

Digital Transformation: Opportunities and Challenges for Taiwan

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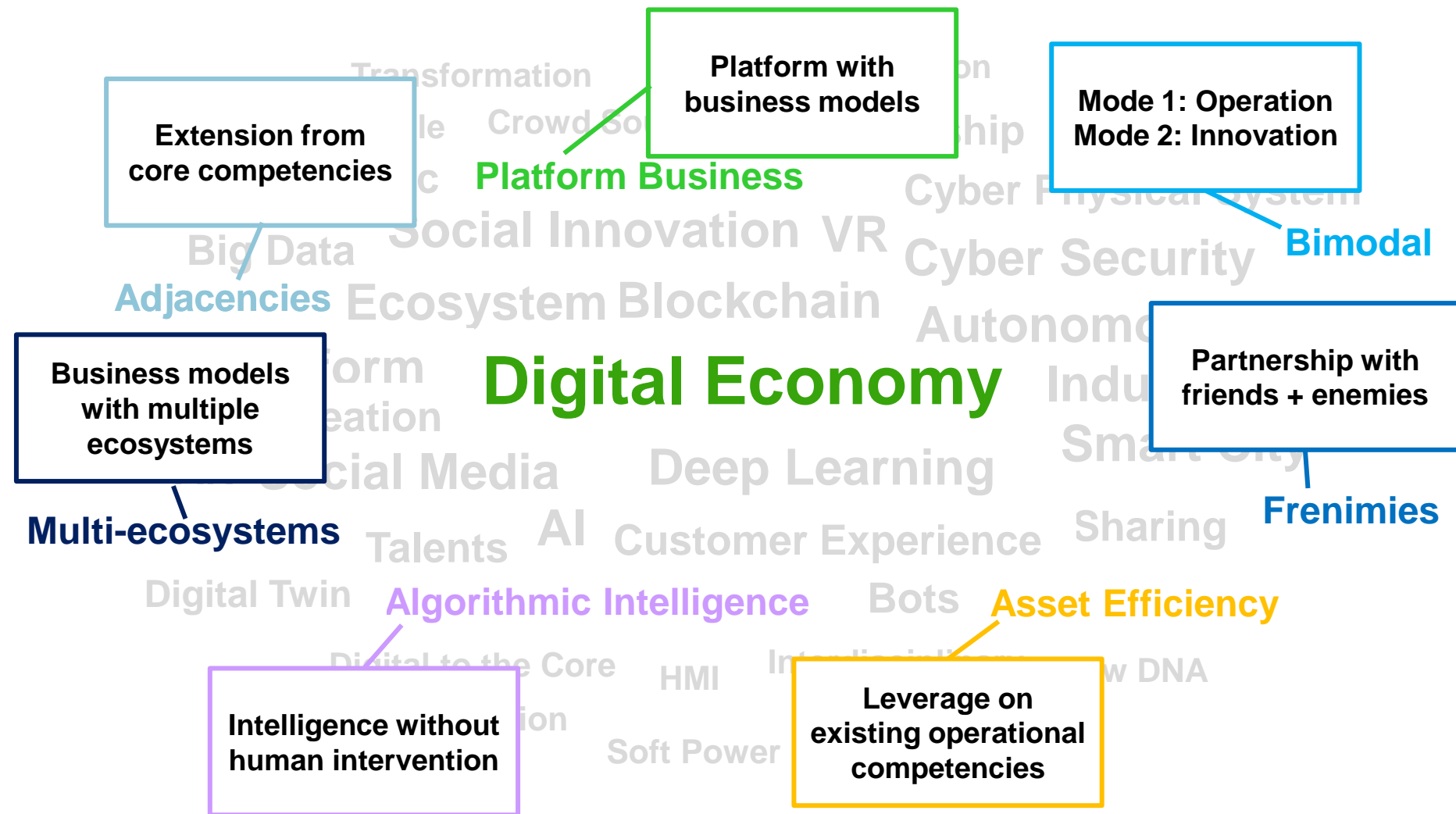


Outline

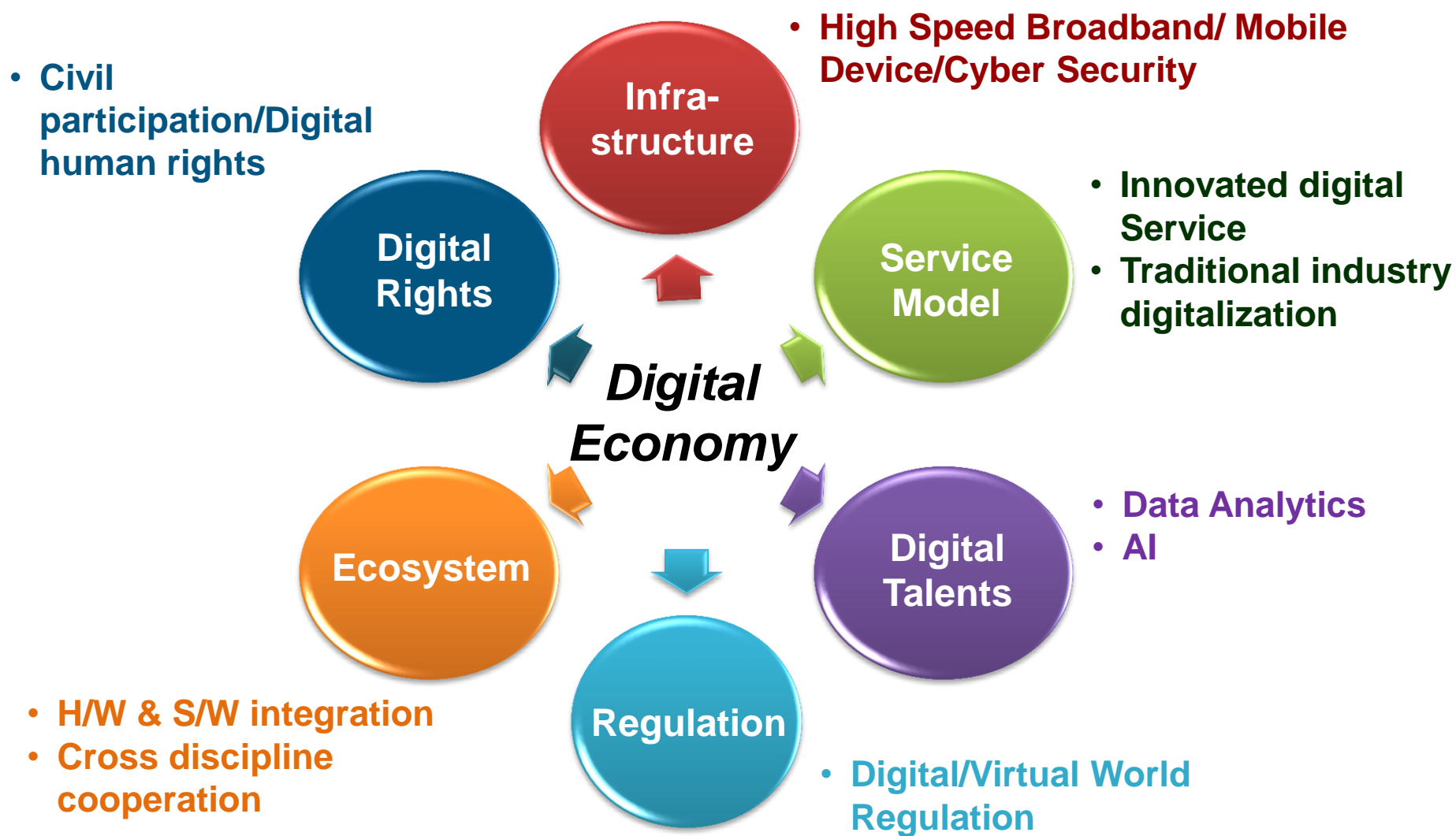
- **Future Trends of Industry Development**
- Opportunities and Challenges for Taiwan
- Directions for Taiwan Policy/Strategy
- Conclusion

New Trends in Digital Economy

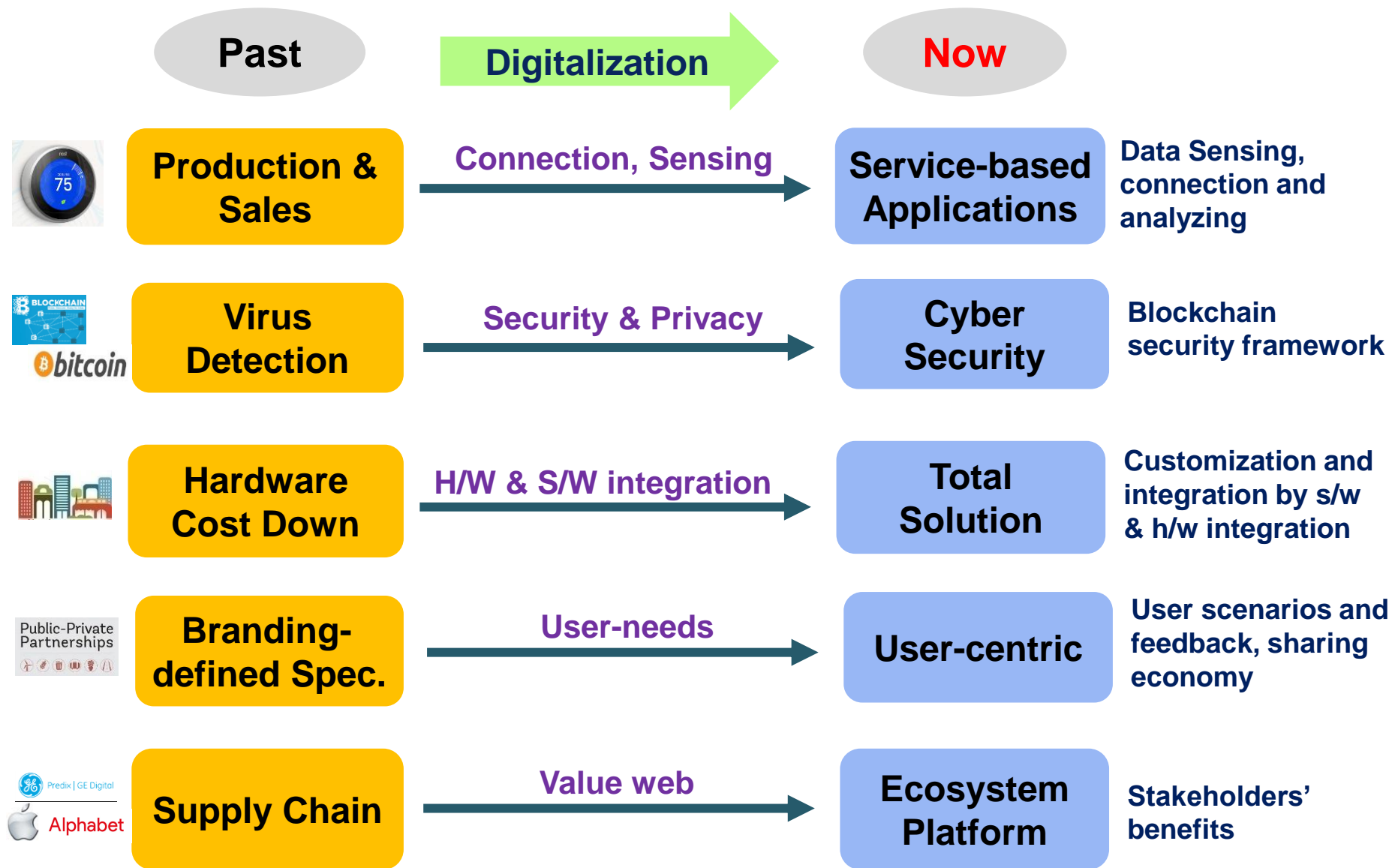
New Emerging Trends



Six Pillars of Digital Economy

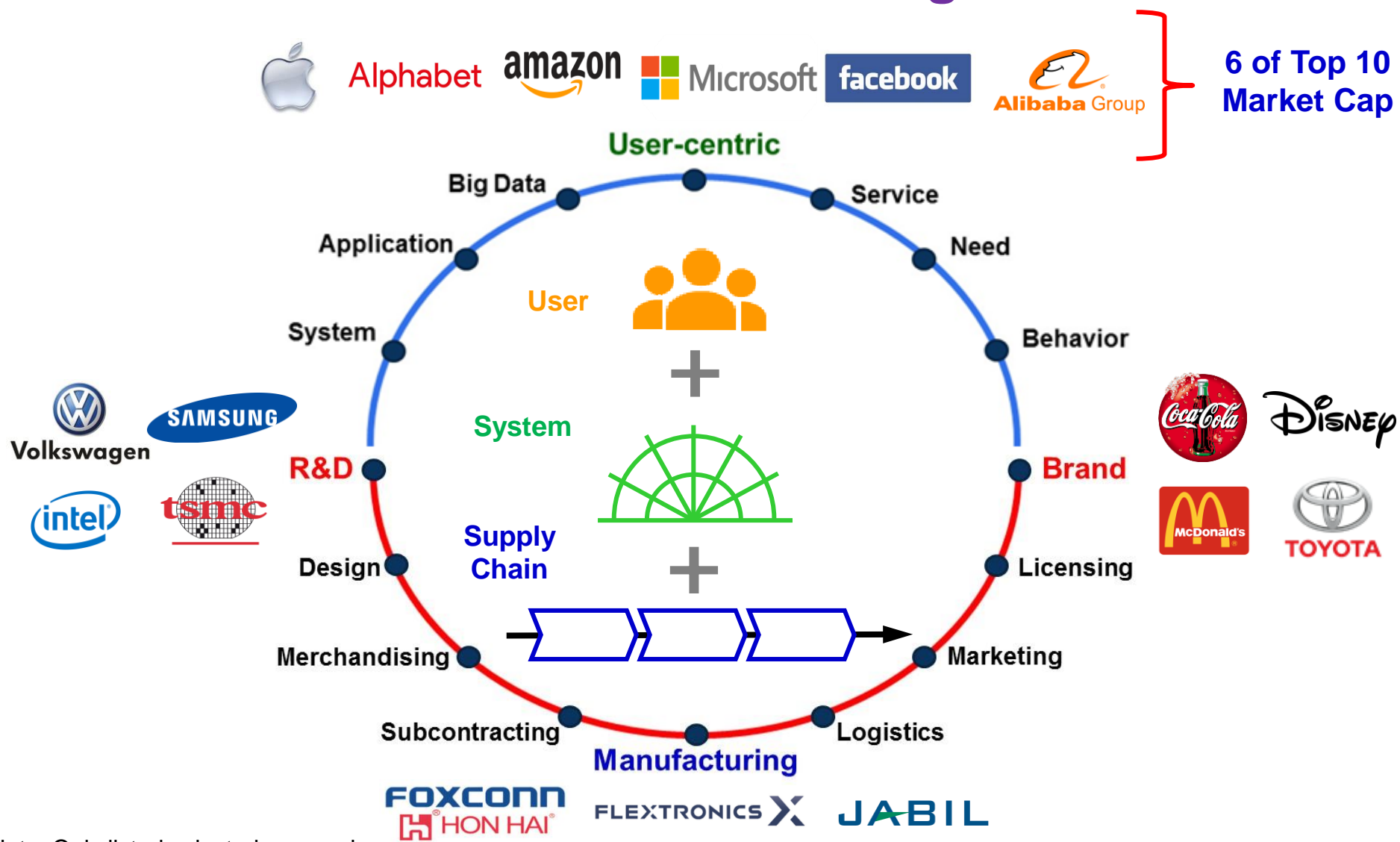


New Paradigm Shifts under Digital Economy



Control Apex of User-centric Ecosystems

More than Branding

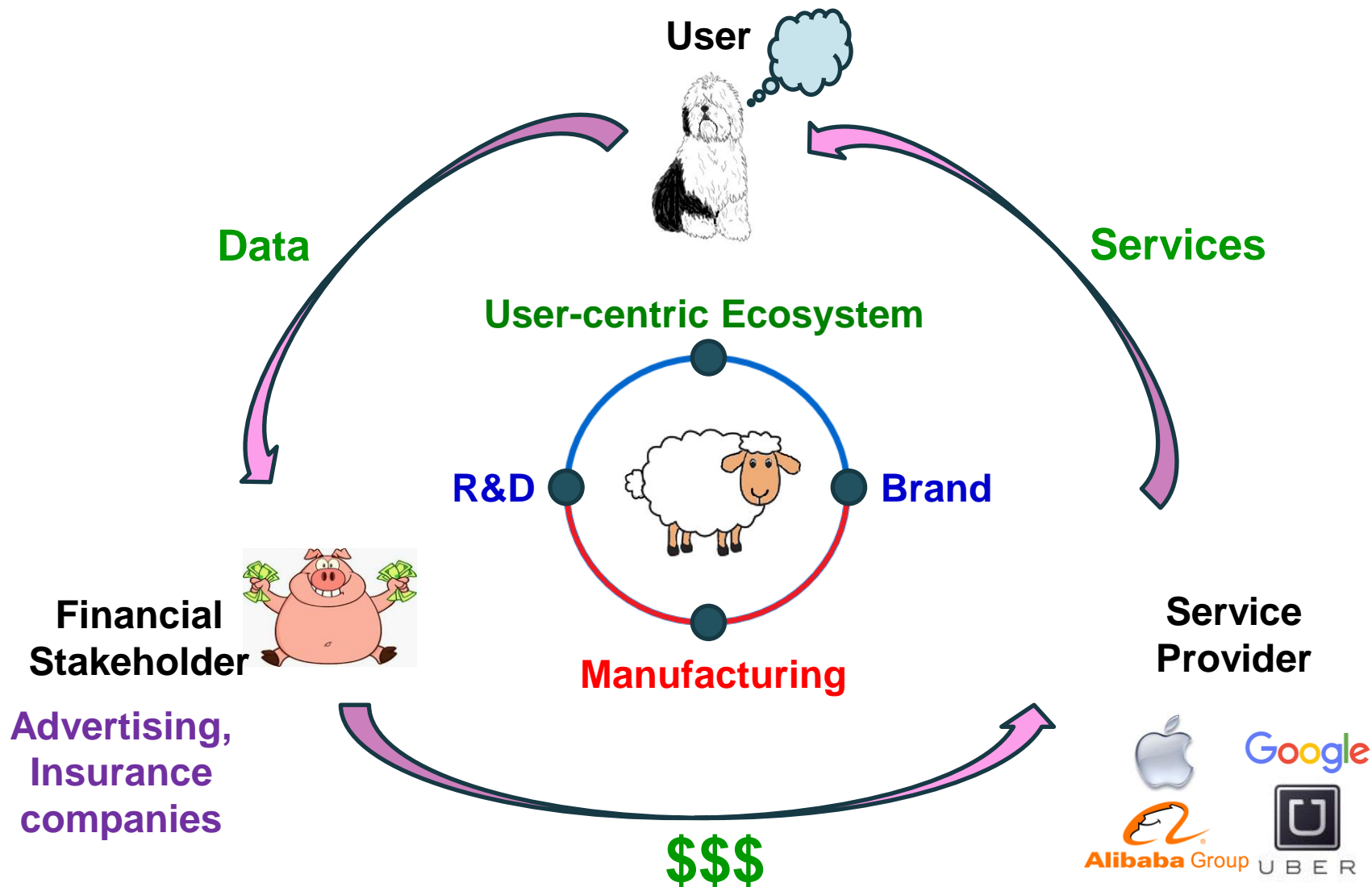


Note: Only listed selected companies

Source: ITRI/IEK(2017/08)

New Biz Model in User-centric Ecosystems

Wool out in dogs, pigs to pay (羊毛出在狗身上，豬來買單)

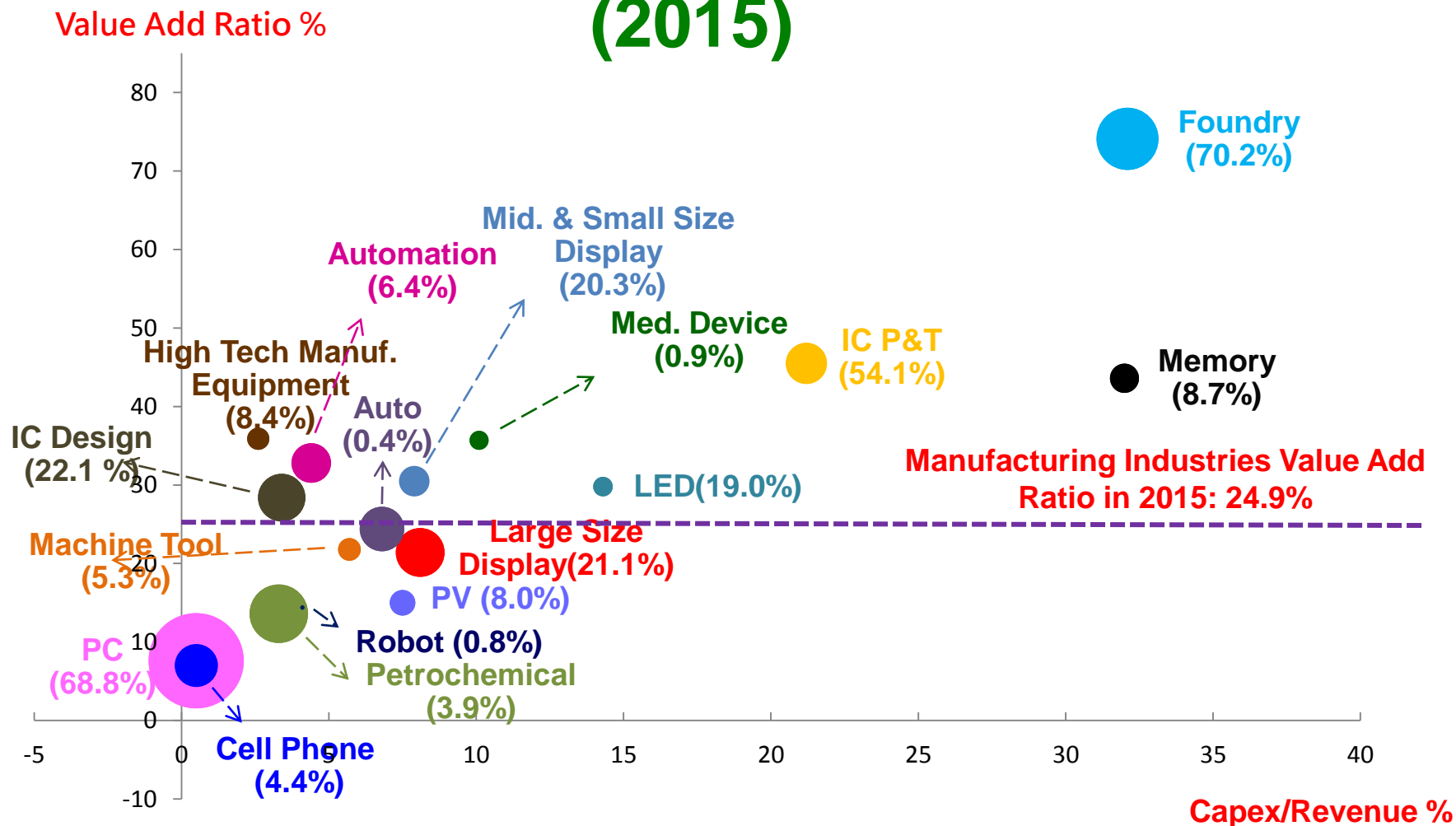


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Taiwan Manufacturing Industry Portfolio (1/2)

(2015)



→ Size of the bubble equals revenue and US\$40b.

Note 1: x-axe (Capex/Revenue Ratio %) and y-axe (Value Add Ratio %) @2015

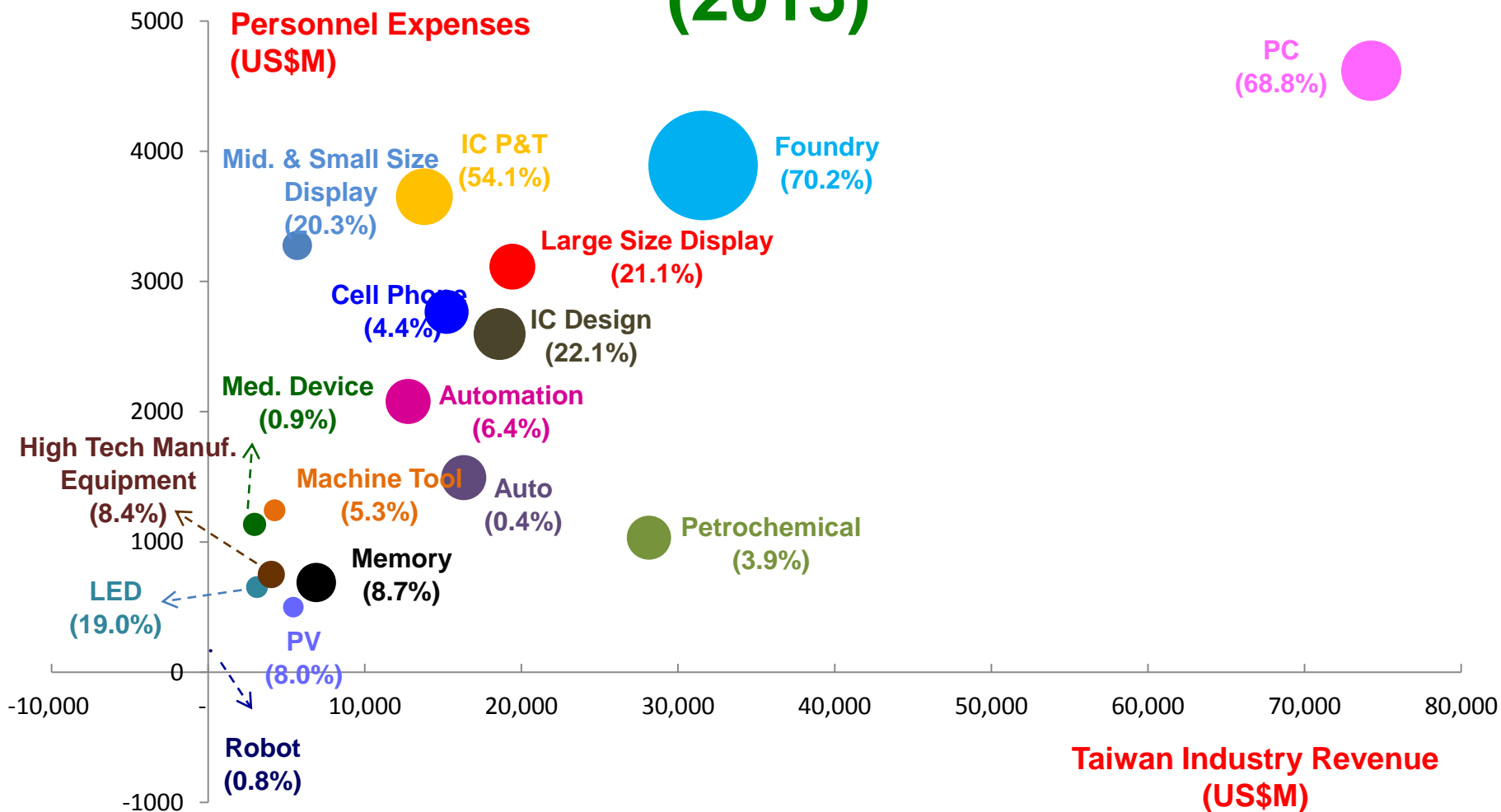
Note 2 : () 2015 Taiwan industry market share worldwide

Note 3 : Manufacturing Industries Value Add Ratio in 2015 calculated based on GDP/gross sum of manufacturing value



Taiwan Manufacturing Industry Portfolio (2/2)

(2015)

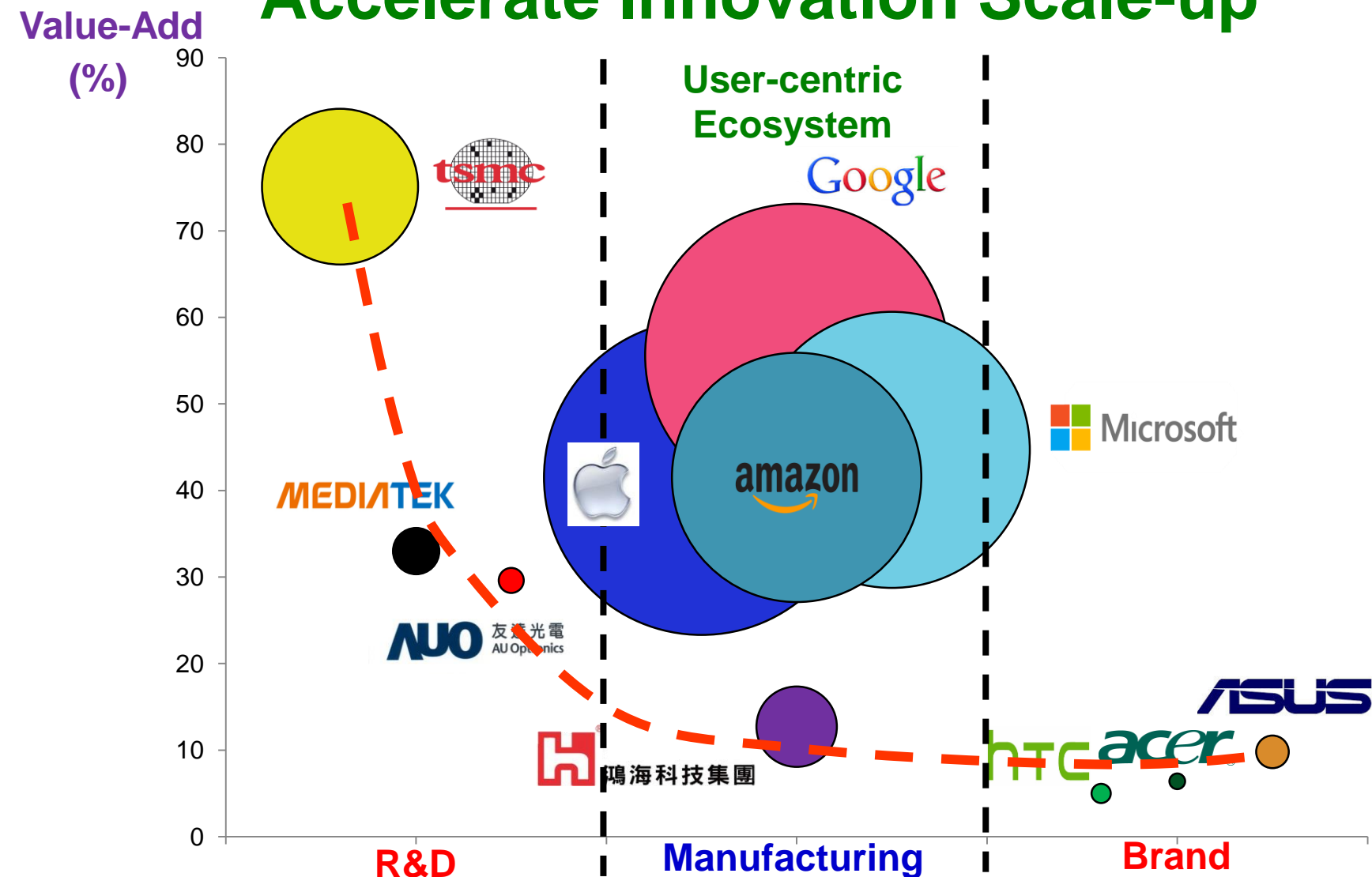


Note 1: x-axle (Taiwan Industry Revenue US\$M) and y-axle (Value Add Ratio %) @2015

Note 2 : () 2015 Taiwan industry market share worldwide

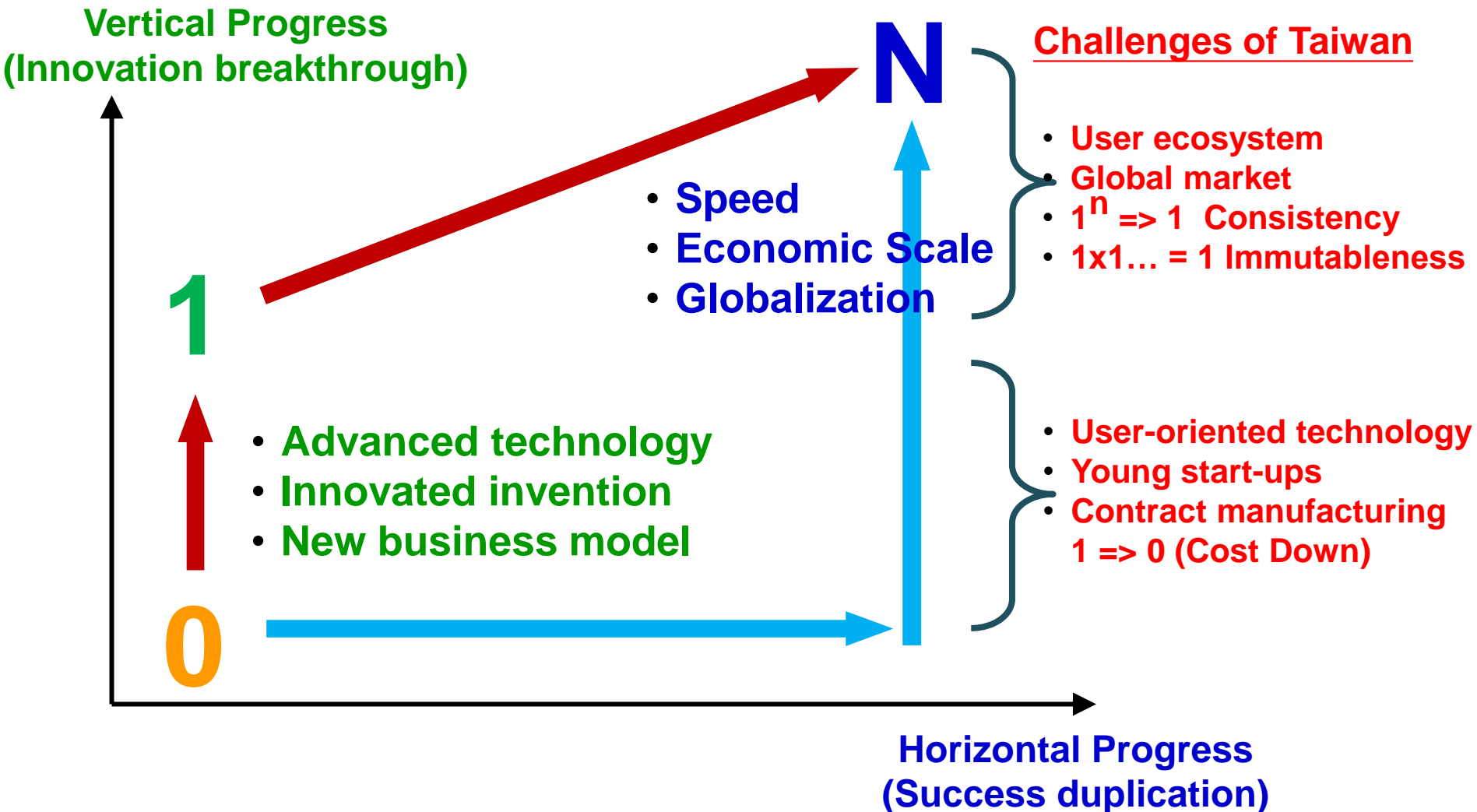
Note 3 : Manufacturing Industries Value Add Ratio in 2015 calculated based on GDP/gross sum of manufacturing value

Controlling User-centric Ecosystem to Accelerate Innovation Scale-up

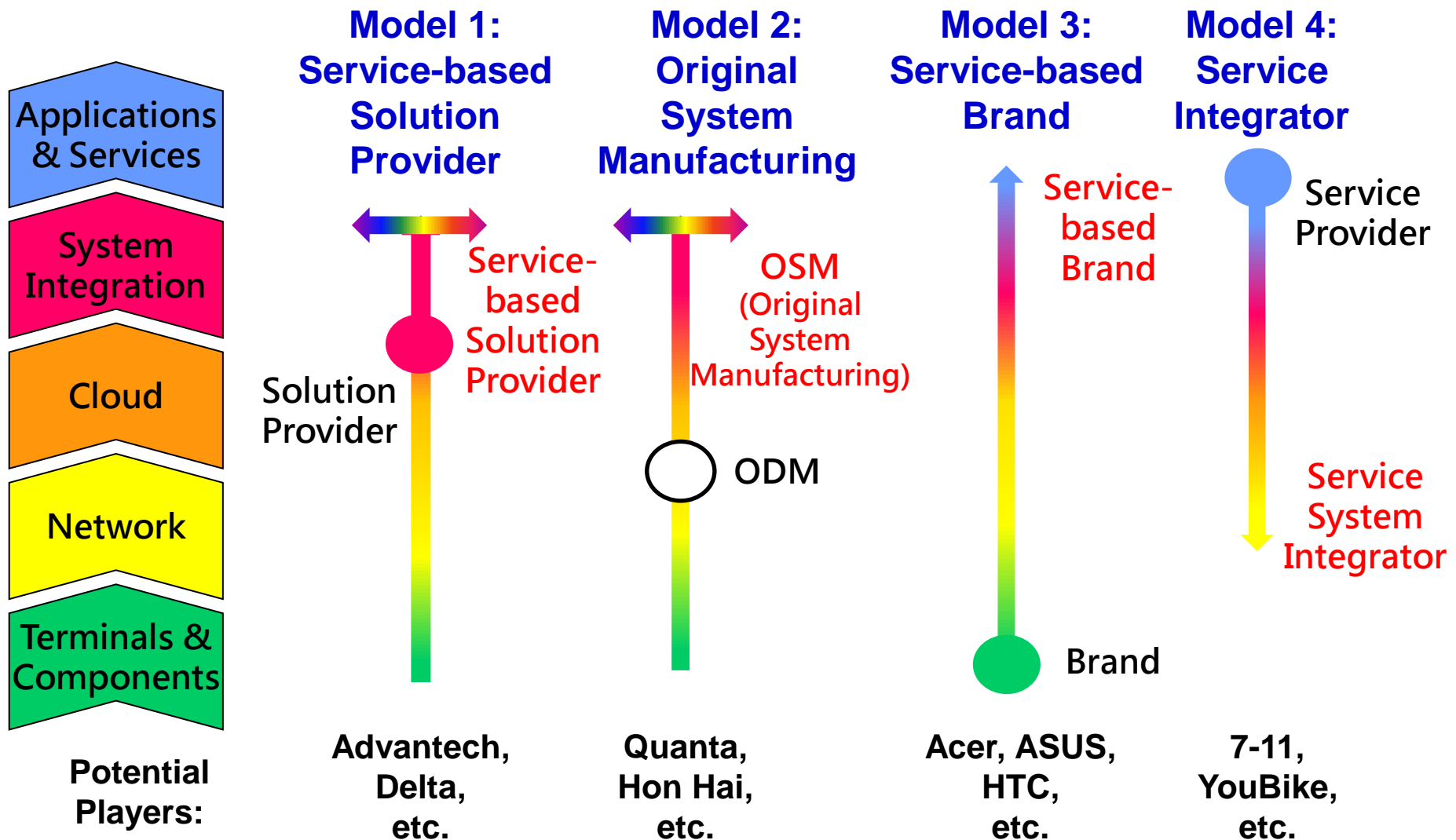


Note: Bubble size is market cap. Except for market cap which is as of 2016/09/06, all other financial indicators are 2015 data

Challenges for Taiwan: From 0 to 1, and 1 to N



From “Manufacturing” to “Infofacturing”



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Taiwan Industry Innovation for Next Stage

Linkage
with the
Future

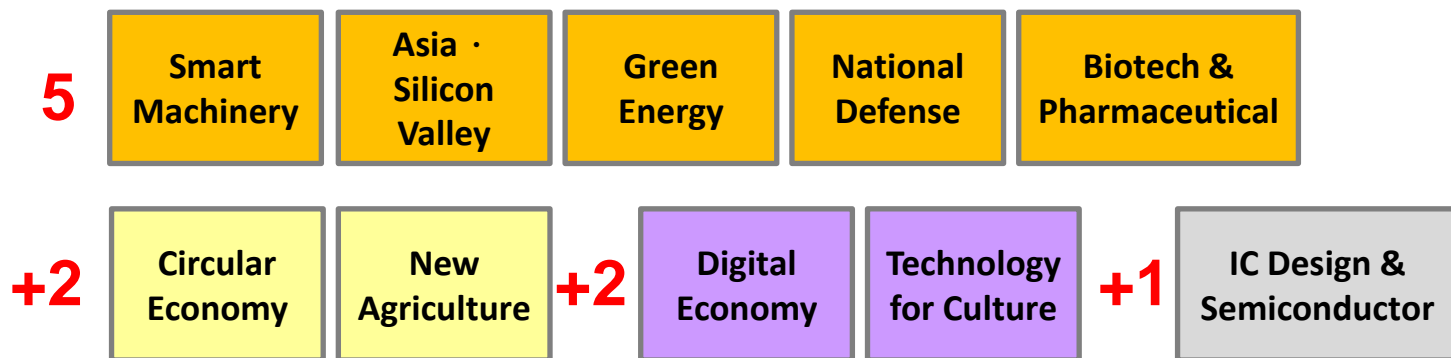
Linkage
with the
Global
Resources

Linkage
with Local
Communi-
ties

Strengthen the Industrial Competitiveness through Innovation

- Leverage existing strengths in innovation and R&D to develop cutting-edge new product applications and services with global potential
- Utilize innovative design to market Taiwan
- Promote cross-industry technology integration, with an emphasis on digitalization, Internet-enablement, smart technology and environmentally-friendly technology

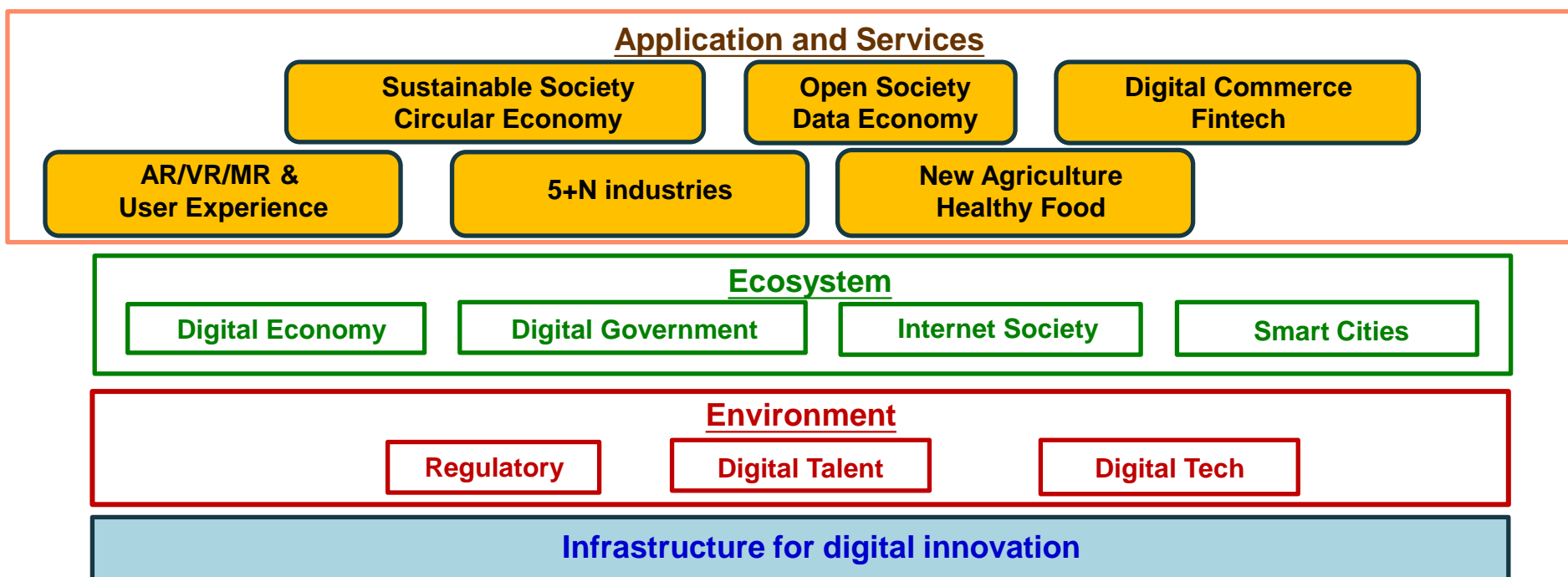
Focus on Industry Innovation Initiatives



Digital Nation Strategy: DIGI+ (2017-2025)

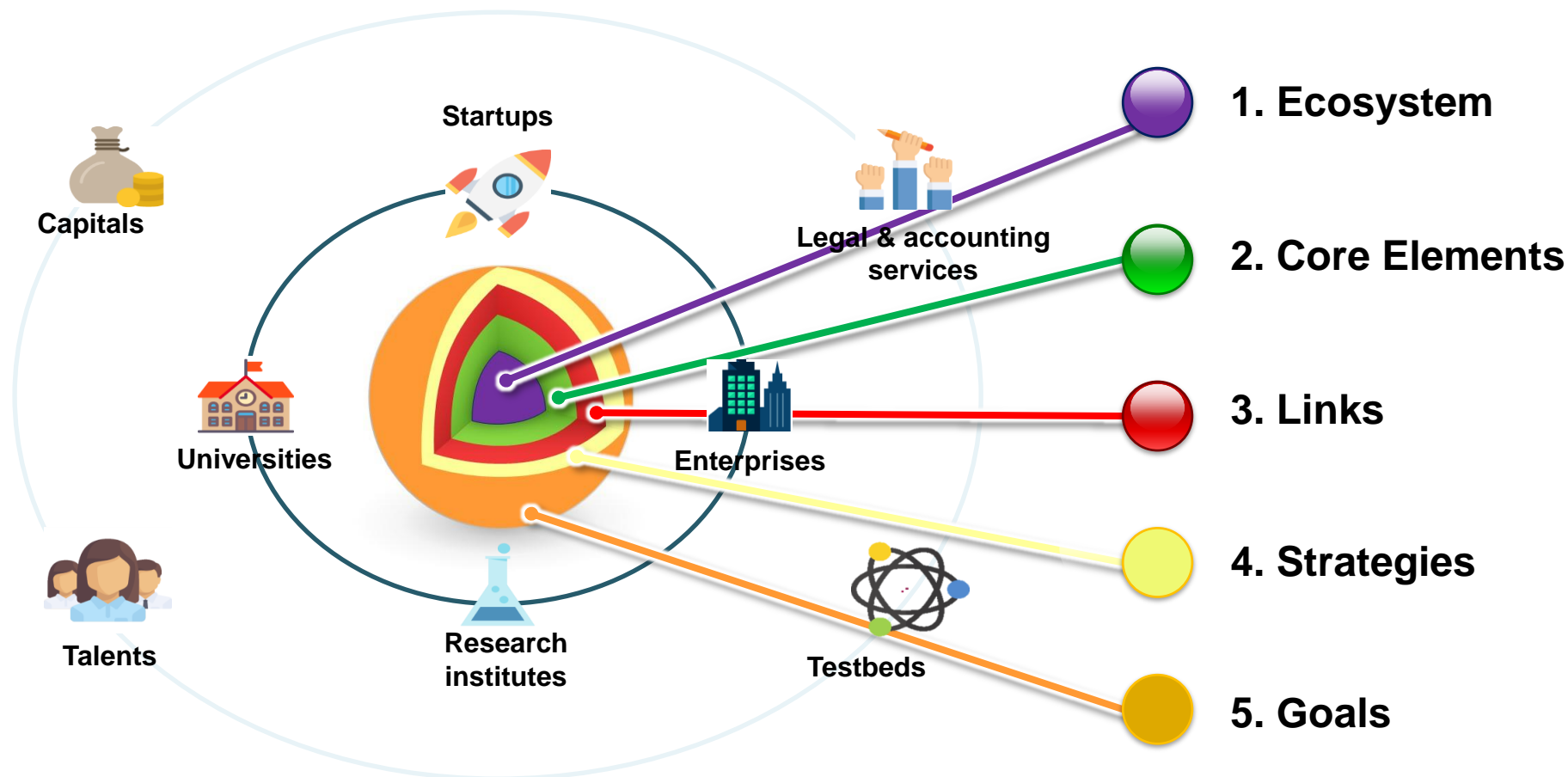
6 Key Strategies:

1. Infrastructure for digital innovation (DIGI+Infrastructure)
2. Talents and skills for innovation (DIGI+Talent)
3. Digital transformation for industries (DIGI+Industry)
4. Human rights in open internet and digital society (DIGI+Right)
5. Smart cities with public-private sectors (DIGI+Cities)
6. Digital services and globalization (DIGI+Globalization)



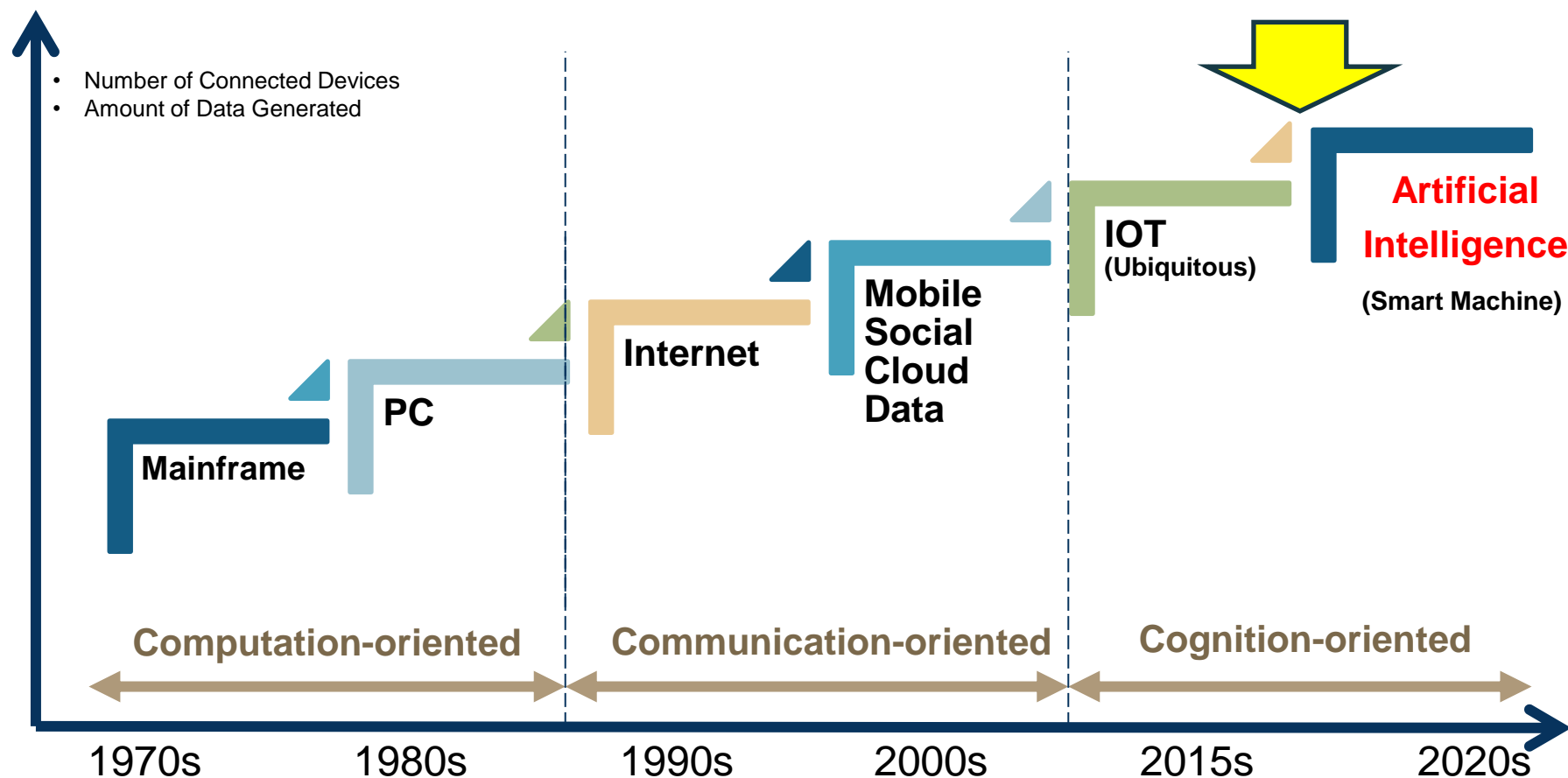
Goals for Asia • Silicon Valley Development Agency (ASVDA) on IoT & Entrepreneurship

- Connect to **Silicon Valley** and other global tech clusters
- Develop **industries** for the next generation
- Become an innovative startup destination for **young Asians**



Post-IoT era with Artificial Intelligence

Integration of Big Data, Computing Power, and User Experience(Algorithm)



AI as “X factor” to Enable Digital Transformation for Taiwan

Taiwan publishing Digital Nation Initiatives 「數位國家・創新經濟發展方案 (DIGI+) 」

- “Artificial Intelligence” as the Key Driving Factor for cultivating the Enabling Technology and Digital Talent

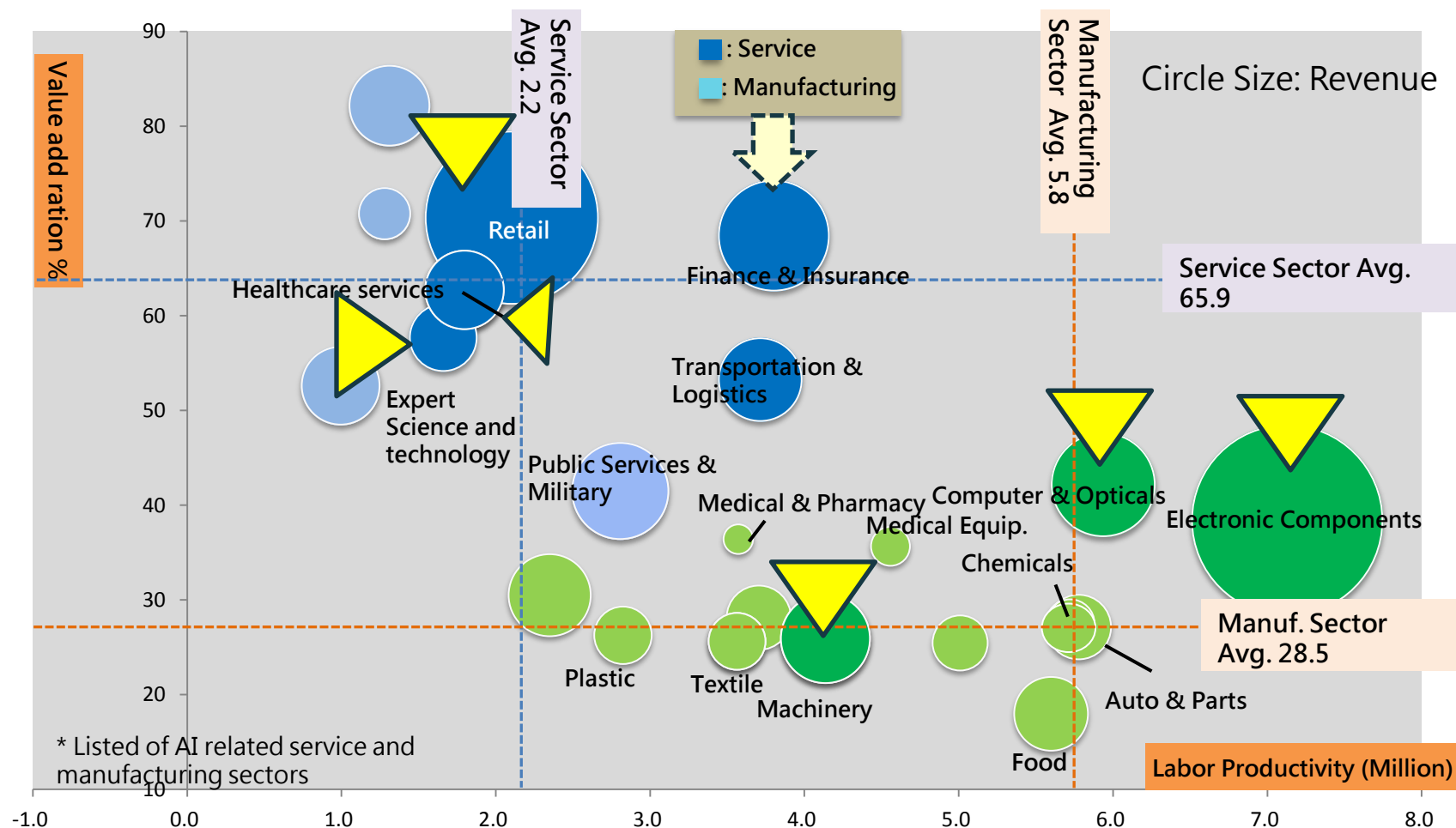
AI as “x factor” to scale-up Taiwan’s strength and to drive the innovation with S/W & H/W integration by domain knowledge:

- “AI X Smart Transportation”: Smart City application
- “AI X Smart Services”: Converging ICT and service interoperation
- “AI X Smart Manufacturing”: Value-added the manufacturing intelligence
- “AI-PU Chip”: Enabling AI semiconductor ecosystem
- Others: ”AI X Smart Retail”, “AI X Smart Healthcare”, “AI X Smart Travel”...etc.

**“AI X” would be the key success factor for Taiwan
in the era of digital economy**

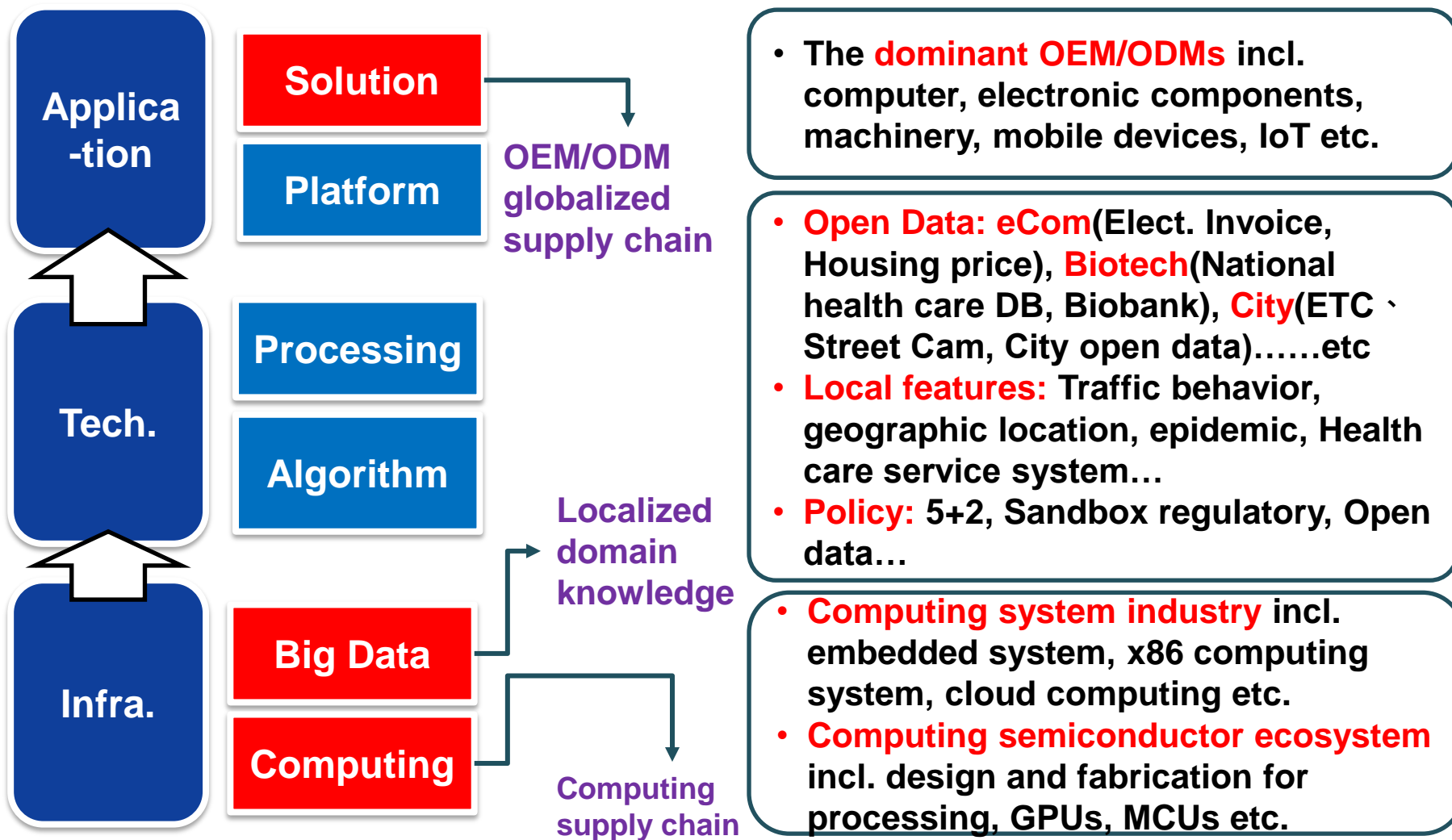
Targeting AI-powered Service Sectors

- AI “Supply”: Electronic components, Computer and Electronics, Machinery
- AI “Demand”: Retail, Financial & Insurance, Medical and Healthcare, Expert Services



Note: Value add ration=value add/revenue; Labor productivity= Revenue/# of Labor

AI-related Ecosystem in Taiwan



- Leveraging the strengths on OEM/ODMs, localized domain DB(biobank, Cybersecurity..) and semiconductor for AI-enabled economic transformation

Solve Local Problem, Happy City, Healthy Economy



Intelligent Transportation Cases in Taiwan

ETC/eTag



Today:

- 1.5M/day cars
- 14M/day transactions
- 99.97% accuracy
- 2015 ITS World Congress Industry Award



Future development

- Integrated Smart Transportation Services
- Customized Business Model and Services
- Enabling Smart City
- Export Integrated systems

4G Traffic Control Initiative

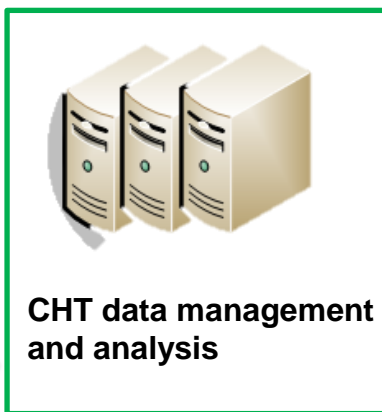
Complete monitor equipment



4G traffic detector

- Other traffic information
- Accident information (Public sector)

Analyze traffic flow



CHT data management and analysis

Traffic control cloud



Real-time traffic control

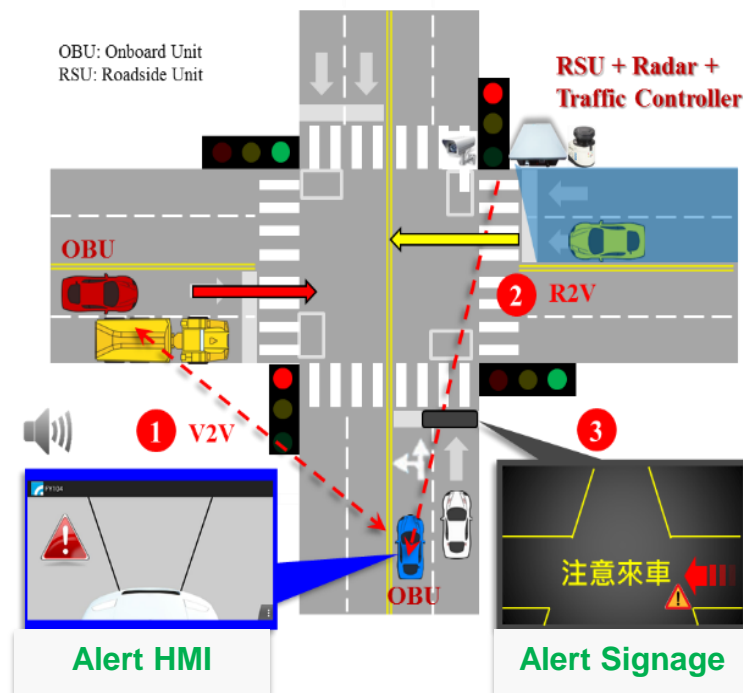
Traffic information cloud



Real-time traffic information App

ITRI Case: Smart Traffic Project for Intersection Movement Assist (IMA)

IMA: Warns the driver when it is not safe to enter an intersection, ex. when something is blocking the driver's view of opposing or crossing traffic.



① IMA V2V Alert

- WAVE/DSRC Wireless Comm.
- Follow U.S. V2V Mandate

② IMA R2V Alert

- Integrate mmWave Radar
- Integrate traffic controller to alleviate congestion

③ IMA Signage Alert

- Allow the car without OBU to access the alert from outside

ITRI Case: Green Fleet Solution for Local Wholesale Market

- Xiluo, Yunlin: Biggest fruit and vegetable wholesale market with 1/3 share in Taiwan but **serious air pollution and noises** from hundreds of diesel trucks.
- **EVs and services system** to solve the local issues with testing and verification, and to build self-sustain components and maintenance supply chain.
- Export to overseas market with local references(over 800 EVs in Taiwan) and assembly factory in Philippines



Diesel truck



Electrified truck



Central Taiwan-
Xiluo Yunlin



Low-speed EV



Southeast Asia-
Philippines

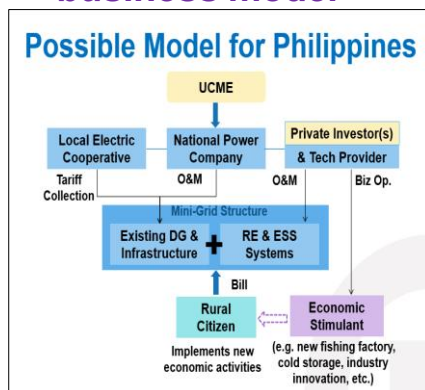
ITRI Case: Smart Energy Solution for Southeast Asia

- Southeast Asia as the target for Smart City innovation system and service
 - Demand survey and market intelligence
 - Linkage Taiwan industry to fulfill the local needs by technology cooperation
- ITRI as the platform to link the overseas government and Taiwan industry by innovated system and services integration
 - ITRI/IEK and GEL built the reference cases in Philippines, Laos and Vietnam

Demand: Cost of energy generated by Diesel engine due to transportation problem



Solution: Micro-grid investment and business model



Demand: Application Solar demo project by APO

Solution: MOU between Taiwan industry and Power Corp. solar project



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Taiwan Needs to be Part of Global Team

Only US Can Feature an Entire Team by Itself



U.S. Team



vs. International Team



Team USA

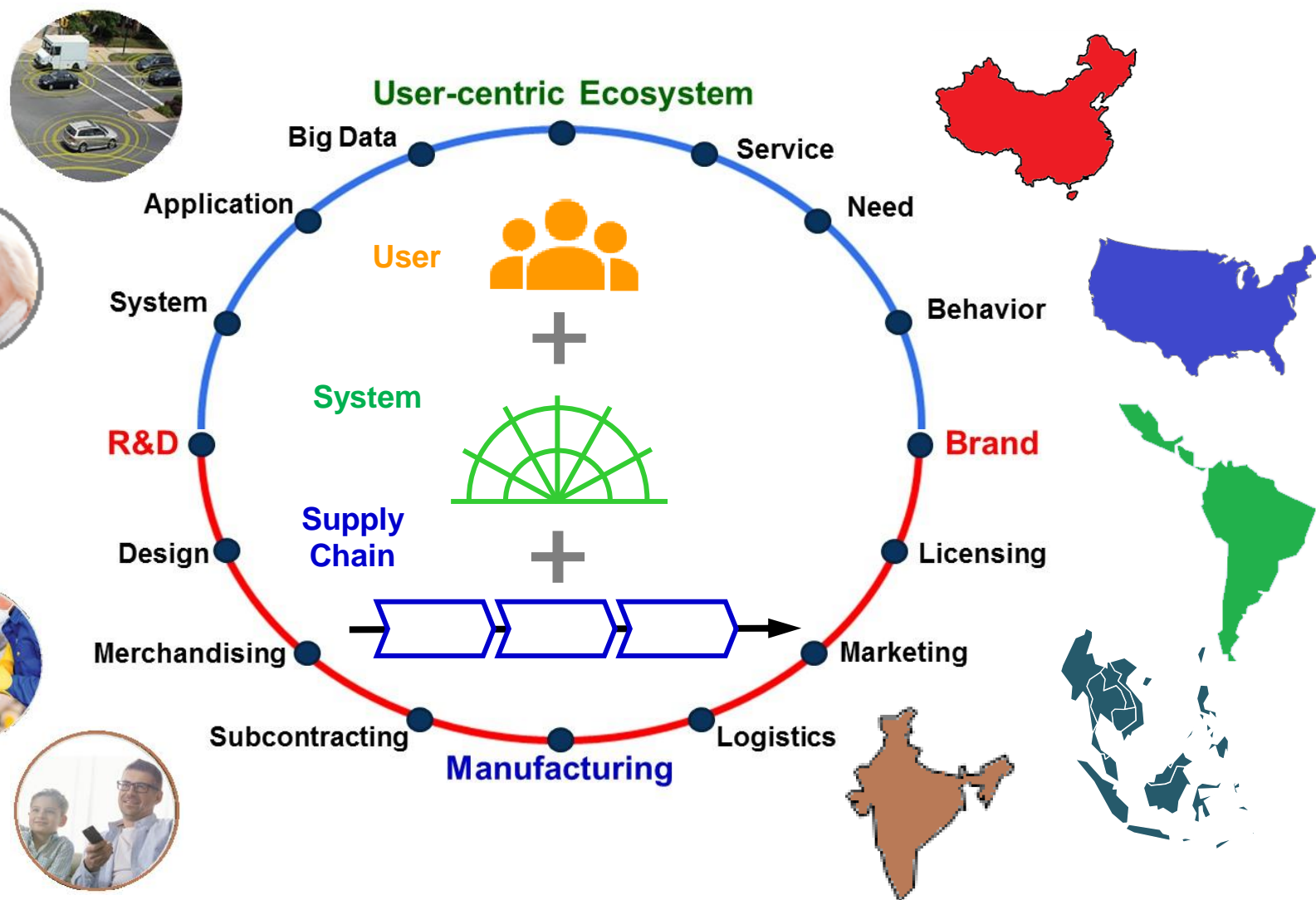


vs. Team Europe



Connecting User-centric Ecosystem

Meet User Needs & Create Value by System Integration



Conclusion

- **“AI X”** as the key driver for new economy
 - Data-driven and AI-enabled for value-added service and manufacturing sectors
 - Digital innovation infrastructure and newly start-ups ecosystem
- **“User-centric Ecosystem”** to create value with system integration
 - Control user-centric ecosystem, open innovation by public-private sectors, local test-beds for solution trials, service and operational system verification
- **“Smart city”** reference cases based on local pain points and citizens’ participation
 - Team-up to solve the local issues, testing/verification and export

Thank You

IEK View

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**Industrial Economics & Knowledge Center (IEK)
of Industrial Technology Research Institute (ITRI)**



Professional Experiences:

- Principal, Roland Berger Strategy Consultants, Shanghai
- Sr. Director, Consumer Electronics BU, Primax Electronics Ltd., Taipei
- Sr. Director, Corporate Development, Primax Electronics Ltd., Taipei
- Case Leader, Boston Consulting Group (BCG), Hong Kong
- Applications Engineer, Semiconductor Group, Motorola, Phoenix

Professional Specialty:

- Strategy, operations Improvement, organization change management, business process redesign, new product development and marketing, investment due diligence, manufacturing management
 - Chairman of Committee on Policy and Legal, Cloud Computing & IOT Association in Taiwan (CCAT) (2010-Present)
 - President, Asia Pacific Industrial Analysts Association (APIAA) (2017-Present)
 - Consultant Committee of Science & Technology Policy Research and Information Center (2015-Present)
 - Taiwan Food and Drug Administration(TFDA) Food Safety Technology Project Performance Evaluation Committee
 - Ministry of Economic Affairs(MOEA) Industrial Development Advisory Council
- Multiple patents in power switching control and mobile phone applications