Universities at the Forefront

of Thailand's Transformation

Suvit Maesincee
Minister of Science & Technology

We are passing through the Sea of Changes

The Age of Extremity

Global Challenges

The Age of Paradox

The Age of Disruption

The Age of Extremity

- Climate Change
- Earth Quake
- Resource Scarcity

Nature's Extremes

Political Extremes

- Unconventional Regimes
- Institutionalized Radicalism
- Terrorist Organization

- Skillset Divide
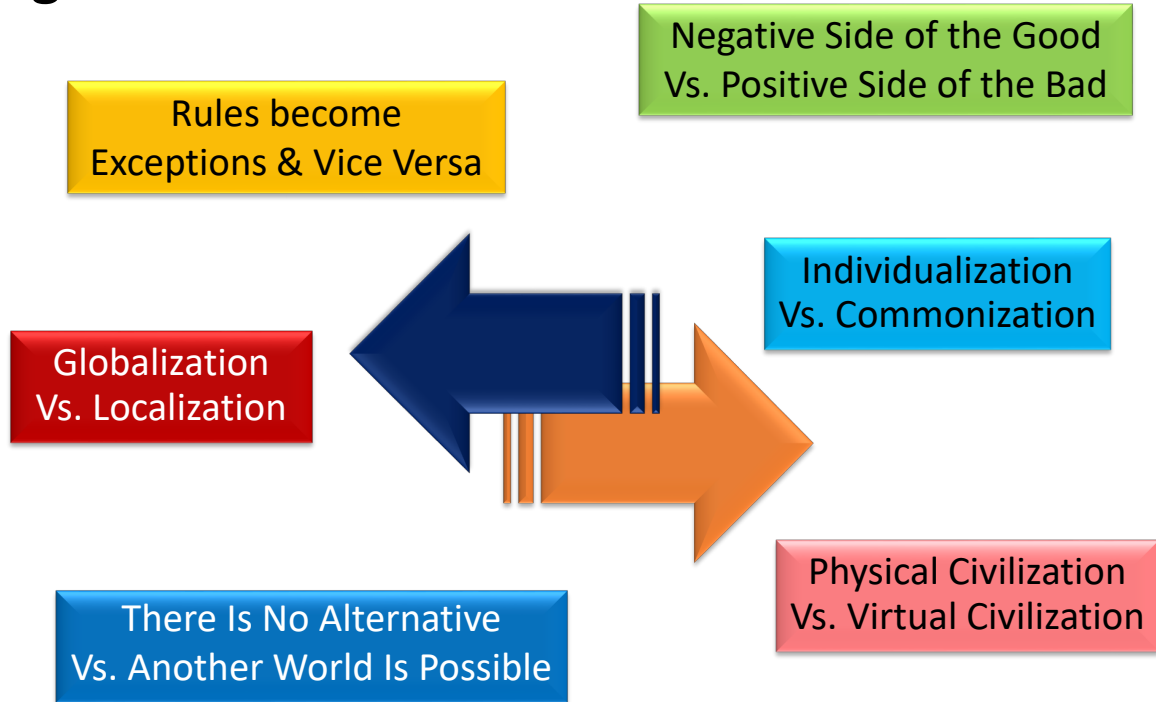- Systemic Inequality
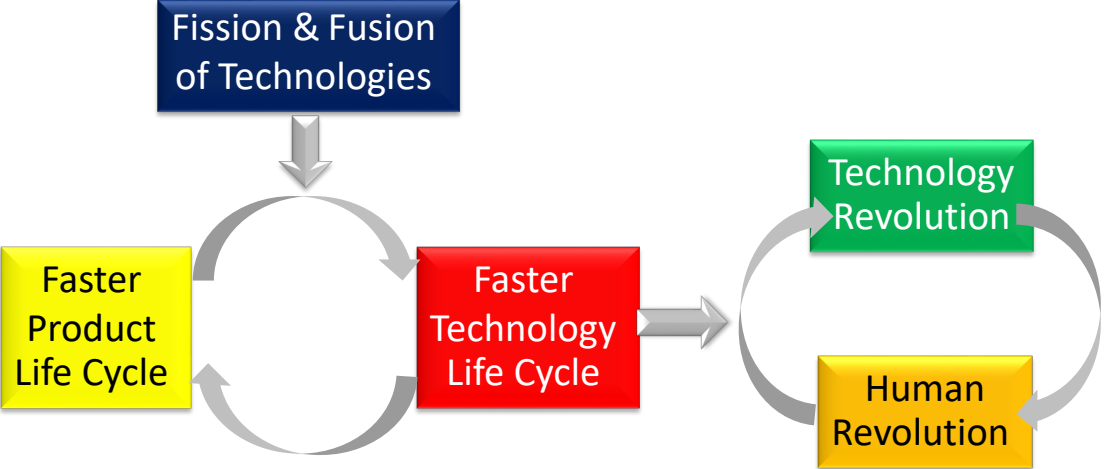- Social Unrest
- Mass Migration

Social Extremes

Economic Extremes

- Concentration of Wealth
- Tragic Middle Class
- Extreme Poverty
- Competing for Talents

The Age of Paradox

Negative Side of the Good
Vs. Positive Side of the Bad

Rules become
Exceptions & Vice Versa

Individualization
Vs. Commonization

Globalization
Vs. Localization

Physical Civilization
Vs. Virtual Civilization

There Is No Alternative
Vs. Another World Is Possible

The Age of Disruption

The Circle of Future Setting

The Age of Extremity

The Age of Paradox

The Age of Disruption

Global Challenges

Regulatory & Policy Sandboxes

Strategic Transformation
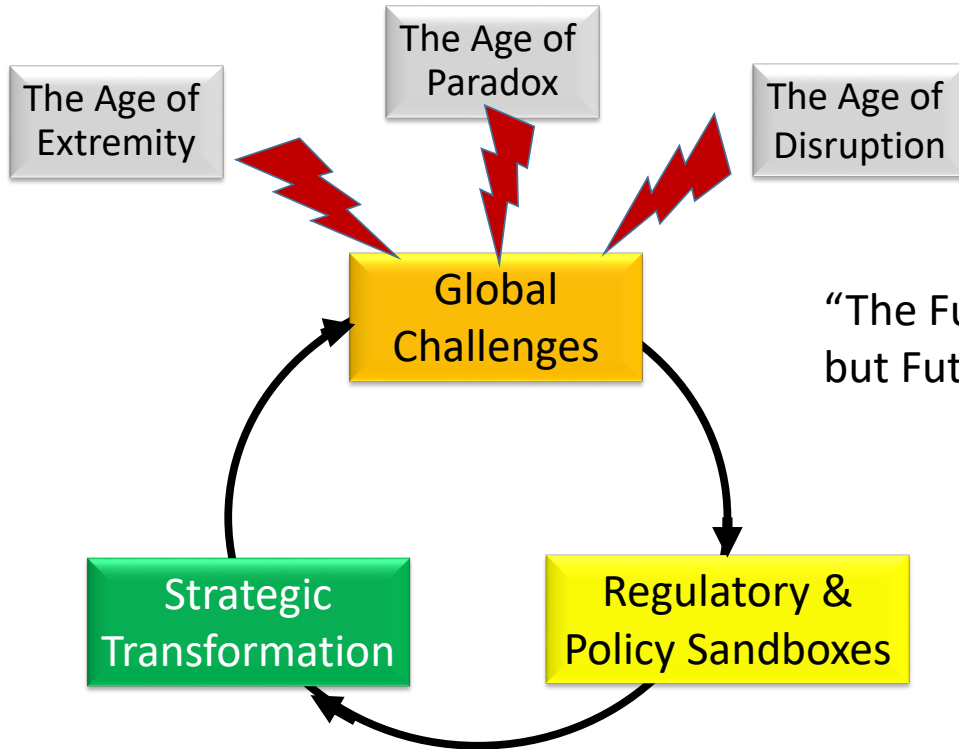
"The Future cannot be Predicted but Future can be Invented"

Dennis Gabor

Regulatory & Policy Sandboxes

Regulatory & Policy Sandbox

Future Lab

Policy Lab

Gov. Lab

Living Lab

Social Lab

Counter-Disruptive Change

Adaptive Change

Transformative Change
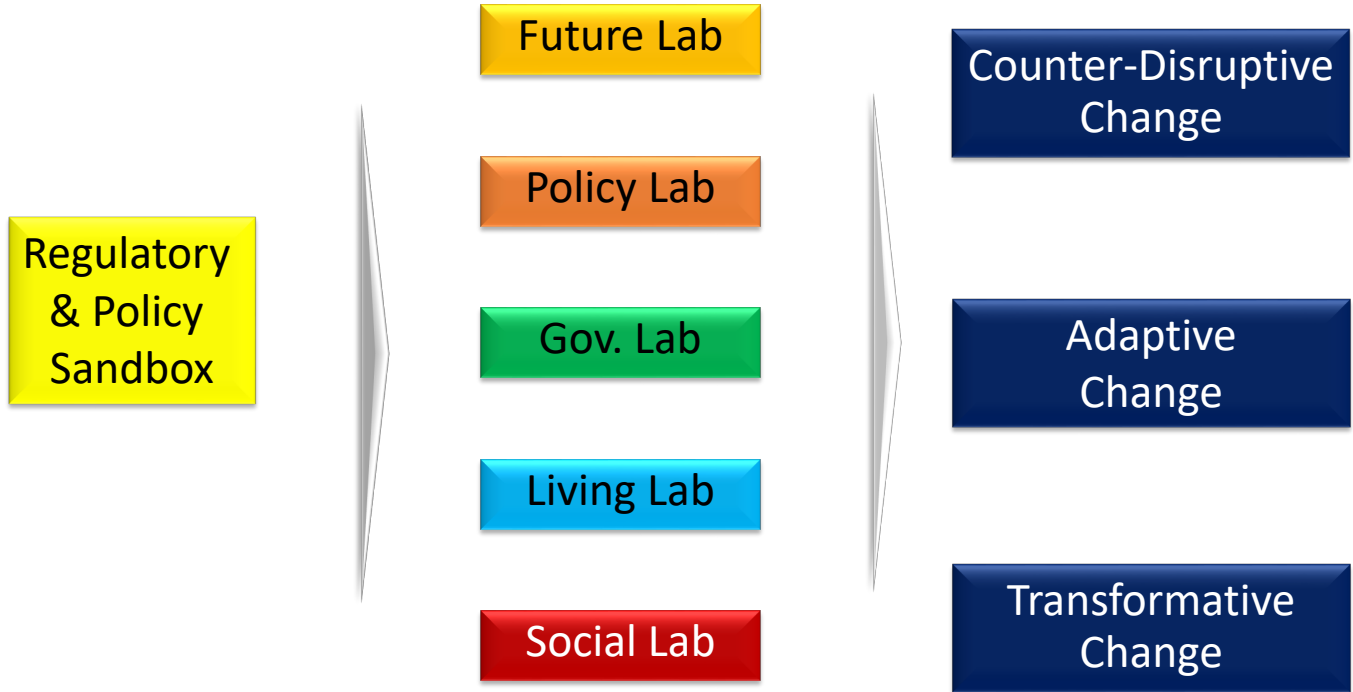
Future Lab

Future Scanning:

- Trend Analysis
- Trend Monitoring
- Trend Projection
- Model and Simulation
- Consulting Experts
- Polling
- Delphi
- Brainstorming

Scenario Planning:

- Weak Signal
- Driving Force
- Forecasting and Backcasting
- Future Wild Cards
- Scenario Building

Future Consultation:

- Workshop
- Coaching
- Training
- Conferences
- Publications

- Sweden: Council on the Future, Minister of the Futures
- Singapore: Centre for Strategic Futures
- Korea: Ministry of Science, ICT and Futures Planning
- UAE: Ministry of Cabinet Affairs and Future

Policy Lab

Policy Design:

- Policy Design Workshop
- Behavioral Insights Workshop
- Prototyping

Policy Testing:

- Policy Sandbox
- Pilot Projects
- Pilot Areas
- Model and Simulation

Delivery Design:

- Mechanism Design
- Delivery Value Chain Mapping
- Delivery Partner Networking

- UK: Cabinet Office Policy Lab, NESTA Innovation Lab
- Australia: Behavioural Insights Unit
- Canada: Innovation Hub, Privy Council Office, Change Lab, Employment and Social Development
- USA: OPM Innovation Lab, Public Policy Lab
- Denmark: MindLab

Gov. Lab

Public Service Redesign:

- Design Thinking (Human-centered approach)
- Empathize with all stakeholders (e.g., A day in the life of ordinary people)
  - Observe how citizen use public services
  - Interview people to learn about their pain points
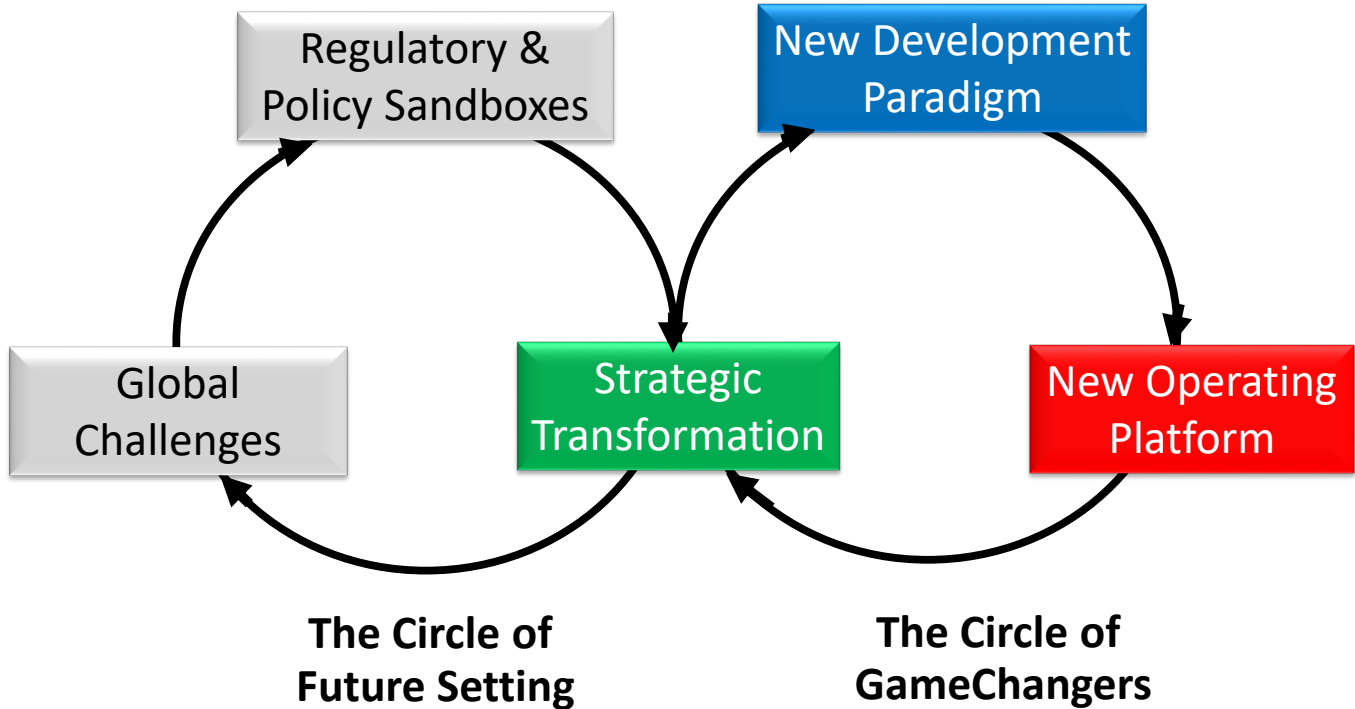
Co-Creation Space & Experiment:

- Create Innovative Space
- Collaborate for holistic outcomes
- Experiment to try ideas and test assumptions
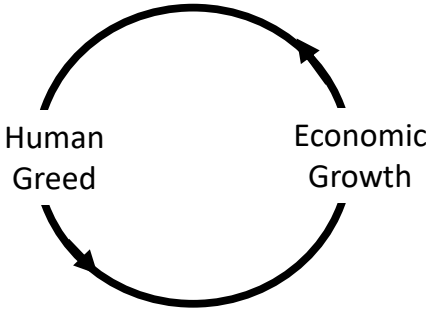
Strategize the Rollout:

- Public Service Reform
- Organization Reform
- Capacity Building (New Mindset and New Skillset)

- Singapore: The Human Experience Lab, Public Service Division

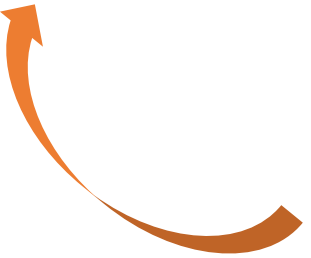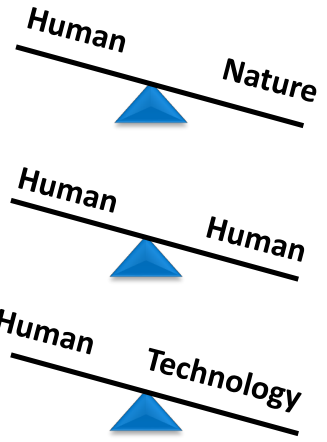# The Circle of GameChangers

Economic Growth as the Development Paradigm

The New Development Paradigm

Thriving in Balance

Human Wisdom	Economic Wealth	→	Innovative Economy	→	Human — Nature △
	Social Well-Beings	→	Distributive Economy	→	Human — Human △
	Environmental Wellness	→	Regenerative Economy	→	Human — Technology △
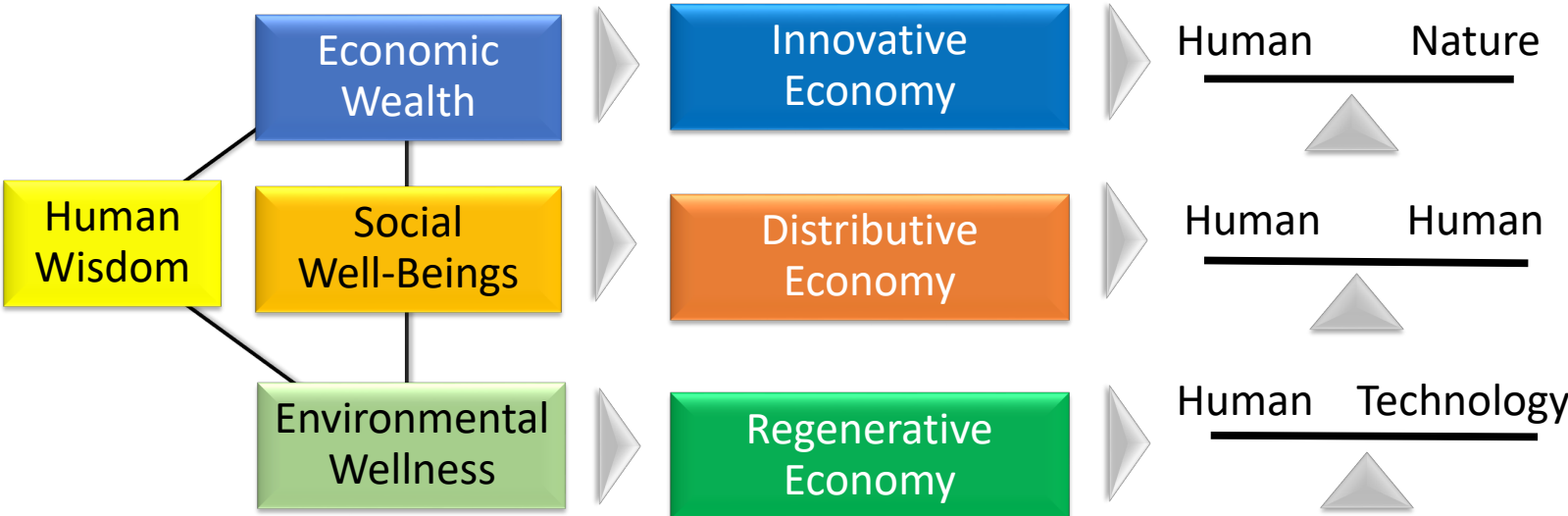
Innovative Economy: Roadmap to Prosperity

Focus on Financial & Physical Capital → **Focus on Talent & Technology** → **Prosperity**

- Enhancement of Science Literacy, Digital Skill Literacy, Information Literacy, and Media Literacy
- Heavily Investment in Science & Technology, R&D
- Research & Innovation Cluster Development
- Incubation of Technology, Design, and Creativity Entrepreneurs
- Innovation-Driven Enterprises Development
- Skill Development for the Future
- Ease of Doing Innovation Business
- Management of Digital Platforms
- Etc.

Distributive Economy: Roadmap to Stability

| Concentration of Wealth & Opportunities | → | Distribution of Wealth & Opportunities | ▸ | Stability |

- Immunization for the Bottom 40% of Income Distribution
- Negative Income Taxes for Low-Income People
- Modernization of Agricultural Sector
- Educational Quality Improvement
- Re-Skilling, Up-Skilling & Multiple-Skilling
- Start-ups and SMEs Promotion
- Social Enterprises Promotion
- Regional & Provincial Development Strategies
- Formation and Distribution of Innovation Hubs
- Local Economy Development
- Public-Private Collaboration
- Etc.

Regenerative Economy: Roadmap to Sustainability

Unplanned Utilization of Natural Resources	➡	Well-planned Conservation & Utilization of Natural Resources	**Sustainability**

- Disaster Risk Management
- Smart City and Livable City
- Non-Carbon Based Society
- Environmental-friendly and Clean Technology Business & Production
- Paradigm Shift from 'Cost Advantage' to 'Lost Advantage'
- Being "Doing Good, Doing Well" Organizations
- Etc.

Building a "Caring & Sharing" Society

M-Society

- Rational Economic Men
- Ego-Centric (Self)
- Nature as Resource
- People for Growth
- Making Things

W-Society

- Socially Responsible Men
- Eco-Centric (SELF)
- Nature as Source
- Growth for People
- Making Skills

Building a "Caring & Sharing" Society

The New Operating Platform

Technological Revolution

The Rate of Accelerating Return

Human Revolution

Physical Civilization		Dual Civilization
Social System	→	Socio-Technical System
Physical Humanity	→	Digital Humanity
Physical System	→	Cyber-Physical System
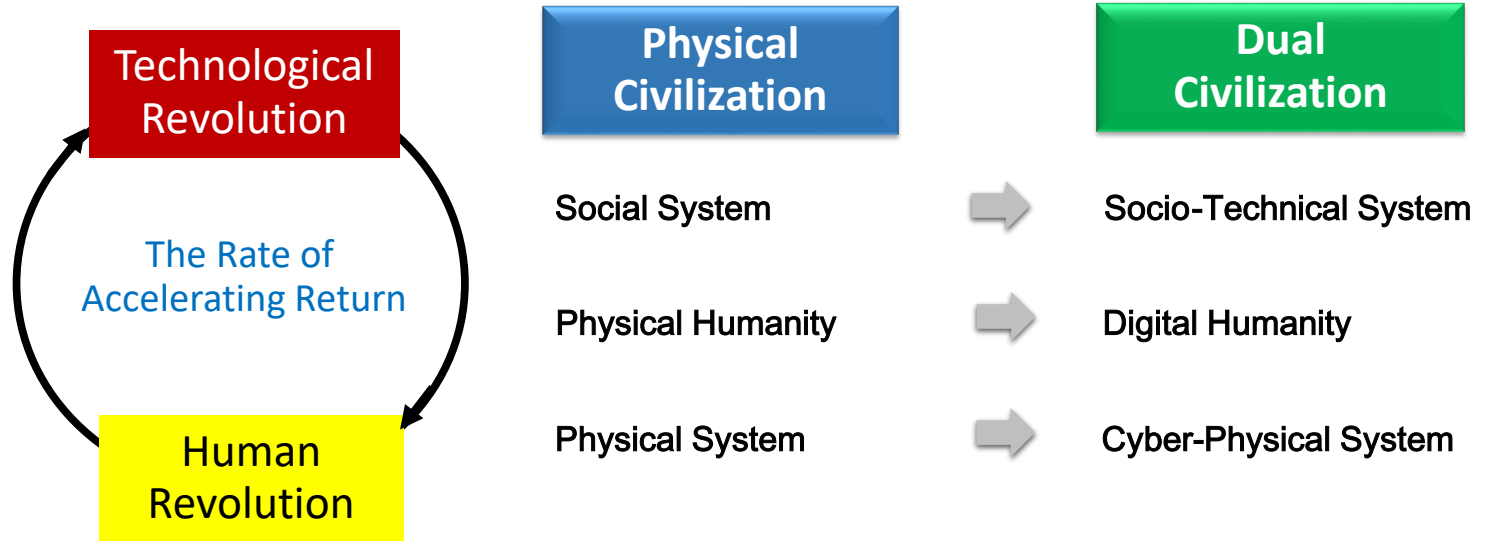
We are ending a 4 billion years-old hegemony of **"Darwinian Evolution"**

Cyber-Physical System

Physical Place

Execution by Machines & Robots

Data Collection by Sensors & Devices

Market Place

Materialization by 4D printers

Cyber Space

Integration via VR & AR

Market Space

Analysis by AI, etc.

Accumulation as Big Data

Source: Society 5.0
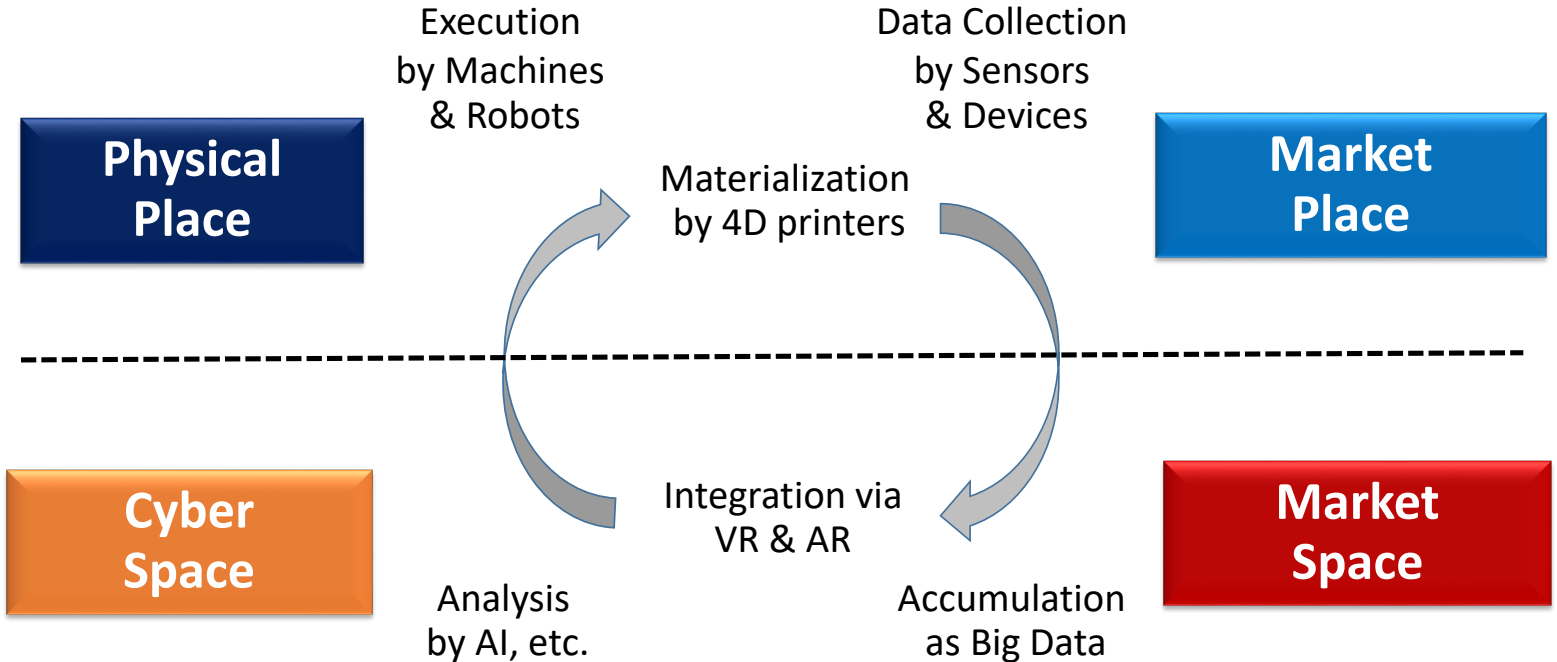
The Dual Operating Model

Socio-Technical System

Digital Humanity

Cyber-Physical System

Minds   Machines

Products   Platforms

Core   Crowd

The Circle of Innovative Capacity

The Circle of Innovative Capacity

Regulatory & Policy Sandboxes	Balanced Development Paradigm	High Skilled Talents	
Global Challenges	Strategic Transformation	Dual Operating Platform	Research & Innovation

Circle of Future Setting

Circle of GameChangers

Circle of Innovative Capacity

High Skilled Talents

Minds   Machines

Products   Platforms

Core   Crowd
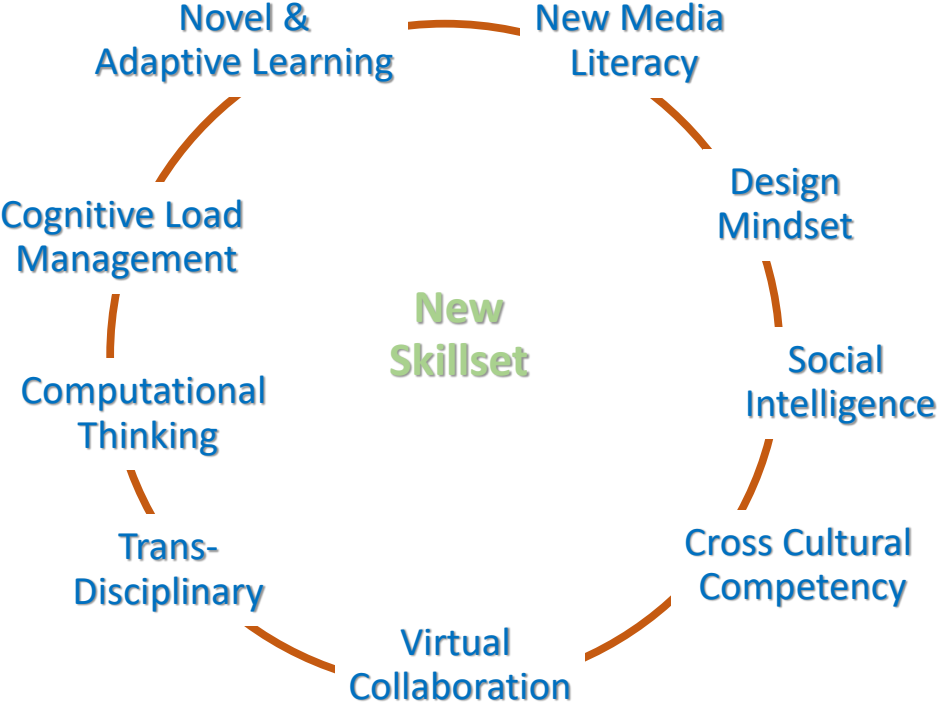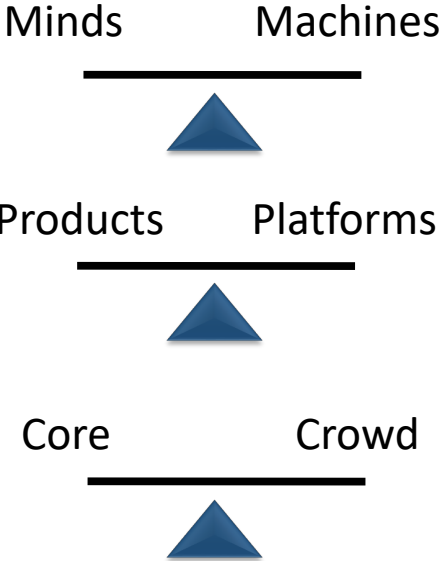
Source: Andrew McAfee, Erik Brynjolfsson/ TIME : The Future of Work

New Skillset

- Novel & Adaptive Learning
- New Media Literacy
- Design Mindset
- Social Intelligence
- Cross Cultural Competency
- Virtual Collaboration
- Trans-Disciplinary
- Computational Thinking
- Cognitive Load Management

Turning Head, Hand & Heart On
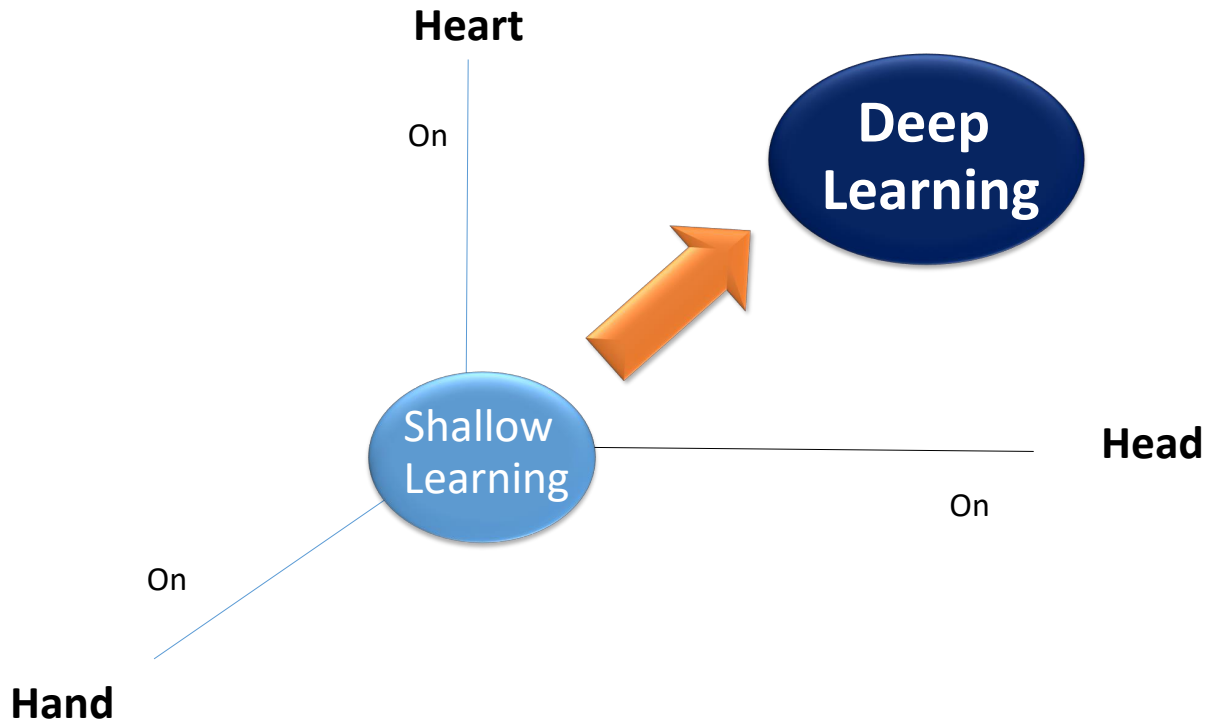
Research & Innovation

Key Technologies of National Importance

R&I Priority with Area Setting

Innovation Account

PPP Investment In R&I

Competitiveness Fund

Budgeting & Procurement Reform

Research Procurement

Talent &Technology Development & Acquisition

Technology Financing

Talent & Technology Localization

Global/Regional/ Local Collaborative Networks

EECi/RSP/ISP
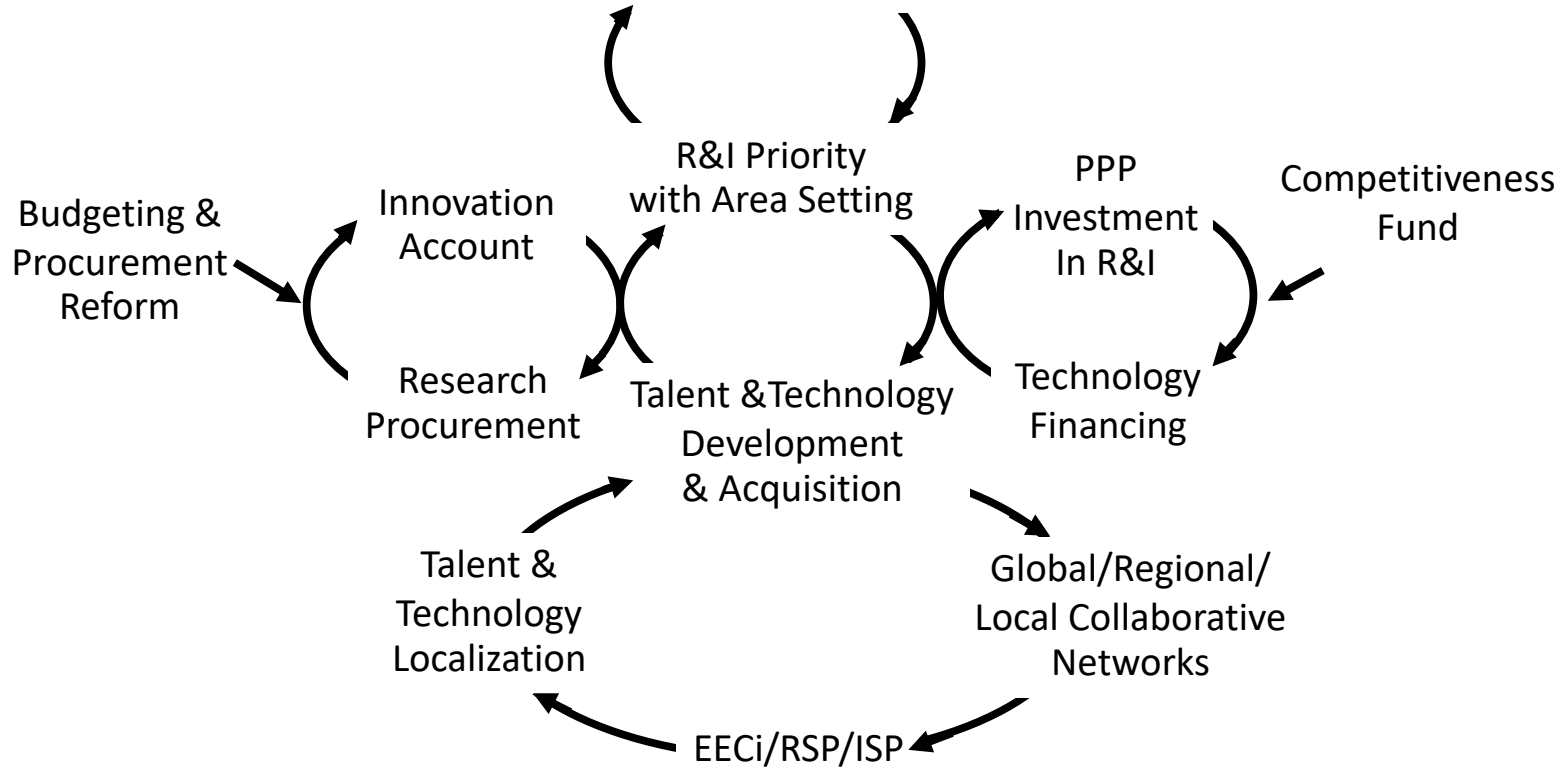
Key Technologies of National Importance
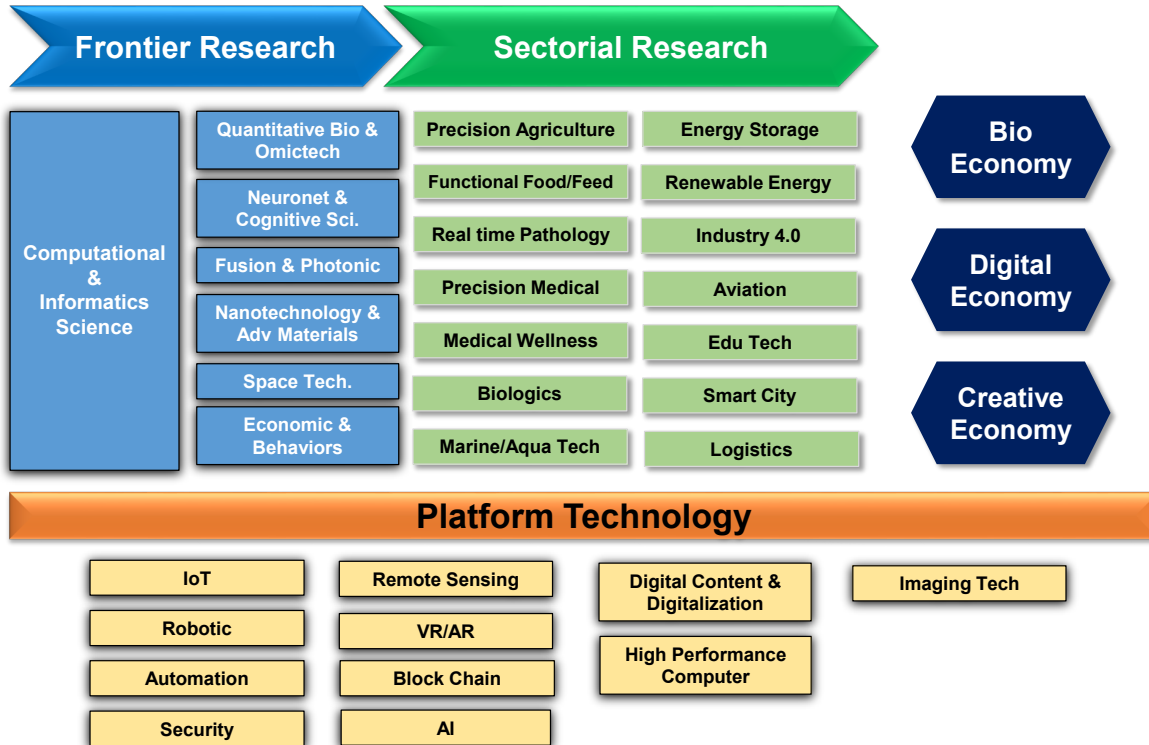
Research & Innovation Agenda
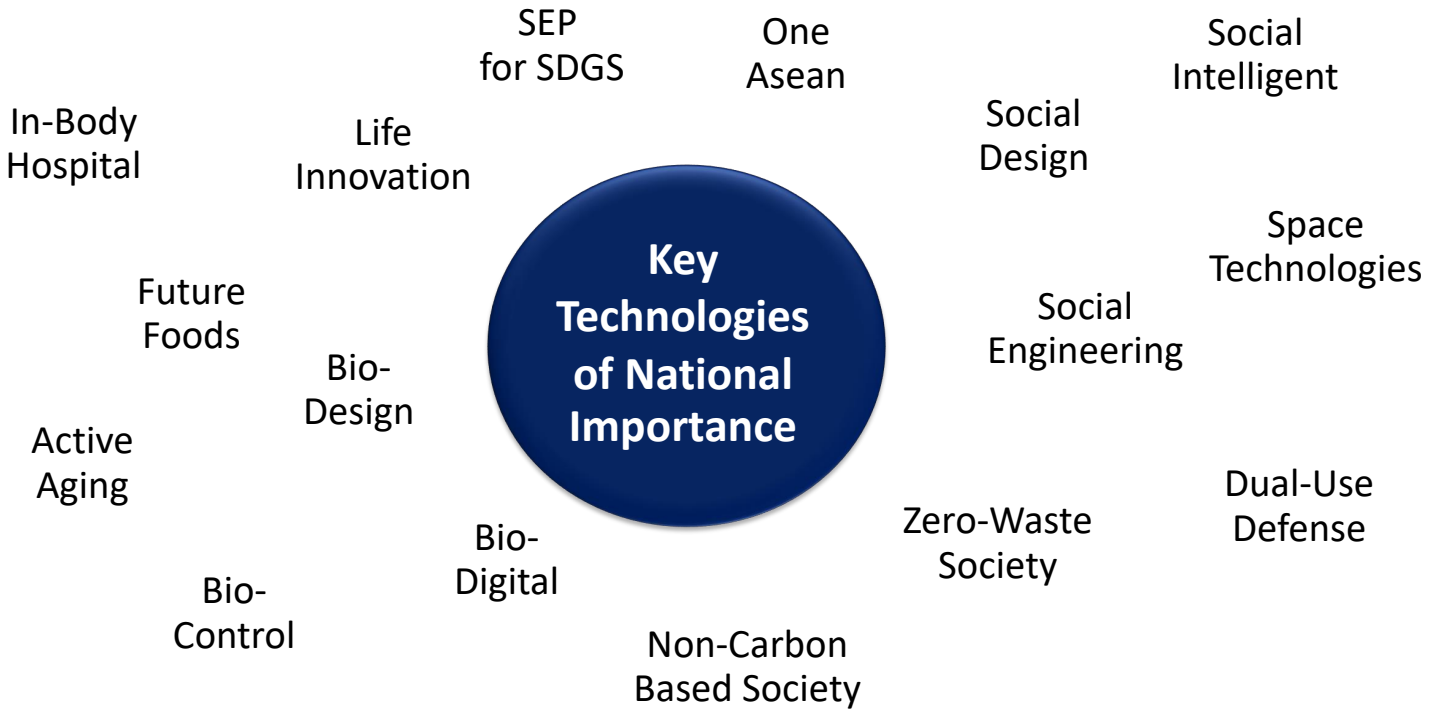
R&I Priority

- Bio-Industry Technologies

- Medical & Drug Design Technologies

- Life Care & Support Technologies

- Manufacturing Technologies

- Automated Driving Technologies

- Energy Storage & Saving Technologies

- Material Development Technologies

- Digital Platform Technologies

R&I Prioritization with Area Setting

Bio-Industry Technologies

Bio-Bank	Gene Editing	Green Extraction	Nano-Encapsulation

Life-Care & Support Technologies

In-Body Hospital   Hospital In the Home

Medical & Drug Design Technologies

e-Health/m-Health   Tele-Medicine   Personalized Medicine   Bio-Metrics   Bio-Sensors

R&I Prioritization with Area Setting

Automated Driving Technologies

Probe Vehicle System   Internet Car   Cars As Sensors

Manufacturing Technologies

Fab on Internet   Personal Fabrication   Do It Yourselves

Digital Platform Technologies

Cybersecurity   Networks   Processing

Area-Based Management, Informatics &Technology System

Hydro Big Data

Agronomic
Soil Surveying
Fertilizing
Breeding
Post Harvesting

GNSS
Innovation
Operational Data Service

THEOS-2

Water Management
Irrigation System
Water Control

Drones

Crop Models
Yield Prediction
Water Use
Disease and Insect
Simulation

THAIWATER

Crop Monitoring
Crop Identification
Crop Growth
Crop Conditions
Yield Estimation
Damage Assessment

Farmers
Yield & Production
Socio-Economic
Experience
Planning

Thailand 4.0

Intelligence Analytics Platform

GISTDA PORTAL

Geospatial Big Data

TPMAP
Thai Poverty Map & Analytics Platform

Agri-Map
ค้นหาที่ดินเข้าสู่ฐานะ Agri-Map Online

Farm-based Solution

KM Engine

Local Sensors
Water Leveling
Hyperspectral Camera

Agro-Climatic Networks
Rainfall
Air Temperature
Solar Radiation
Spectroradiometer
Soil Moisture
Greenhouse Gas

Farm Machinery
Autonomous Tracker
Weeding
Spraying
Fertilizing

Ease of Doing Innovation Business

- National Quality Infrastructure

- Innovation Lists

- Research Procurement

- B/D Act

- Regulatory & Technical Sandboxes

- IP Management System

- Start-Up Business Act

Are Universities Ready to Change Thailand ?