Siemens Op center



#### VNPT Postef Smart Fiber Optic Factory (2019):

- Industry: Fiber Optic manufacturing
- Location: VSIP Bac Ninh
- Apply smart manufacturing model & automation e.g main production line supplied by NEXTTROM (Finland)
- Out of total nearly 300 billion VND budget, POSTEF received 7 billion VND fund from Ministry of Science and Technology for R&D under qualifier of Decision No 66/QD-Ttg to develop research activities for fiber optic production and procedure to test and ensure quality

Source: Desk search and synthesis

## 02 Smart Factories in VN

### Domestic players (4)



#### Sunhouse Aluba Plastic plant (2021):

- Industry: Plastic manufacturing
- Located in a complex of 8 Sunhouse factories in Ngoc Liep IZ, Quoc Oai, Ha Noi
- Since 2021, cooperate with ITG to deploy 3S iFACTORY following ISA-95 standards by the World Automation Association, combining the production line from Korea that allows real-time tracking, synced data for MES, ERP, MPS, MRP etc.
- Aluba Plastic plant's main focus is to build a real-time data stream interconnected across the whole factory, allowing simultaneous supervision, management and operation, supporting to upgrade the quality control process



#### Phenikaa Smart Electronics plant (2021):

- Industry: Led and lighting equipment production
- Location: Hoa Lac high tech industrial park, Thach That, Ha Noi
- Started construction – Total investment for the first phase is nearly 1,000 billion VND (equal to 45 million USD)
- Target on a full circle from research – application – manufacturing – commercial, Phenikaa Smart Electronics plant aims to provide Smart Lighting, Smart Home, smart robots etc. for civil use

Source: Desk search and synthesis

## 02 Smart Factories in VN

### Foreign players (1)

How international stakeholders are involved in Vietnam Smart Factory development?

- Foreign companies are also targeting Vietnam as a potential destination and taking proactive steps in building Smart Factory market in Vietnam
- However, most of initial activities are under funding, partnership, technology transfer etc. while actual Smart Factory establishment and operation is not too aggressive
- Some possible reasons for the prudence:
  - They have to wait for completion of macro environment (politics, legal framework, infrastructure construction etc.)
  - Some manufacturing sectors are still benefited of low labor cost e.g textile, apparel, footwear etc., so automation is not yet an urgent task
- Besides some active international suppliers that provide Smart Factory solutions to Vietnamese companies such as Siemens, ABB and so on, a few have actually built Smart Factory include Henkel (Germany) and General Electric (US)



## 02 Smart Factories in VN

### Foreign players (2)



#### Henkel Adhesives Smart Factory (2017):

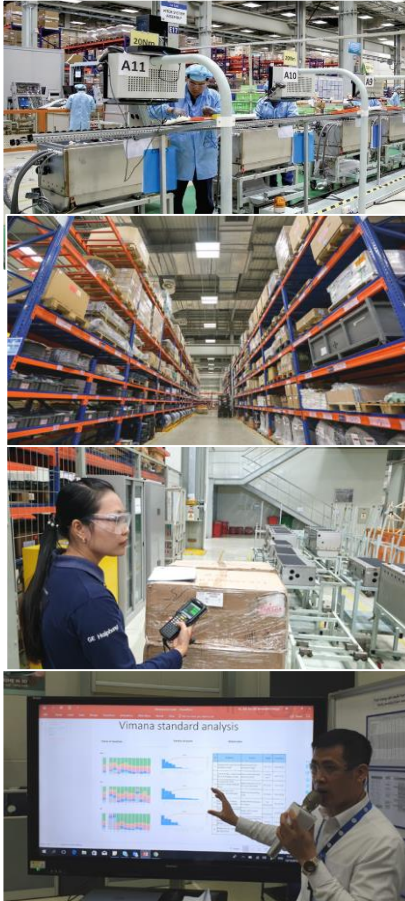
- Industry: Adhesives manufacturing
- Origin: Germany
- Located in Bien Hoa 2 Industrial Park, Dong Nai province
- Fully automated from materials to manufacturing, packaging, sales, delivery to customer support, by combining Manufacturing Execution System (MES) and Enterprise Resource Planning (ERP)
- Henkel also provides other manufacturers with smart solutions tailored in order to help them optimize their processes
- Since 2019, Henkel opened an Application Center in Bien Hoa, Dong Nai, as a showroom enabling their customers to eye witness automated adhesives solutions and processes, such as robot arms spraying fine layers of adhesive onto soles
- In the Application Center, its partners can simulate their own applications and render tests on new technologies

Source: Desk search and synthesis



## 02 Smart Factories in VN

### Foreign players (3)



#### General Electric Factory (2018):

- Industry: Renewable energy, Power generator, wind turbines, other mechanical products
- Origin: US
- Located in Nomura Industrial zone, Hai Phong
- Established from 2010, since 2016-2019 started adopting digitalization
- GE Smart Factory in Hai Phong, Vietnam is one of 7 GE Smart factories across the world, with the total investment of 111 million USD
- Exploit 4.0 exclusive technologies from GE Corp e.g robots, auto carts, Predix, IoT, Vitama... The entire production is digitalized and automated, based on 4 key elements: Lean manufacturing, Digital maturity, Advanced manufacturing, Additive manufacturing. The warehouse is tracked real-time by bar code synchronized on cloud database
- Beside deploying their own smart factories, General Electric also puts a lot of effort into research development to contribute to the transformation of the total Industry 4.0. In 2018, they announced to invest 1.2 billion USD to establish an IoT solution company to serve for industrial enterprise clients

Source: Desk search and synthesis

## 02 Smart Factories in VN

### Foreign players (4)



#### Coca Cola (2013 – present):

- Industry: Beverages
- Origin: US
- Location: 3 large manufacturing factories in HCMC, Ha Noi and Da Nang, planning to construct the 4<sup>th</sup> plant in HCMC by 2020
- Since 2013, Coca Cola has been upgrading their production line toward Smart manufacturing model, sustainable growth. During 2013-2016, Coca Cola launched the expansion plan worth 300 million USD to up-level advanced technologies and equipment for their plants
- Coca Cola has started to use green renewable energy and integrated sensors in their factories to synchronize data, control quality and form a closed repetitive production process, fully automated and operated by robots
- Upgrade smart warehouse with automatic stock import / export and global tracking system: E.g Coca Cola invested 5 million USD to enhance Da Nang factory with new smart warehouse and drain treatment system
- Also pioneer in applying Block chain technology to communicate with partners and suppliers, which helps save huge time for a manufacturing cycle, increase productivity as well as efficiency

Source: Desk search and synthesis



## 03 Korean participation

### Active involvement

Vietnam is a favored destination to many Korean enterprises

- Korea is a close partner of Vietnam. Many big Korean corporations have opened plants across many industrial zones, namely Samsung, LG, Hyundai (in collaboration with Thaco), Daewoo etc.
- Korean companies have taken early leaps toward the Industry 4.0 and set a model example for many Vietnamese counterparts. Among those, Samsung is one of the most proactive to develop Smart Factory solutions and transfer to Vietnamese enterprises. Some remarkable milestones include the partnership with CMC or the coordination with local government to help businesses upgrade high-tech
- Other Korean sectors also show interest, e.g the agreement of 900 mil USD investment in An Giang province (2019)



## 03 Korean participation

### Technology distribution

#### KOREAN PROACTIVE PARTICIPATION IN VIETNAM SMART FACTORY DEPLOYMENT

##### 2018 – CMC cooperates to deploy Samsung SDS's MES to Vietnamese firms

- Samsung SDS, a member of Samsung Corporation, specializes in providing IT solutions and logistics to Samsung Corp and their clients, partners globally
- Samsung targets Vietnam as a potential destination for developing Smart City, Smart Building
- In 06/2018, Samsung SDS signed a strategic agreement and entered a close partnership with CMC
- Initially, CMC would take over the MES (Manufacturing Execution System) solution implementation & management for 200 Samsung SDS clients in VN and with plan to expand to South East Asia
- Samsung SDS is also interested in collaborating in telecom and system integration and in developing Smart City, Smart Building, IoT, Cloud computing, AI applications in Vietnam market
- In 2019, Samsung SDS proposed to invest in the SETV Ha Noi (Data center) project in Yen Binh Industrial project, with the estimated investment of 300 billion VND (about 14 million USD)



Source: Desk search and synthesis

## 03 Korean participation

### Investment & Cooperation

#### KOREAN PROACTIVE PARTICIPATION IN VIETNAM SMART FACTORY DEPLOYMENT

##### 2019 – Smat Korea invests 900 mil USD in smart Industrial Zone in An Giang province

- 26/11/2019 SMAT Korea and An Giang's People Committee had a meeting about investing in a smart industrial zone in the local area
- Will focus on key industries such as textile, light metallurgy etc. to utilize the local human resource and will call for other Korean investors
- Mr. Oh Se-young from SMAT Korea commits with profound experience, Korea will be a reliable long term partner for An Giang province in developing the economy toward Industry 4.0



##### 2021 – Samsung Vietnam helps local firms to pursue Industry 4.0 & join global supply chain

- Cooperated with MOIT to deliver training for national consultants, build real-time tracking system and apply Samsung Key Process Index (KPI) system in businesses
- In 3 years (2018-2020), Samsung coordinated with MOIT has been training 327 Vietnamese experts and consulting for 260 enterprises on how to improve production competitiveness
- In 2020-2023, Samsung plans to deploy the training program for 200 experts



Source: Desk search and synthesis

# CONTENTS

<b>Chapter</b>	<b>I</b>	<b>Research overview</b>
1.	Research overview	Page 3
<b>Chapter</b>	<b>II</b>	<b>Smart Factory overview – Global background</b>
1.	The world's history	Page 5
2.	What is Smart Factory?	Page 6
3.	Global movements	Page 8
<b>Chapter</b>	<b>III</b>	<b>Vietnam Smart Factory assessment</b>
1.	Analysis approach – PEST	Page 13
2.	PEST – Politics	Page 14
3.	PEST - Economy	Page 16
4.	PEST - Society	Page 20
5.	PEST - Technology	Page 21
6.	PEST result	Page 24
<b>Chapter</b>	<b>IV</b>	<b>Vietnam Smart Factory market trends</b>
1.	Market size & Forecast	Page 26
2.	Smart Factories in Vietnam	Page 27
3.	Korean participation	Page 35
<b>Chapter</b>	<b>V</b>	<b>Research summary</b>
1.	Summary	Page 39

## 01 Executive summary

### Key take-aways

#### GLOBAL MOVEMENTS

- Smart Factory is a key element in the Industry 4.0, which has just begun in the last decade over the world
- At present, a number of countries have pioneered in building and deploying Smart manufacturing / Smart factory. However, this is still the early stage yet without a “ultimate success” or “full automation”
- Smart Factory has been implemented first in some sectors such as Automotive, Electronics, Chemicals, F&B and by large corporations with huge capital and resources
- Although developed countries take the lead in experimenting Smart Factory, emerging regions are selected to actually build up plants, still to exploit lower costs of their locals

#### VIETNAM SITUATION

- Vietnam has followed the world to welcome the Industry 4.0 but behind a few years, hence the status of digital transformation and Smart Factory is still very fresh new
- As the result, the application of 4.0 technologies is primitive in all sectors from public to private. Nonetheless, the necessity has been addressed and it is witnessing a slow shifting towards global movements
- Vietnam still lacks a plenty of premium components to quickly develop Industry 4.0, from government policies, regulations, capital, qualified HR to capital. In fact, large industrial leaders (such as Vinamilk, Vinfast, THACO, Sunhouse etc.) are among few pioneers with innovative mind and sufficient capacity to take a first step with Smart Factory. Meanwhile, other businesses are lagged behind, either because of unclear direction, slow reaction or shortage of money
- On the other hand, with positive driving forces such as foreign investment’s stable growth, the attention and support of partners / investors etc. in near future, Vietnam’s economy will refocus and may see steady progress in Industry 4.0 and Smart Factory
- Among interested nations, Korea and their stakeholders are very active in deploying & supporting Smart Factory establishment in Vietnam



# THANK YOU!



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