

# Global Project Based Learning for Driving Innovation and HR Development



Hitoshi Nakamura

Professor, Dr.

Dean, Graduate School of Engineering and Science  
Department of Planning, Architecture and Environmental Systems  
College of Systems Engineering and Science

**Shibaura Institute of Technology**

# Shibaura Institute of Technology



**9,499**  
Total Enrollment

**AY2022**

Undergraduates	7,962
Graduates	1,537

*Nurturing practical engineers  
who learn from society and contribute  
to society*

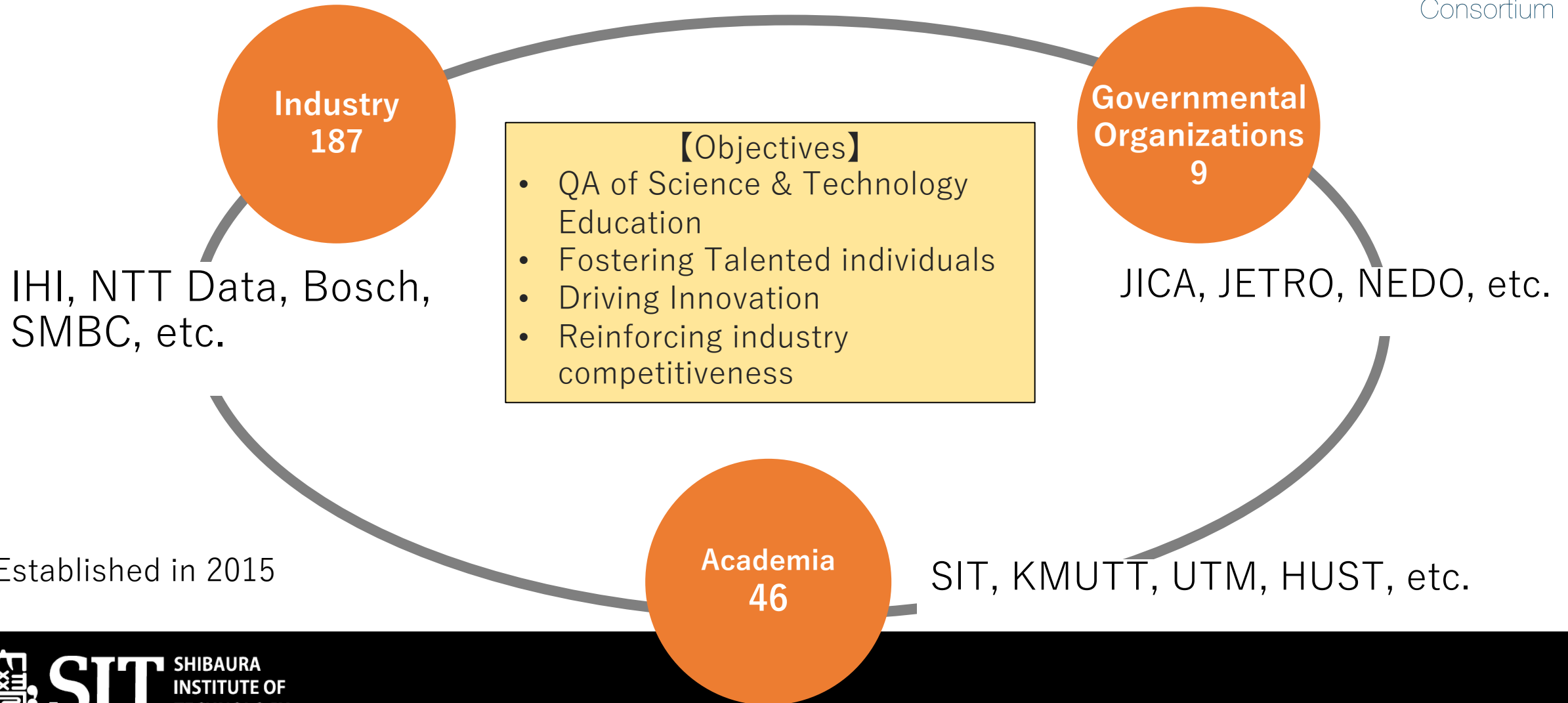
Established 1927

# Global Project Based Learning

- Enhanced student engagement
- Acquisition of real-world problem-solving abilities
- Development of cross-cultural skills
- Improved global awareness and empathy
- Increased motivation



# Global Technology Initiative (GTI) Consortium



# Global PBL with CO-WELL Co., LTD.

- Theme: PoC development of "tailgating prevention" application using Python language
- Partner Univ. : Posts and Telecommunications Institute of Technology, Vietnam
- Implemented in 2017-2019, 2022, and 2023(planned)
- Pre-training students in Vietnam
- Select top 10 students and invite them to the Global PBL
- Global PBL with SIT, Japan

**Successful in recruiting  
excellent students**



# Global PBL with Bosch Corporation

- Theme: Kaizen (Improvement)
- Partner Univ. :  
Panyapiwat Institute of Management, Thailand
- Implemented in 2019
- A group of PIM students, SIT students, and Bosch employees worked together on a kaizen project at a factory in Thailand.
- Bosch's two employees joined to the program
- They took on leadership roles

**Utilized as employee training**



# Global PBL with IHI Corporation



Japanese  
University



Indonesian  
University



Indonesian  
government agency



Industry

- Partner Univ. : Institut Teknologi Sepuluh Nopember (ITS), Indonesia
- Implemented in 2021, 2022, and 2023 (planned)

**Industry-academia-  
government collaboration**

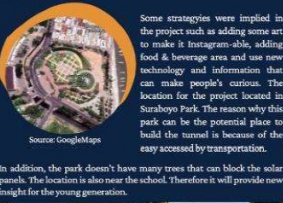
This program aims to develop, improve & evaluate these following real case study in Surabaya City:

- A. Low Carbon Society: Dependency on Grid Electricity**
- B. Smart Urban Mobility: Online Transportation System**
- C. Infrastructure & City Planning: Infrastructure for People with Disability**
- D. Disaster Prevention: Flood Threats and Water Resilience**

# Global PBL with IHI Corporation

energy and other explanation related to the renewable energy resource

### 3D Models



Some strategies were implied in the project such as adding some art to make it Instagram-able, adding food & beverage area and use new technology and information that can make people's curious. The location for the project located in Suroboyo Park. The reason why this park can be the potential place to build the tunnel is because of the easy accessed by transportation.

In addition, the park doesn't have many trees that can block the solar panels. The location is also near the school. Therefore it will provide new insights for the young generation.

**Food Court Area and Prayer Area**  
Outdoor dining concepts were applied in the project. In this way, energy use will be decreased because there's no need to use lamp or fan. Outdoor prayer area will also give different experience for the user.

**The Outside Tunnel**  
On the outside surface, the flexible solar panel will be applied. LED lights will also be placed on the surface so during the night, the lights will catch the visitors attention.

**The Inside Tunnel**  
In the tunnel, there will be digital signage that explains information related to renewable energy. Also, an additional projector will be placed to present different vibe to the visitors.

Zoom Meeting - Room 1 (A1, A2, B3, B4) | You are viewing B4 - Damara's screen | 31 Participants | 03:09:51 Remaining

## FLOOD PREVENTION AND WATER RESILIENCE

**PROBLEM**  
Rainfall in Surabaya and the climate change problems cause high volumes of water flow, causing flood problems and affecting the water quality in rivers. Besides that, limited water sources are challenges as infrastructure and governance are also the main problems in water provision.

**VISION**  
Expanding the solution that has already been applied with new techniques to achieve the demand of clean water supply in Surabaya.

**BENCHMARKING**  
In Singapore, collecting rainwater has been done using research and channel. Both Surabaya and Singapore have similar climate. In Chennai, India, collecting rainwater has been done using storage and ramps ground. Both Surabaya and Chennai have similar economic and infrastructure capacity.

**UNIQUE VALUE PROPOSITION**  
Increased the water quality and quantity and at the same time, helped in reducing flood potential in Surabaya due to the high volumes of water flow.

**AFFECTED STAKEHOLDERS**  
The people in the community  
The government  
Parum Jasa Tirta 1  
Water Company "Suryo Sembodo"

**EXISTING ALTERNATIVES**  
Collecting rainwater  
Rainwater harvesting using reservoir and basin

**SOLUTION ALTERNATIVES**  
Rainwater harvesting or collecting rainwater through rooftop catchments, using Recharge pit/Recharge trench

**POLICY OR HIGH-LEVEL CONCEPTS**  
Policy for government and commercial building to install rain harvesting technologies in their rooftop  
Partnership with in federal-level government and city agencies involved in water management.

**KEY SUCCESS FACTORS**  
Considering feasibility study to make the rainwater harvesting giving benefits for Surabaya government and civilization.  
Maintenance of the rain harvesting system to assure it still reliable.

**COST STRUCTURE**  
The cost for installing rain harvesting system is 300 to approximately 400-1000 US dollar, depends on how large is the harvesting area.

**REVENUE OR BENEFIT STRUCTURE**  
Using renewable energy (rainwater) can cut the cost!  
Implement water bill  
With the policy for government and commercial buildings to install rain harvesting, the residents that take advantage of the policy will get reduced water bill.

**IMPLEMENTATION STRATEGY**  
Research for the potential place in Surabaya to build rainwater harvesting sites.  
Collaborate with governmental sector to help on developing system in terms construction and financial perspective  
Make a socialization about the regulations and make a supervisor team that can monitor if the regulations to install the rainwater system is already applied in the certain of time.

Zoom Meeting - Room 2 (C3, C5, D1, D5) | You are viewing C3 - Aulia Nurrahma's screen | 12 Participants | 01:31:54 Remaining

## Suroboyo Bus 2.0

Suroboyo Bus is public transportation created for recreational purposes resulting in low passenger for daily commute. Recently the city government intended to make Suroboyo Bus as the main mass public transportation because plans for the new mass transit have not been realized yet. Unfortunately, the facilities to achieve this are insufficient such as few proper bus stops, and no convenient payment system. Furthermore, the application is not convenient to use for routing, scheduling, and lane notification. Suroboyo Bus 2.0 will help address these problems.

**UNIQUE VALUE PROPOSITION**  
Making Surabaya to be Smart City and Smart Mobility  
Providing the efficient and convenient public transportation

**AFFECTED STAKEHOLDERS**  
Surabaya's citizen  
City council of public transportation  
Private company that provide a money  
Suroboyo Bus 2.0 (Public Service Agency)

**IDENTIFIED CHALLENGES**  
Applications UI and CX not good enough  
Passengers don't want to use a mobility bus stop  
Not every passengers have phone or application  
Check bus schedule  
Payment method takes time and manually done

**SOLUTION ALTERNATIVES**  
Optimizing feature on website facilities  
Optimizing feature on offline facilities

**KEY SUCCESS FACTORS**  
Accessibility  
Convenience  
Connectivity

**IMPLEMENTATION STRATEGY**  
Change start from the offline aspect of the transportation system and continuing to the online aspect.

**Online Solution**  
Bus Stop  
UI  
Build a Design  
UI is not user-friendly and not easy to use  
Schedule is not easy accessible

**Offline Solution**  
Bus Stop  
Current Situation  
Signage  
Not comfortable while waiting  
Insufficient information

**Implementation**  
Build a Suroboyo Bus stop that benefit and comfortable for passengers  
Introduce a QR display in major Bus stop  
Introduce a QR display in major Bus stop  
Introduce a QR display in major Bus stop  
Introduce a QR display in major Bus stop  
Introduce a QR display in major Bus stop

Zoom Meeting - Room 1 (A1, A2, B3, B4) | You are viewing B4 - Damara's screen | 32 Participants | 01:31:26 Remaining

## PROJECT TITLE: Go-Way: An Inclusive and Universal Pedestrian Road

### CASE STUDY: Infrastructure for People With Disability

GROUP: C5

**PROBLEM**  
There is a big problem in Surabaya, Indonesia, which is the existence of an inclusive and universal pedestrian road. The problem is that the existing pedestrian road is not inclusive and universal for people with disabilities. The problem is that the existing pedestrian road is not inclusive and universal for people with disabilities.

**VISION**  
Make sure the accessibility of urban infrastructure can reach all of Surabaya's citizens and be inclusive and universal for people with disabilities. The vision is to make the urban infrastructure inclusive and universal for people with disabilities.

**BENCHMARKING**  
Singapore  
Shanghai  
London  
New York  
Tokyo

**UNIQUE VALUE PROPOSITION**  
Inclusive and universal pedestrian road  
Accessibility for people with disabilities  
Universal design

**AFFECTED STAKEHOLDERS**  
Government of Surabaya  
Citizens of Surabaya  
People with disabilities

**EXISTING ALTERNATIVES**  
Ramp  
Tactile paving  
Braille

**SOLUTION ALTERNATIVES**  
Ramp  
Tactile paving  
Braille

**IDENTIFIED CHALLENGES**  
Lack of budget  
Lack of awareness  
Lack of data

**KEY ACTIVITIES REQUIRED**  
Research and development  
Design and construction  
Implementation and evaluation

**POLICY OR HIGH-LEVEL CONCEPTS**  
Inclusive and universal design  
Accessibility

**COST STRUCTURE**  
The cost of the project is estimated to be around 100 million Rupiah.

**REVENUE OR BENEFIT STRUCTURE**  
The project will generate revenue through the sale of tickets and the use of the facility.

**IMPLEMENTATION STRATEGY**  
The project will be implemented in three phases: research and development, design and construction, and implementation and evaluation.

**KEY SUCCESS FACTORS**  
High awareness of people with disabilities  
Government support  
Community support

**ADDITIONAL INFORMATION - Problem Selection Process/ Connectivity between Problems (optional)**  
For the problem selection process, at first, we have obtained three places initially using Google Maps: Pelabuhan surrounding Dr. Soetomo Hospital, Neighborhood in Darmo Region, and DutaWardaya Project's facility in Bungkul Park. Then we analyzed which one the most appropriate is once we needed to make the boundary of our project so the solution will be well determined. Based on the SWOT analysis we used, we have chosen the Pelabuhan surrounding Dr. Soetomo Hospital by considering the site condition, the size of the pedestrian road, as it directly benefits the existence of the economic and other infrastructures that are already available in that place. For further information, it has been detailed written in our PowerPoint file.

**LESSON LEARNED FROM THIS GPBL**  
Instead of analyzing our benchmark skills, we have learned more of problems that we have figured out during the problem and study area selection process. We recognized that more places in Surabaya are needed to be developed in their existing infrastructures to people with disabilities that comfortable using the service facilities. It makes our eyes widely open and forces our brains to create innovative solutions as a contribution.

Zoom Meeting - Room 1 (A1, A2, B3, B4) | You are viewing B4 - Damara's screen | 12 Participants | 02:31:26 Remaining



# Global Project Based Learning



**Industry-academia-government collaborative  
Global PBL can meet various needs for human  
resource development toward innovative and  
sustainable growth**

*Thank you for listening!*