

The ASEAN Smart Cities Network



Total of 26 cities

<https://www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf>



Information Session about the Capstone Project 2020

Facilitated by

TAY Kok-Chin

Chairman

Smart Cities Network (SCN)

2nd July 2020



Purpose of this Information Session

- 1. The NUS School of Computing (SoC) would like to invite Partners to collaborate by offering Industry Projects for Year 3 and 4 students for their Capstone Projects starting Aug 2020.**
- 2. This Information Session is meant for NUS SoC to give an overview of what this Capstone Project is all about – objectives, expectations and timeframe.**
- 3. Industry Partners are then expected to suggest their projects, in partnership with Smart Cities Network (SCN), to establish a process for Industry Transformation to develop the Digital Economy for a Smart Nation**

Singapore

Partnering the National University of Singapore (NUS)



Singapore

National University of Singapore

25th

World University Rankings 2020

24th

World Reputation Rankings 2019

2nd

Asia University Rankings 2019

<https://www.timeshighereducation.com/world-university-rankings/national-university-singapore>

Developing Future Leaders for a Smart Nation



School of Continuing and Lifelong Education

Master of Science (Industry 4.0)
Capstone Project
(Jan-June 2020) - **COMPLETED**



Office of Student Affairs

Community Engagement
Graduating Students (6 months)
Current Students (1 year)
From June 2020



NUS | Computing
National University of Singapore

Dept of Info Systems & Analytics
Capstone Projects
(Aug-Nov 2020)

MSc Capstone Project on Industry 4.0 with NUS SCALE

Flexible programme structure



Modules unique to NUS MSc in I4.0

42 modules ranging from 2-4 MCs each

40 Modular Credits (MCs)

4 Core Modules (16 MCs)

1. Introduction to Industry 4.0 and Applications
2. Data Analytics for Sense-making
3. Digital Physical Integration in Industry 4.0
4. Digital Infrastructure and Transformation Systems

10 Graduate Certificate (GC) courses to choose from

(Select one GC + a few other elective modules to make up 20 MCs)

1. Additive Manufacturing
2. Data Mining and Interpretation
3. Deep Learning for Industry
4. Digital Business
5. Digital Supply Chain
6. Intelligent Sensing Systems
7. Internet of Things
8. Pattern Recognition Systems
9. Principles and Practice of Secure Systems
10. Quality Assurance and Yield Optimization

Final Core Module (4 MCs)

Industry Consulting and Application Project

CORE MODULE (IND5005)
Industry Consulting and Application Project

This capstone project is meant to help students apply what they have learnt to companies in areas of operations concerning Industry 4.0.

Working in teams and in consultation with the relevant NUS academic unit, students would **develop a prototype solution** based on an implemented project in a company, craft a report about it and then present it for evaluation at the end of the module.

https://scale.nus.edu.sg/programmes/graduate/MSc-Industry-4_0

The Partnership with NUS Students

1. This partnership is to prepare NUS students with **life skills** in the development of **Smart Cities in ASEAN**, aligned to the **UN SDGs**.
2. The **LEAP (Learning Entrepreneurship via Attachment Program) for Smart Cities** has the following components and objectives:
 - a) Develop **Future Leaders for Singapore** as a Smart Nation /Cities
 - b) Learn how **Industry 4.0 Technologies** to transform industries
 - c) Learn **Life-Skills** (the 7 Habits of Highly Effective People, Design Thinking, Business Model Canvas, etc) by applying them in executing the Collaboration Projects.
3. It is a Technology Entrepreneurship Program to address these city challenges.

The NUS Project Teams will support the Smart Nation Initiatives **Digital Government**, **Digital Economy** and **Digital Society**.

NUS Community Teams

Four Strategic Thrusts of Digital Society:

- ❑ Expand and Enhance **Digital Access for Inclusivity**
- ❑ Infuse Digital Literacy into the National Consciousness
- ❑ Empower Community and Businesses to Drive Widespread Adoption of Technology
- ❑ Promote Digital Inclusion by Design

Partnership to achieve the UN Sustainable Development Goals

Key initiatives to build a digitally-ready workforce:

- SkillsFuture Singapore
- TechSkills Accelerator (TeSA)
- Smart Nation Scholarship
- Smart Nation Fellowship
- Centre of Excellence for ICT and Smart Systems

https://www.smartnation.gov.sg/docs/default-source/default-document-library/smart-nation-strategy_nov2018.pdf?sfvrsn=3f5c2af8_2

Digital Readiness*

DIGITAL ACCESS

DIGITAL LITERACY

DIGITAL PARTICIPATION

- Having ready access to affordable, inclusive and trustworthy infrastructure



- Having the motivation and skills to use digital technologies with confidence



- Using technology to achieve a better quality of life (e.g. convenience in day-to-day activities, better social and economic outcomes)



- Being a positive online influence

* Framework developed based on studies of other countries' definitions of digital inclusion and digital literacy, including the UK, US, Australia and Hong Kong

Digital readiness also encompasses:



Protecting against and mitigating the negative impact of technology (e.g. cyberbullying and social isolation)



Connecting communities by leveraging opportunities afforded by technology (e.g. on digital platforms)

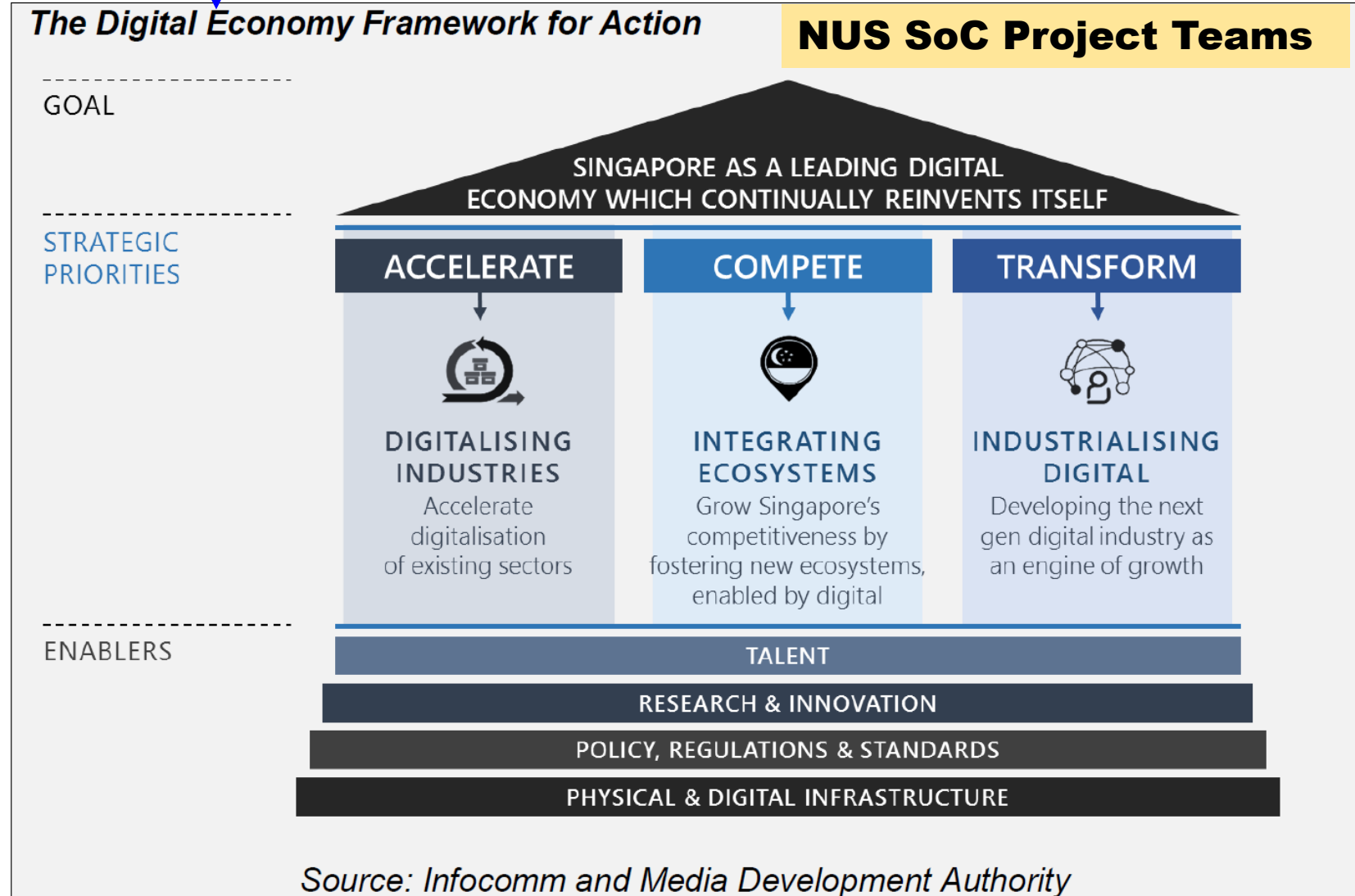
In Singapore, a Smart Nation (“City”) means **Digital Government**, **Digital Economy** and **Digital Society**.

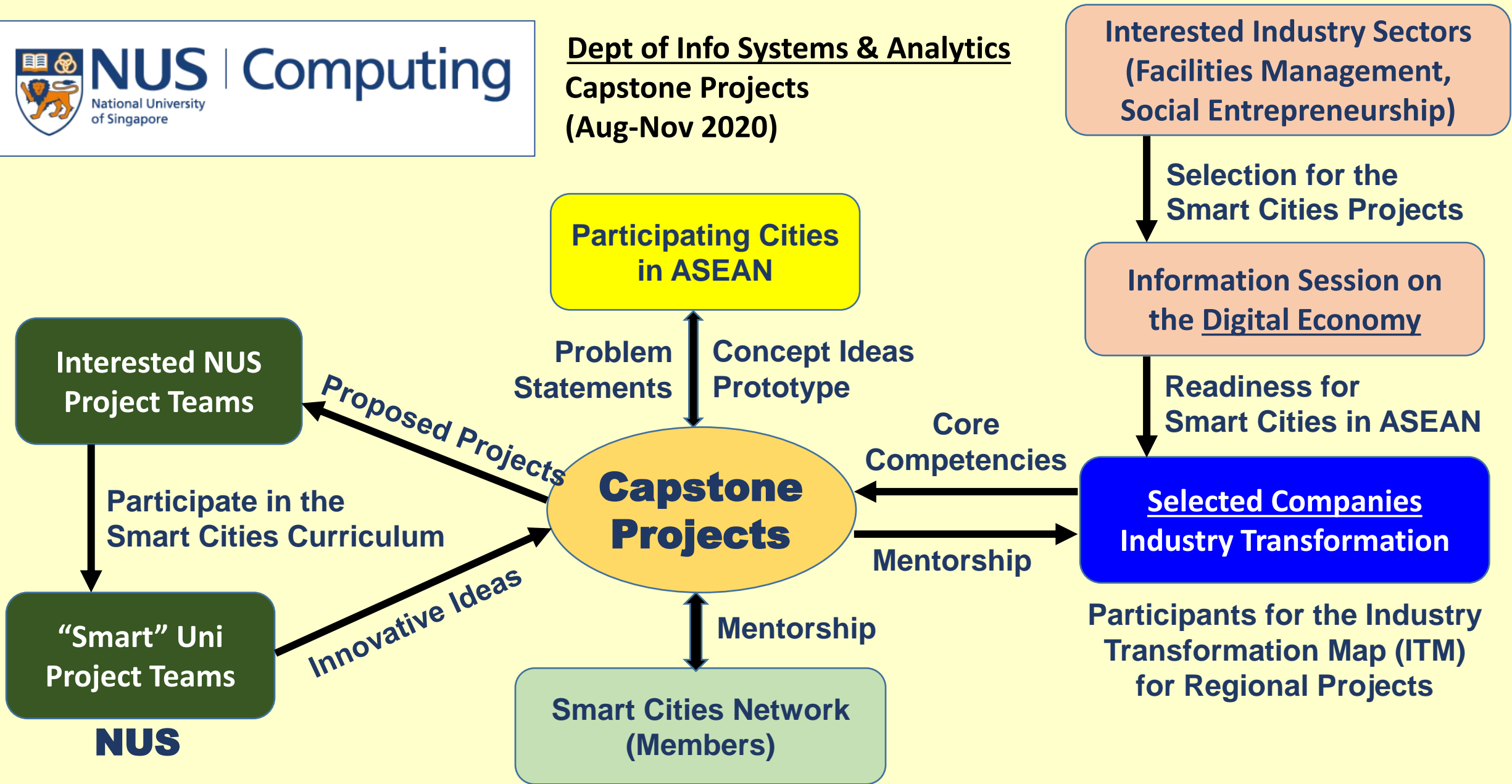
“Our economic agencies have a bold vision of digitalizing every industry and every business, raising productivity and efficiencies to grow the economy.

In 2017, the Government rolled out **23 Industry Transformation Maps (ITMs)** as part of the efforts under the Committee of Future Economy.

Supporting these ITMs are **Industry Digital Plans** to facilitate digitalisation in selected industries.”

https://www.smartnation.gov.sg/docs/default-source/default-document-library/smart-nation-strategy_nov2018.pdf?sfvrsn=3f5c2af8_2







Sharing about the Capstone Project 2020



Potential Capstone Projects 2020

- 1. Industry Transformation – Facilities Management**
 - a) EM Services (“Paperless Project Management”)**
 - b) Tenderboard (“e-Procurement”)**

- 2. Global Social Entrepreneurship**
 - a) Smart Cities Network (SDG 7 with UN ESCAP) – with Quadrus**
 - b) BoP Solution Centre (SDG 8 and related SDGs)**
 - c) Graffique (SDG 11 with Digital Twin)**

A Global Partnership in the Making

Learning Entrepreneurship via Attachment Programme (**LEAP**) for Smart Cities

Partner Organizations (NUS, Academic Institutions)

- Indicate Interests
- Value for Members
- Work with Industry Partners
- Business Model Discussion
- Replicate in other cities

CATALYST PROGRAM

1. An Introduction to 4th Industrial Revolution (IOT, Cloud, AI, Data, etc)
2. Fundamentals of Smart Cities Series (UN SDGs / Circular Economy, Smart Tourism, Food Security, etc)
3. Smart Infrastructure (Digital Twin)
4. Development of Personal & Soft skills

SCN and SCC Collaboration Program

- Already established partnership with National University of Singapore (NUS)
- Industry Projects in SG
- Model to be replicated in ASEAN.

Define Collaboration Projects in the US Europe, Singapore, ASEAN and Others

The Singapore Hub for UN SDGs at the SDG Center



The 17 Goals were adopted by 193 countries UN Member States in 2015, as part of the **Agenda for Sustainable Development** to:

- end **poverty**,
- protect the **planet** and
- ensure that all people enjoy **peace and prosperity** by 2030.

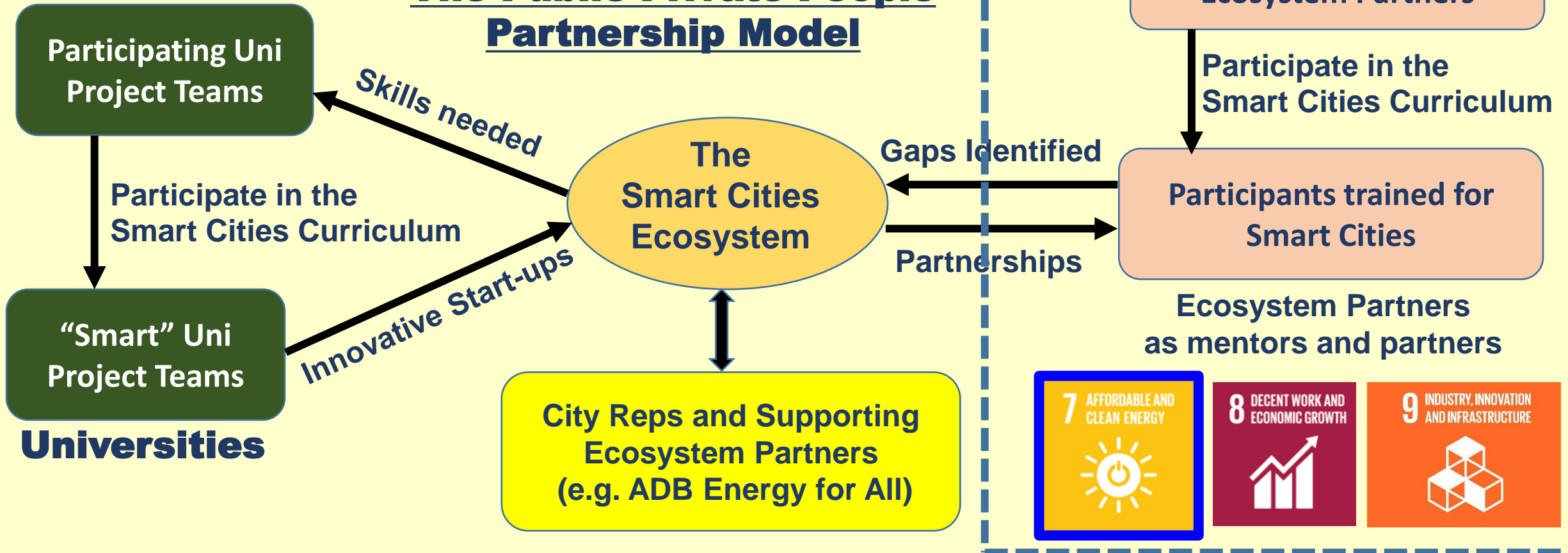
11 SUSTAINABLE CITIES AND COMMUNITIES



Make cities and human settlements inclusive, safe, resilient and sustainable

Developing the Smart Cities Ecosystem

The Public-Private-People Partnership Model



About United for Smart Sustainable Cities (U4SSC)

U4SSC is managed by Organization for International Economic Relations (OiER). United for Smart Sustainable Cities manages both a global set of KPIs and the Implementation Program.

The U4SSC KPIs have been developed with the support of **16 UN agencies** to become the **first global standard** for measuring and monitoring smart sustainable development at the local level.

U4SSC Implementation Program provides city level assessments and links cities to knowledge communities, solution providers and funding opportunities.

OiER as the **UN Charter Centre of Excellence for Smart and Sustainable Cities** is joining efforts with the leading tech business partner **Graffiquo**. The partnership will be focusing on the challenges of supporting local authorities and providing visual intelligence for decision making.



Partners for United for Smart Sustainable Cities (U4SSC)



UNECE

UN HABITAT
FOR A BETTER URBAN FUTURE



FINANCE INITIATIVE



Convention on Biological Diversity



Food and Agriculture Organization of the United Nations



United Nations Framework Convention on Climate Change



United Nations Economic Commission for Africa



WORLD METEOROLOGICAL ORGANIZATION



Empowered lives.
Resilient nations.



UNITED NATIONS



UNITED NATIONS UNIVERSITY

UNU-EGOV

Operating Unit on Policy-Driven Electronic Governance



United Nations Educational, Scientific and Cultural Organization



UN environment

United Nations Environment Programme

Idea: “Sister-Cities for a Smart ASEAN”

ART & CULTURE

Jakarta, Berlin celebrate 25 years as sister cities

KATRIN FIGGE
THE JAKARTA POST

February 24, 2019

Berlin / Sun, February 24, 2019 / 11:55 am



<https://www.thejakartapost.com/life/2019/02/23/jakarta-berlin-celebrate-25-years-as-sister-cities.html#:~:text=Indonesia%20and%20Germany%20have%20well,and%20Berlin%2C%20are%20sister%20cities.>

Indonesia and Germany have well-established relations on the political, economic and cultural levels, but what is perhaps a less known is that the capitals of the two countries, **Jakarta and Berlin, are sister cities.**

This year, Jakarta and Berlin are celebrating the 25th anniversary of this special partnership with a series of events.

The federal state of Berlin maintains partnerships with **17 cities worldwide**, most of which were established shortly before or after German reunification in 1990.

In addition to **Jakarta**, the cities are **Beijing**, **Brussels**, **Budapest**, Buenos Aires, **Istanbul**, **London**, Los Angeles, **Madrid**, Mexico City, **Moscow**, **Paris**, **Prague**, Tashkent, **Tokyo**, **Warsaw** and Windhoek.

Immediate Collaboration Projects in ASEAN - aligned to UN SDGs

The ASEAN Smart Cities Network



<https://www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf>

Collaborate with Regional and Country Hubs

- Development of Inclusive and Sustainable Smart Cities in ASEAN, aligned to the UN Sustainable Development Goals (SDGs)
- Leverage the Localisation of UN SDG 7 (Affordable and Clean Energy) effort in 2020 and 2021 by the UN Economic and Social Commission for Asia and the Pacific (ESCAP).
 - Completing the SDG7 Questionnaire (target of 15 to 20 cities in ASEAN)
 - Collaborate with the 3 cities for the Deep Dive Roadmap
 - ➔ - Jakarta SDG & Smart Office (Leader for Indonesia)
 - Cauayan City (Leader for the Philippines) and
 - Iskandar Malaysia (Leader for Malaysia).



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Smart City 4.0 Ecosystem Platform

Collaborator

Government

Co-Creators

Citizen

Academia

Media

Industry/Business/Investor

Other Governments

Invitation to Collaborate
In a Sandbox Project

Vision and Mission
JAKARTA CITY 4.0

By Jakarta Smart City Office

Technologies, Innovations and Collaborations

Cloud

Big Data

AI

IoT

Blockchain



Road Congestion



Medical Services



Parking space



Flooding



Waste Management and Recycling



Air Pollution



School education



Local government services



Public Transport



Drink Water



Unemployment



Green spaces

City's Problems

Citizen's Needs

Innovative City

Happy Citizens

Jakarta Smart City



Jakarta Smart City 4.0 Framework

2 Smart City Ends

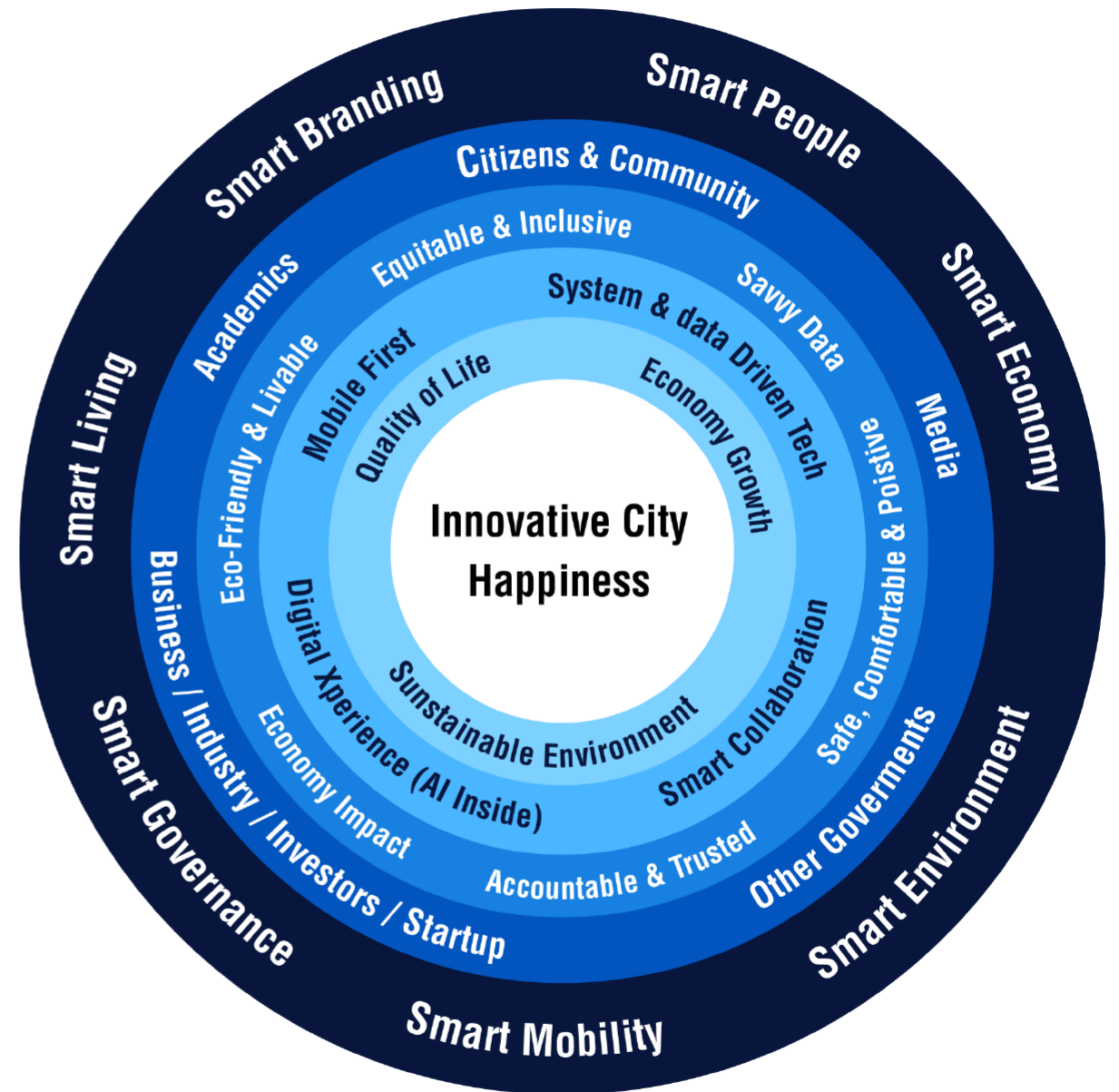
3 Values

4 Principles

5 Co-creators

6 Outcomes

7 Indicators





Provincial Government
of West Java

West Java Digital Province: Shifting Smart to Rural

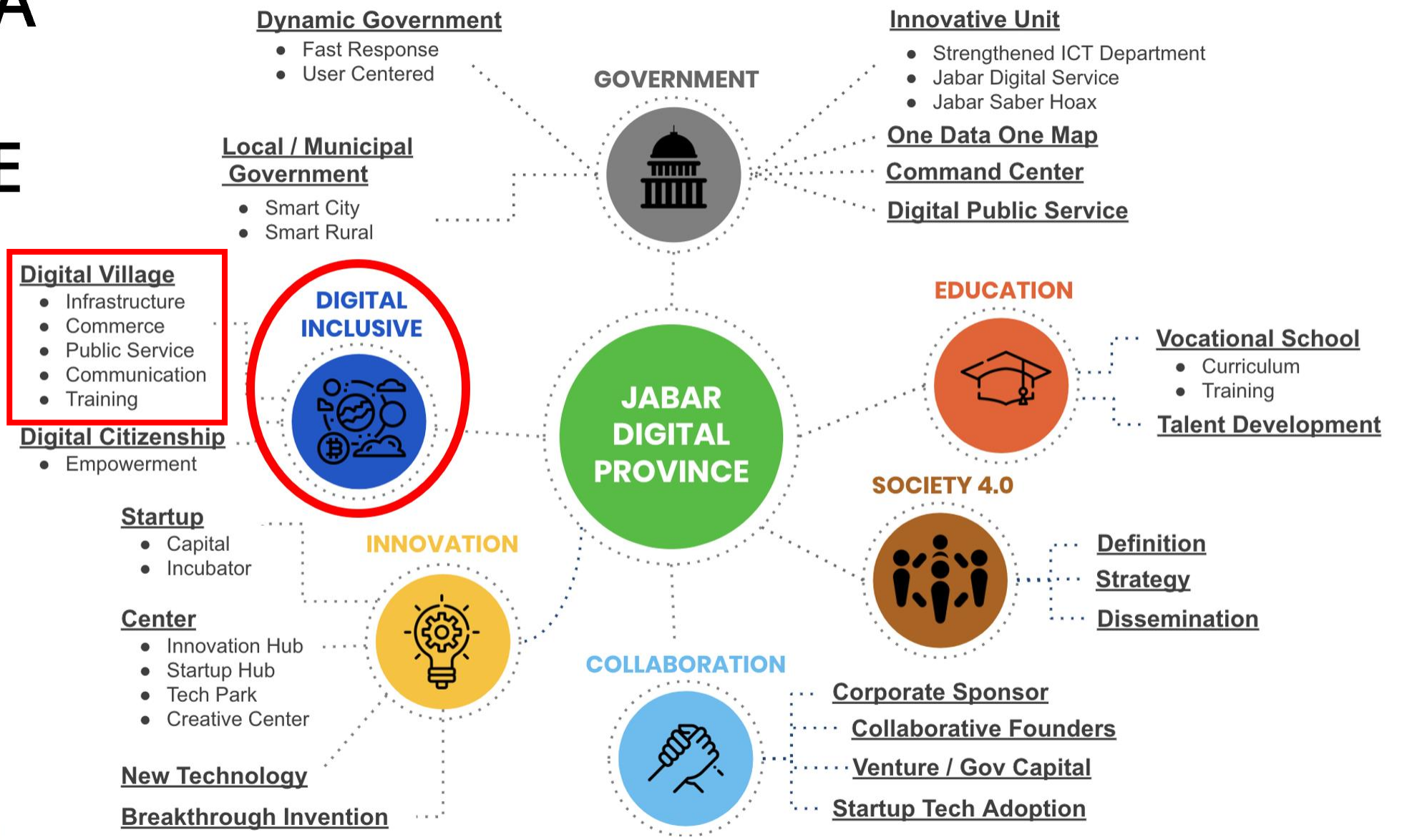
Setiaji
Head of West Java ICT Department



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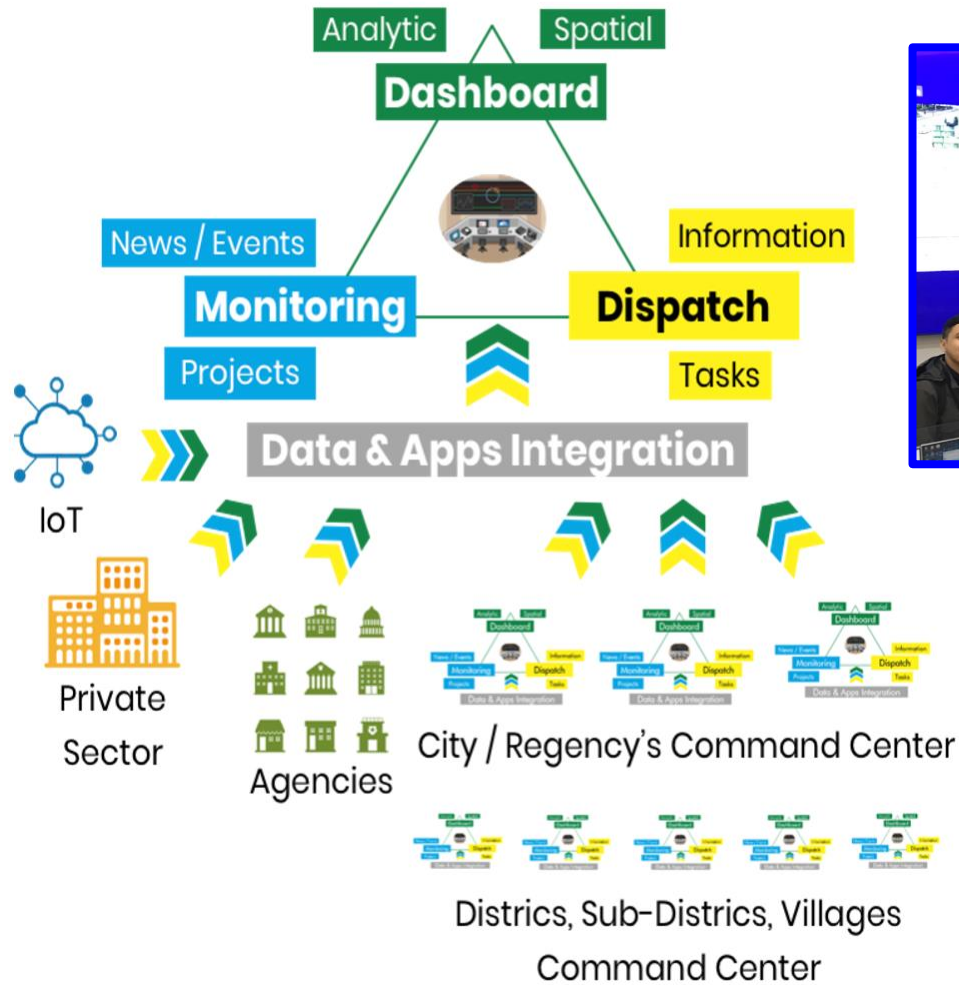
WEST JAVA DIGITAL PROVINCE

A Province of 48M People



COMMAND CENTERS : Government coordination and collaboration

2019 developments



WJDP Command Center



Immediate Collaboration Projects in ASEAN - aligned to UN SDG7

The ASEAN Smart Cities Network

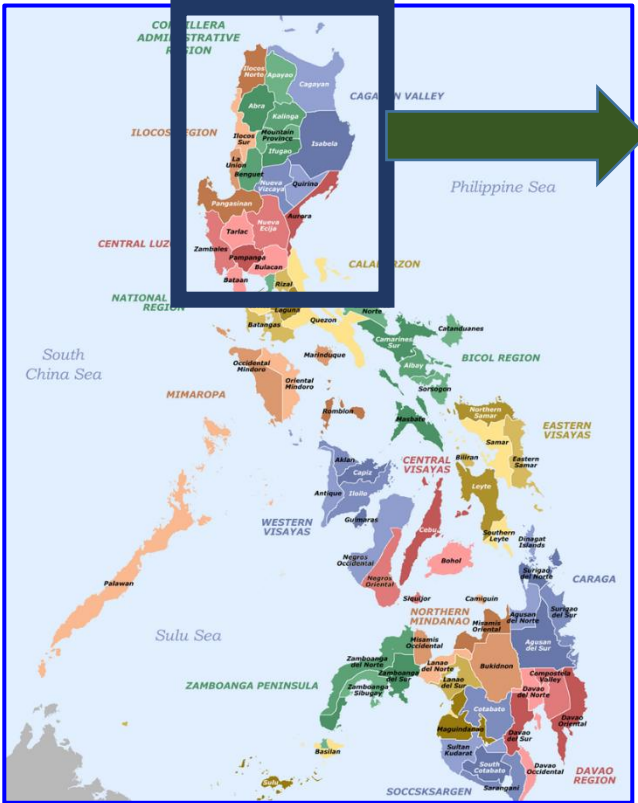


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<https://www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf>

The Philippines



Development of a Smart Province

Cauayan City, a key trade center of Isabela, as SMART Hub for Smarter and Sustainable Cities



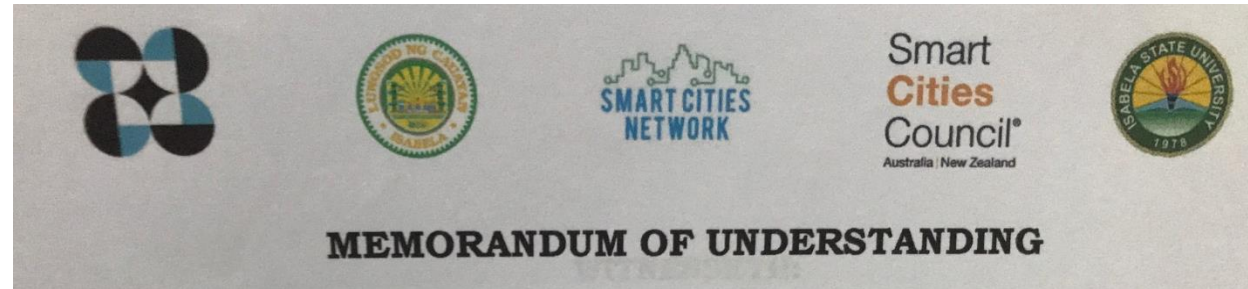
Co-Chairs of the Taskforce for Smarter and Sustainable Cities in the Philippines



**Background: MOU Signing for Smarter and Sustainable Cities
in the Philippines between Cauayan City,
Dept of Science & Technology (DOST), Isabela State University (ISU),
Smart Cities Council (SCC) and Smart Cites Network (SCN)
25th January 2019**

Isabela State University (ISU)

Center of Excellence (CoE) for Smarter and Sustainable Cities in the Philippines



1. To encourage the proactive, innovative, ecosystem and entrepreneurial approach towards **creation and development of training programs** to collaborate with cities in the Philippines to develop As Smarter and Sustainable Cities;
2. To help **cities in the Philippines** to better understand what it takes for the city to be ready to become “Smart Cities;” and
3. To collaborate with the **Smart Cities Council** for their Readiness Program by jointly taking the approach to key stakeholders, sponsors and investors and extending support in **planning, design and implementation of Smarter and Sustainable Cities in the Philippines.**

MOU Duration: Jan 2019 – Dec 2021

Pilot Projects

Smart Food Security,
Smart Energy & City
Disaster Risk Reduction
& Management

Our Pilot Projects will
be in Alignment
to UN SDG
1, 4, 7, 8, 9, 11 & 13

<https://sustainabledevelopment.un.org/?menu=1300>



REPUBLIC OF THE PHILIPPINES
Province of Isabela
CITY OF CAUAYAN

HON. BERNARD FAUSTINO M. DY
CITY MAYOR



SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR CITY



Cauayan City as the SMART Hub in the North



Most Business-Friendly LGU Award – Oct 2019

Workshops and Pilot Project (Stage 3) with ISU


Stage 3

- Key Enablers**
- Government Support
 - Online Sessions & visits
 - Investment into cities
 - Digitalization of City
 - Partnerships

**Collaboration
Projects bet PH & SG**

- High-Level Scope of Pilot Project**
1. Alignment to Cauayan City's Goals for UN SDGs
 2. LEAP Curriculum – taught by ISU Staff and SCN
 3. Draw Investment into cities
 4. Digitalization of Food Supply Chain
 5. Facilitate Partnerships

Stage 1



MEMORANDUM OF UNDERSTANDING

**Readiness Workshop on
25th & 26th Jan 2019**

Hosted by Cauayan City
with LCP, DOST, ISU and Mayors

Stage 2



MEMORANDUM OF UNDERSTANDING

**Activator Workshop on
10th & 11th Jun 2019**

Hosted by Cauayan City
with DOST and ISU Teams

*E.g. IOT-Based Aquaponics for
Smart Agriculture*

Stage 4

Singapore



The Partnership with Isabela State University (ISU)

Learning Entrepreneurship via Attachment Programme (**LEAP**) for Smart Food Security

Partner Organizations

(NUS, ISU, Ecosystem Partners)

- Indicate Interests
- Value for Participants
- Work with Industry Partners
- Business Model Discussion
- Replicate in other cities

CATALYST PROGRAM at ISU

1. An Introduction to 4th Industrial Revolution (IOT, Cloud, AI, Data, etc)
2. Fundamentals of Smart Cities (covering UN SDGs, Smart Food Security, Landscape in ASEAN, etc)
3. Smart Infrastructure & Tools
4. Development of Personal & Soft skills

SCN and SCC ASEAN Collaboration Program

- Already established partnership with National University of Singapore (NUS)
- Industry Projects in SG
- Model to be replicated in ASEAN.

Define Collaboration Projects in Cauayan City, Isabela and Singapore



BUSINESS INTELLIGENCE FOR RESEARCH & DEVELOPMENT CENTER



Alignment to SDG 7

Pilot Project: Possible Involvement

Business Intelligence for R&D Center (BIRD-C)

1. **Overview of BIRD-C to participants**
2. **ISU Lead at BIRD-C to better understand about Smart Food Security**
3. **ISU to consider appointing a Project Team to work with local farmers – to introduce innovations.**
4. **ISU Project Team and Farmers to mutually agree on Expected Outcomes**



Integrated Urban Systems Partnership

By Localising SDG 7

Joint Effort by:



Partners in the Philippines

- 1. Identify Pilot cities with the League of Cities of the Philippines (LCP)**
- 2. Target Cities:**
 - a) “Smart Cities” in ASCN - Davos City & Cebu**
 - b) Cauayan (Isabela) – Confirmed for Deep Dive**
 - c) And other 2nd Tier Cities or Provinces**
- 3. Guide them to Apply for funding from the Asian Development Bank (ADB) & Other Financial Institutions**

Discussion on the Proposed Berlin-ASEAN Dialogue

Topic: **Development of the Smart District Berlin TXL**

Allotted time: 60 min / online meeting (Zoom/WebEx/...)

13th August 2020

Introduction: **Smart City Berlin**

Part 1) The Example Berlin TXL

Part 2) Urban Data Platform Berlin TXL **(Include NUS SoC Projects)**

- Data Platform concept
- Our data architecture
- Public vs. private players
- Outlook: IoT Data Platform: FIWARE as a new Standard
 - Developments in European cities

Part 3) Resilient District

- Impact of Covid19 on our SC strategy

Part 4) Questions & exchange

Next Step with Industry Partners

**COMPLETE Project Summary and Submit to LumiNUS Portal
- By 10th July 2020**

1. Industry Transformation – Facilities Management (**more to be added**)
 - a) EM Services (“Paperless Project Management”)
 - b) Tenderboard (“e-Procurement”)

2. Global Social Entrepreneurship (**more to be added**)
 - a) Smart Cities Network (SDG 7 with UN ESCAP) – with Quadrus
 - b) BoP Solution Centre (SDG 8 and related SDGs)
 - c) Graffiquo (SDG 11 with Digital Twin)

**Information Session by Industry Partners
- By end July 2020**

About the Consultant (Kok-Chin TAY)

- *Chairman of Smart Cities Network, a network of innovative solution and service providers based in Singapore, with collaboration arrangements to help develop smart and sustainable cities in ASEAN member states and globally.*
- *ASEAN Leader for Smart Cities Council, one of the largest network of ecosystem stakeholders for Smart Cities*
- *A pioneer in the Smart Cities sector, having led the IBM Smarter Planet and Smarter Buildings Global Alliances and project managed the Smarter Cities Challenge project for Singapore in 2012.*
- *Currently provides consultancy services related to Smart Cities to public and private sector, with innovative solution providers. Currently curate the ASEAN Smart Cities group as the regional thought leader and connected to top experts globally.*



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