

# Overall Program Structure

Toru Ishida

Department of Social Informatics  
Kyoto University

# Definition of Design

---

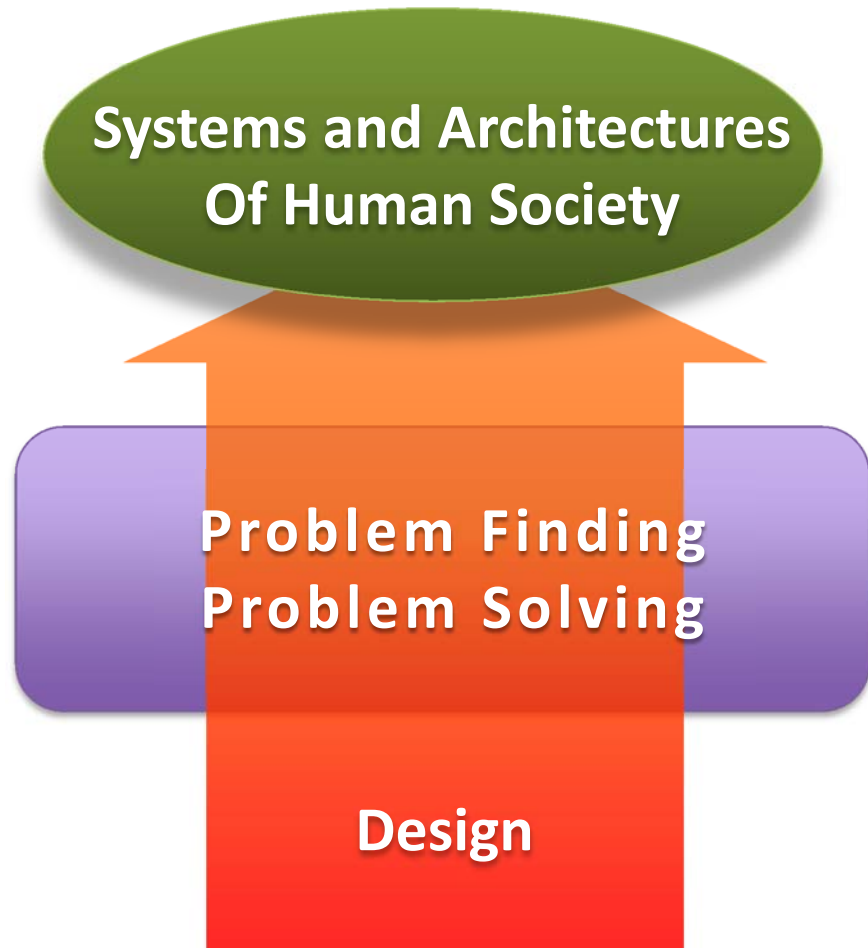
- (noun) to create a specification of an object, manifested by an agent, intended to accomplish **goals**, in a particular **environment**, using a set of primitive **components**, satisfying a set of **requirements**, subject to **constraints**
- (verb, transitive) to create a design, in an environment (where the designer operates)

Ralph, P. and Wand, Y. (2009). A proposal for a formal definition of the design concept. Design Requirements Workshop (LNBIP 14), pp. 103-136. Springer-Verlag.

**This definition is abstract enough to be interpreted differently in different research fields.**  
**For computer scientists,**  
***design problems* seems a variation of *constraint optimization problems*.**

# Definition of Design

---



**When designing systems and architectures of human society, we cannot simply apply constraint optimization algorithms.**

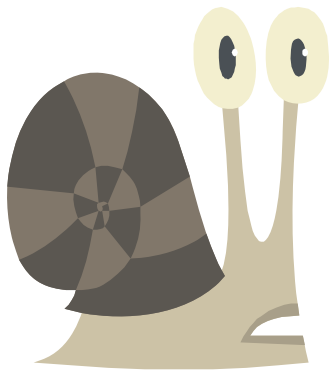
**To know requirements or constraints, we may need to organize a workshop with different stakeholders.**

# Why Interdisciplinary Program

---

## What's "PROBLEM"

- *Problem* is created by humans when they model the world.
- Different disciplines provides different models, i.e. different problem spaces.
- Transforming one problem space to another can create a different understanding of the world.

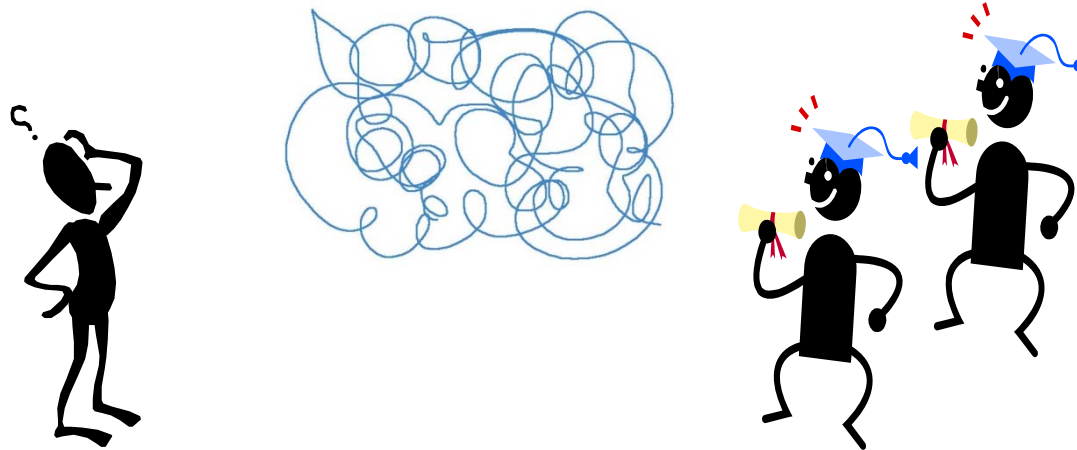


# Why Interdisciplinary Program

---

## What's "DESIGN"

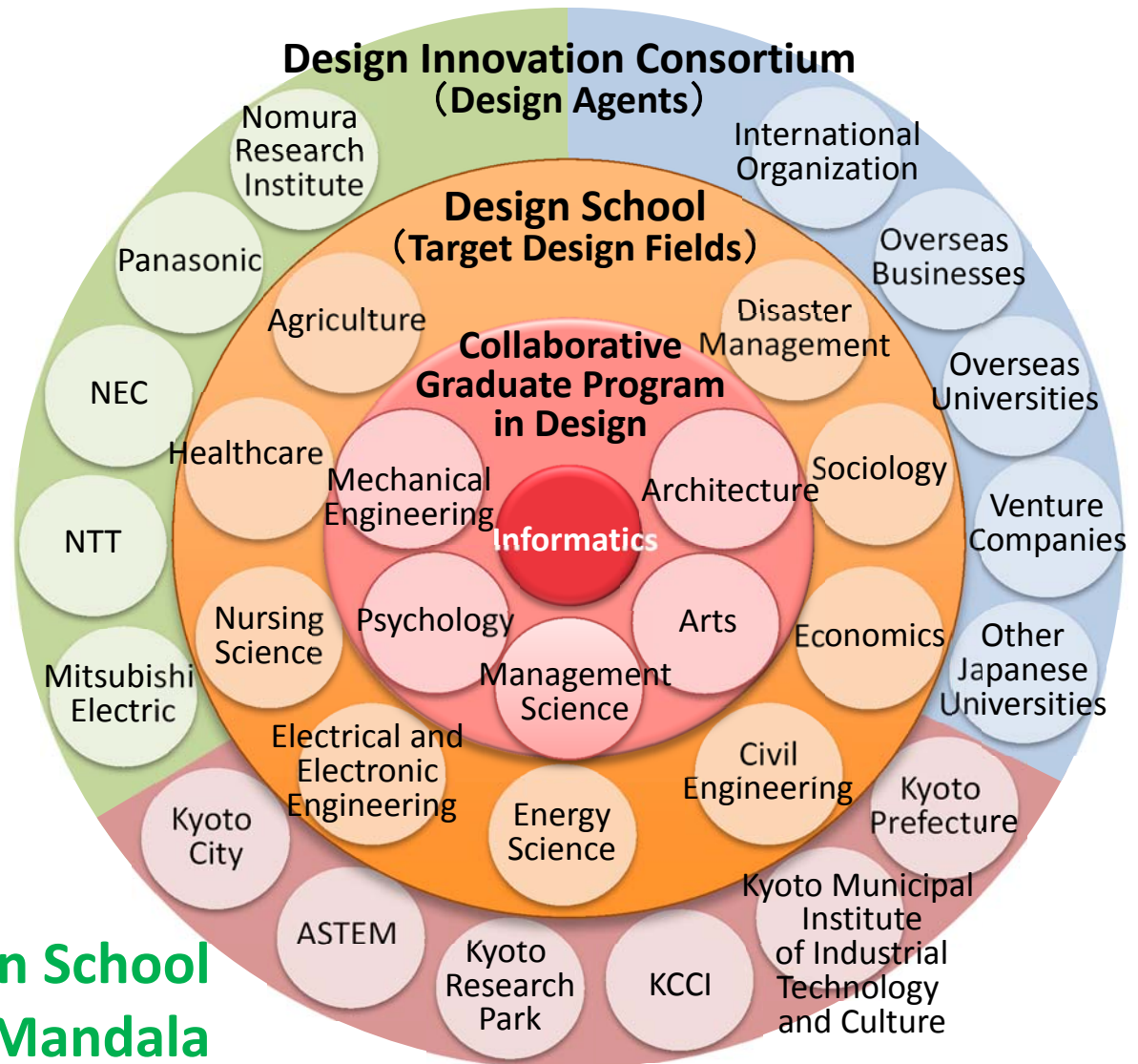
- *Design* is a process of creating/searching/learning in problem spaces.
- Increase the speed of creating/searching/learning can accelerate innovation. (e.g. rapid prototyping)
- Knowing other disciplines or collaboration with other disciplines leads us to find a better design.



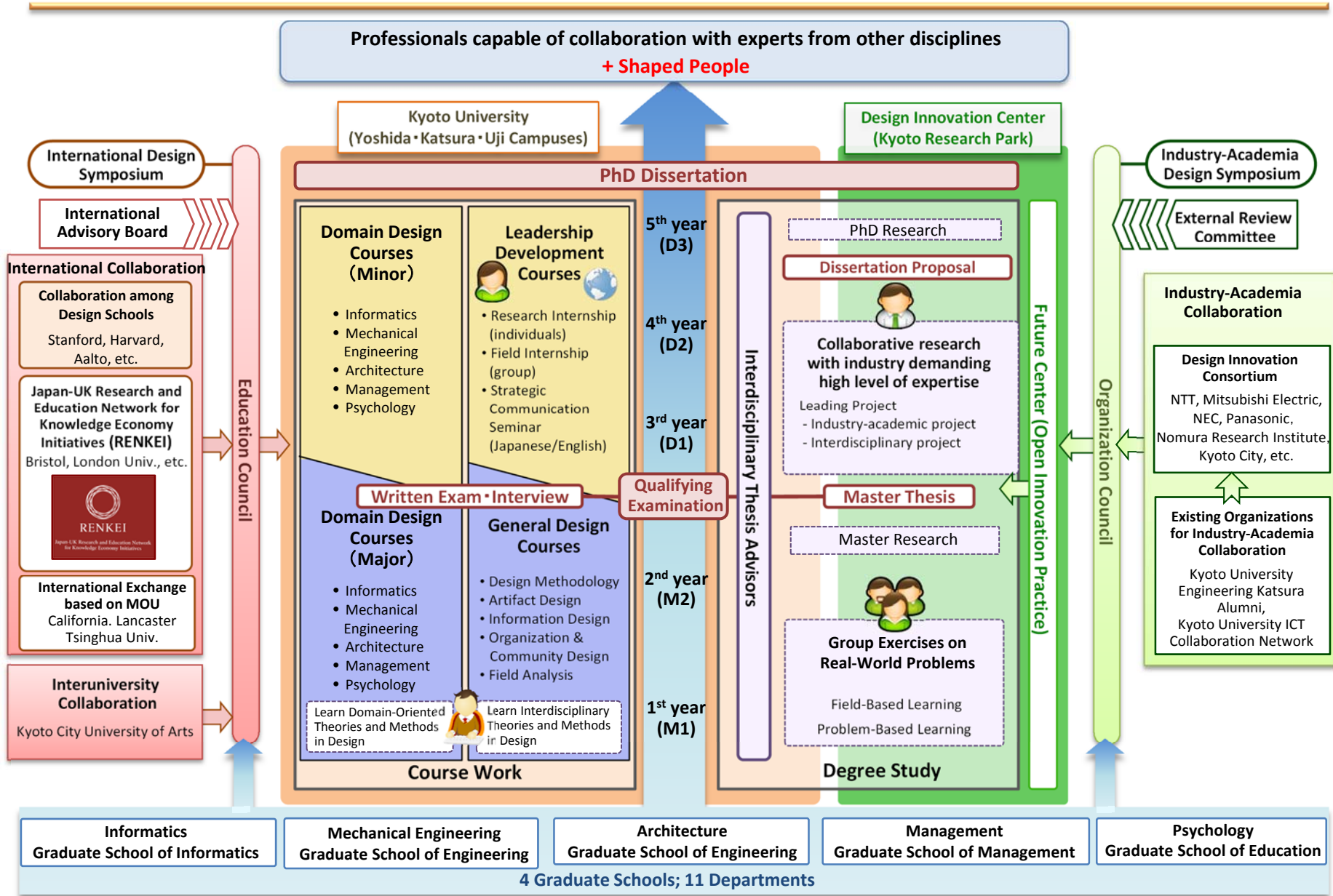
# Collaborative Graduate Program in **Design**

- Teach **Design** as a **common language** among different specialties so that they can create a professional team to solve real complex problems .

## Design School Mandala

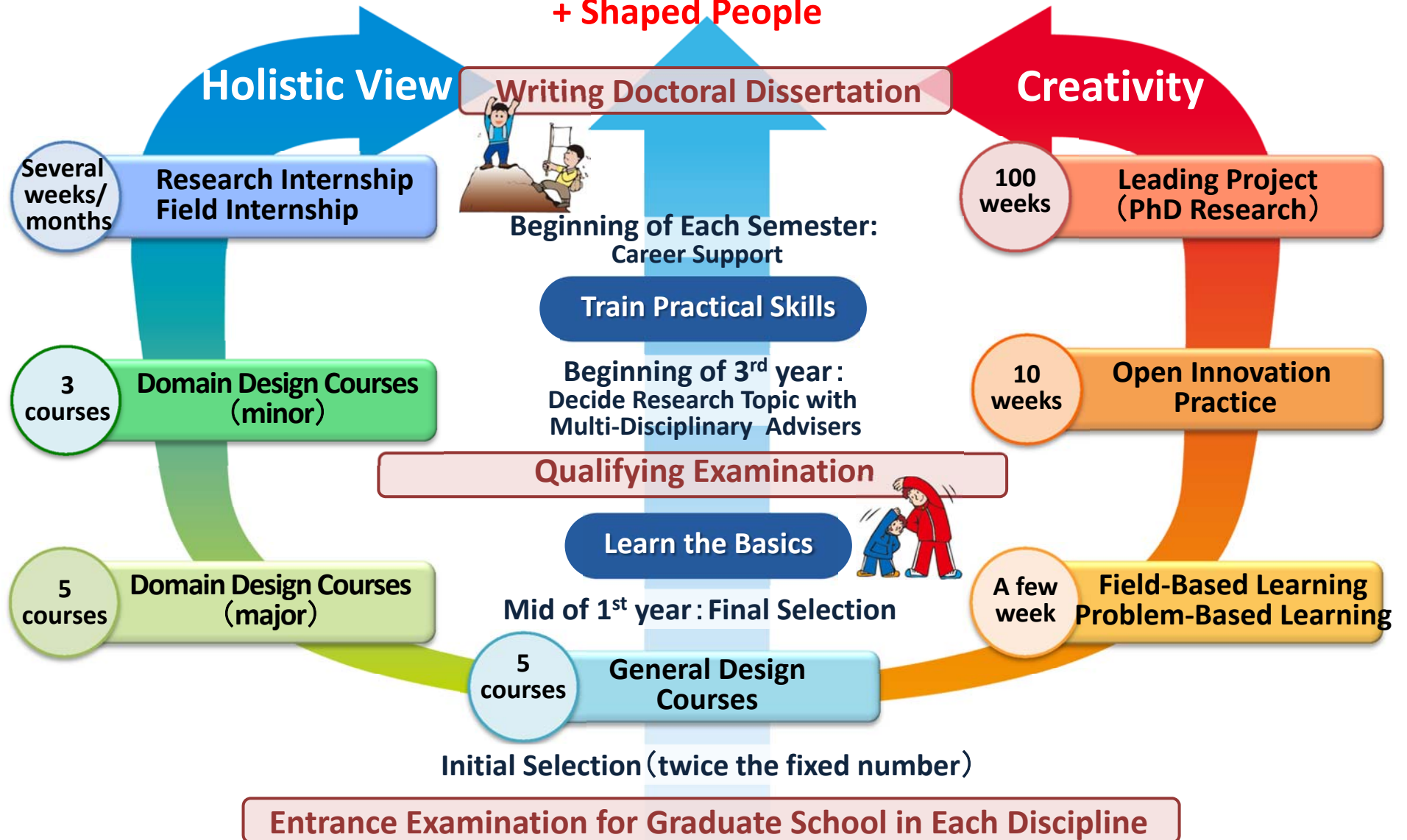


# Curriculum



# Curriculum

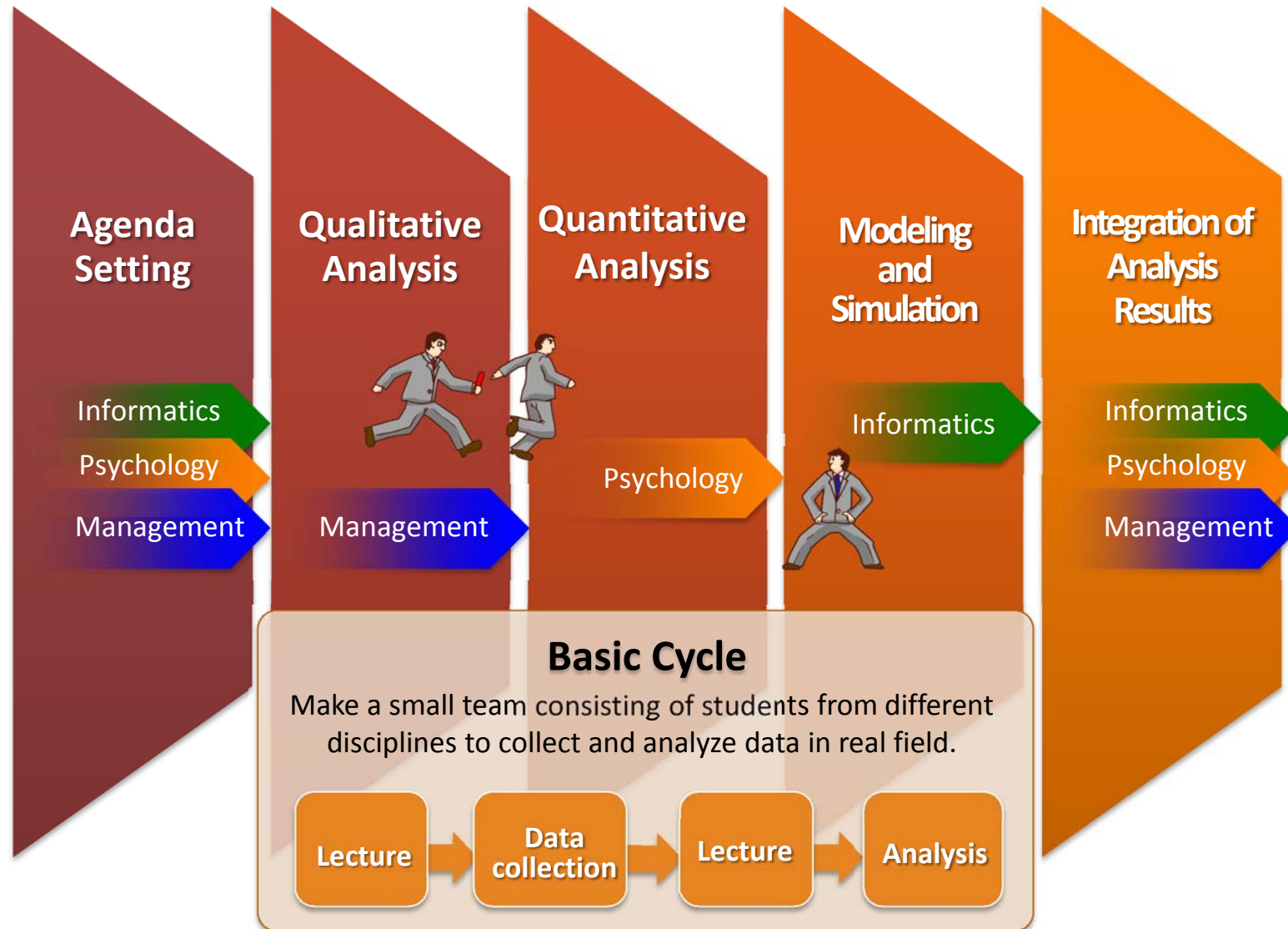
Professional Leaders with a Collaborative Skill Set  
+ Shaped People





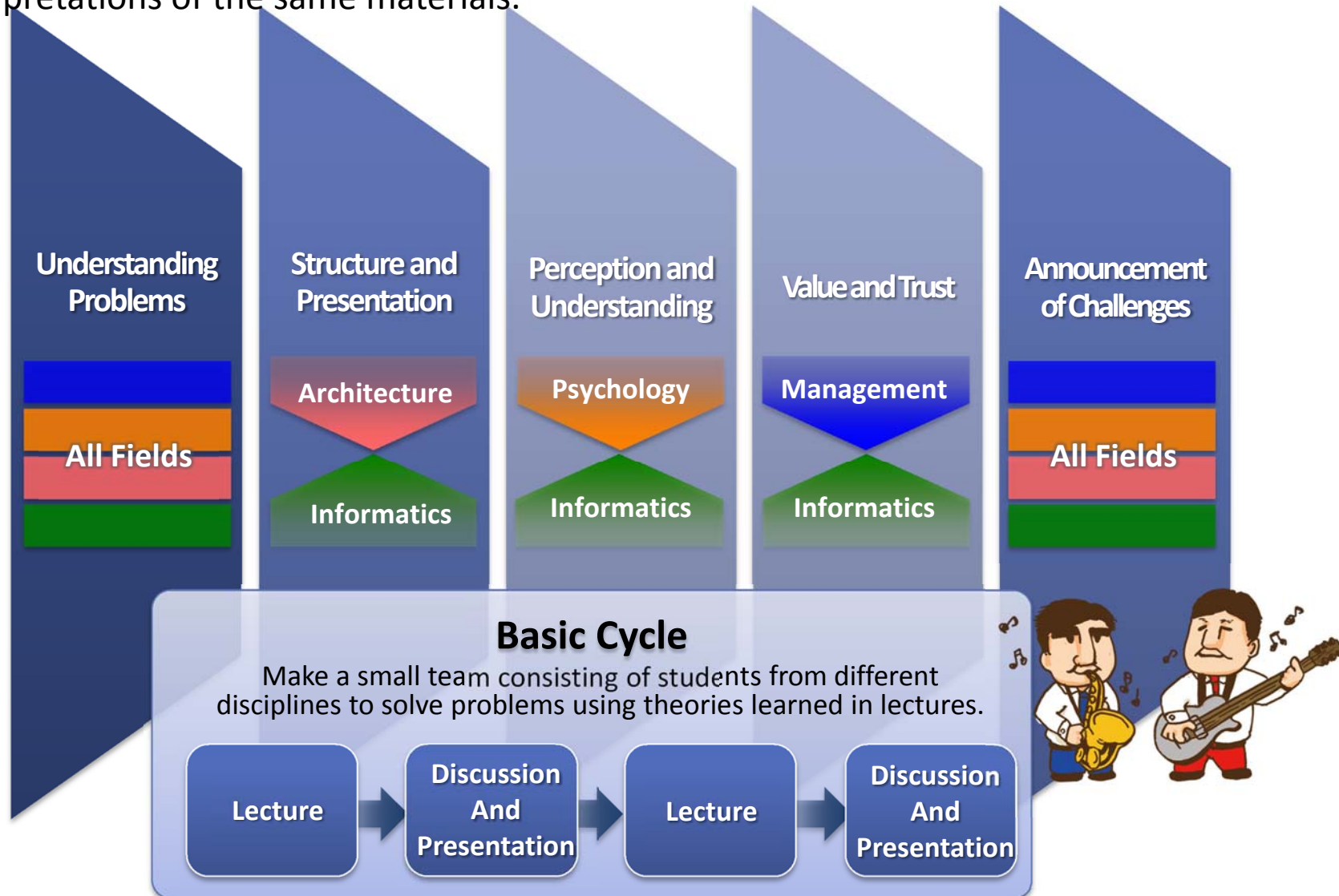
# Cross Disciplinary Lecture (Example : Methods for Field Analysis)

Organize inter-disciplinary lectures through cooperation between different fields.

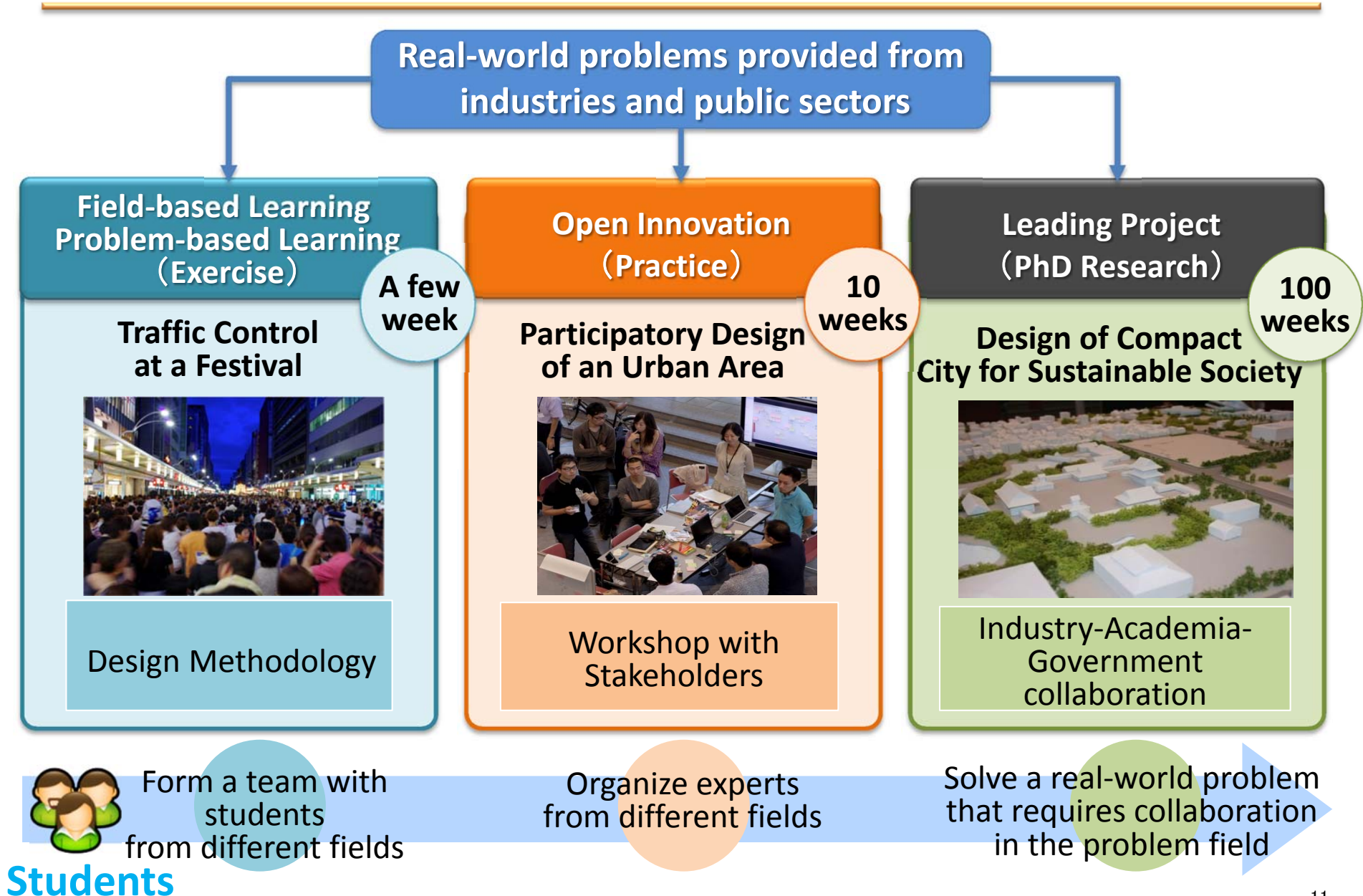


# Collaborative Lecture (Example: Information design)

Faculty members from different fields collaboratively give a talk, offering different interpretations of the same materials.



# Real Problem Line-up



# Summer **Design** School (PBL/FBL)

---



# Questionnaire

Could the school live up to your expectations?

**Beyond expectation: 60.7%**

As expected: 28.6% Poor: 10.7%

How was the length (2 days workshop + 1 day presentation) of the school?

Long: 0.0% Adequate: 69.2% **Short: 30.8%**

Did you contribute to the project with your expertise?

Much enough: 25.5% Somewhat: 48.2%

**Not at all: 26.8%**

Did you learn design theories and methods in practice?

Yes: 60.7% **Not so much: 37.5%**

Not at all: 1.8%

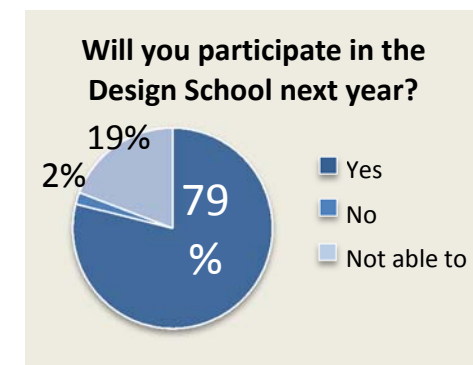
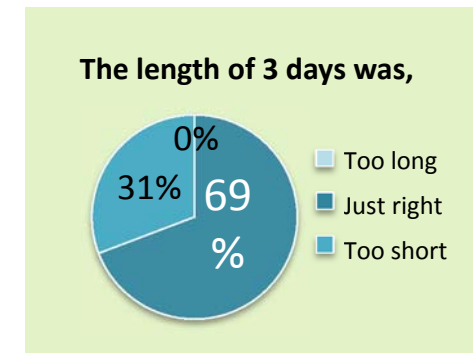
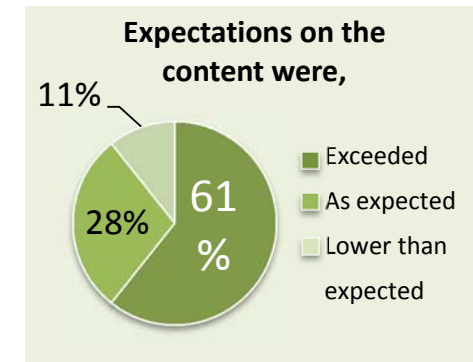
Did you join the group work actively?

**Much enough: 85.7%** Not so much: 12.5%

Not at all: 1.8%

Do you want to participate in the next Summer Design School?

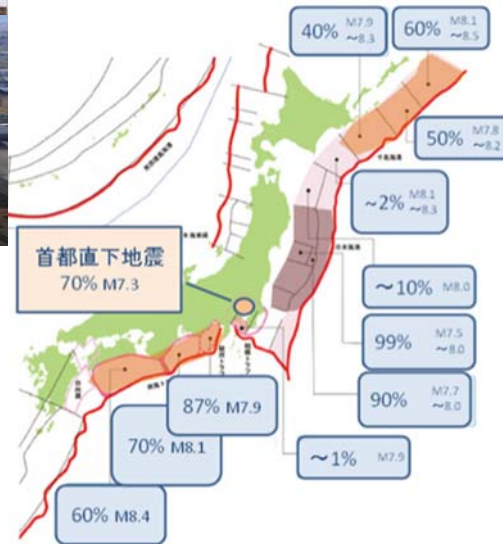
**Yes: 78.8%** No: 1.9% I cannot participate: 19.2%



# Design of a Disaster-Resilient Society



Urgent need to train experts due to expected damage caused by earthquakes in eastern and southeastern Japan, which will exceed the damage caused by Great East Japan earthquake.



## Project

We live in the Japanese archipelago where the numerous tectonic plate fault lines guarantee a massive earthquake disaster in the first half of the 21st century. Unfortunately, zero potential damage cannot be guaranteed. Therefore, the maintenance of "Comprehensive Disaster Prevention Capacity" including prevention and resilience power, and building a society that is able to recover from disasters is required. To establish "Comprehensive Disaster Prevention Capacity" we need to conduct risk evaluation, raise precautionary capacity, raise resilience capacity, taught by disaster prevention science and using cloud computing as an enabling technology.

## Experts to overcome natural disasters sure to happen in the first half of the 21st century

Designing a structure for continuation of operation after a disaster based on ISO 22301, and targeting, enterprises, public institutions, non-governmental organizations (NGO), regardless of the size of the organization and business conditions.

Design for sharing fundamental information, orders, regulations, and cooperative information through activity information processing, related department information channel, and organizational cooperation, based on ISO22320

# Design of urban areas for a sustainable society



Kyoto, Okazaki  
area re-design:  
Image of  
pleasurable walk  
at the Shinto  
shrine street

(Revitalization  
vision of  
Okazaki  
region, 2011)

Community and  
governance  
based  
landscaping:  
3D CG in a  
district in Kyoto



## Project Content

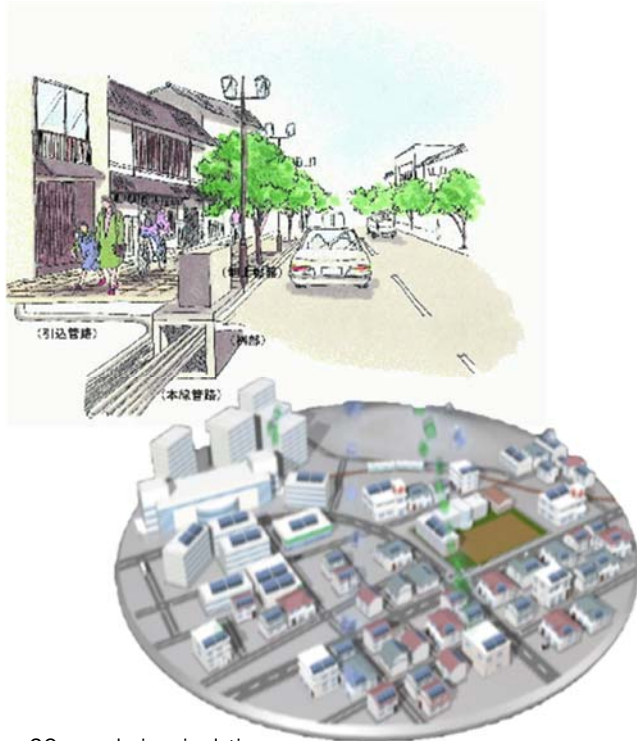
In order to foster a rich lifestyle, there is a need to expand the design of "urban areas" to include the relationship between artifacts and human-environment. "Area Design" aiming at city-level comprehensive optimization the following are considered: formation of ecological environment in harmony with the natural ecosystem, creation of beautiful landscape consisting of a network of similarities and differences, realization of smart community to optimize an area, with energy and mobility information, the creation of new services to network resources in the area, tourism Strategy MICE for an ubiquitous society, and realization of creative urban space for culture, art, science and technology. We work on various types of urban areas in the heart of the historical city of Kyoto.

Experts with interaction and expressive power capable of designing environment and scenery

In the design of urban areas for a sustainable society, various fields including natural, social, cultural, artificial, information environments should be considered. *Design for system inclusion* solves complex problems, and fosters the ability to use design elements and designing systems.

In order to enhance the meaning and value of the entire urban area, interaction with different disciplines is indispensable. Through industry-government-academia collaboration and field exercises, we develop experts with excellent interactive skills.

# Affluent Social Systems Supported by Urban Mobility



CG area design simulation

## Project

We combine the model base management in the informatics field with the primitive level human behavior models and analysis results from mechanical engineering field, and optimization of a prediction model with the feedback from the real human living environments. This will provide the infrastructure for adaptive and flexible life, and provide casual introduction to human activities (harnessing). Furthermore, by conducting macro simulations of the entire area and model the driver from the driving data an EV, we can analyze and demonstrate the use of emergent properties of consumers, and temporal and spatial data, in geography and architectural science. By linking management studies, we design social norms for the realization of a learning community that clarifies the relationship to low-carbon economy, in order to mediate Green Living.

## Experts for comprehensive management for designing complex living spaces

We pursue the global optimal solution through trial and error innovation based on directly observing from a human perspective what people want in their daily lives, and what they need with a collaborative interdisciplinary approach, and cultivate creative abilities.

Because it is a complex issue, it is important to communicate closely with the people who are the target of the design at each stage of the analysis, planning, and practice. Students are required to acquire a high ability to communicate with people in general.

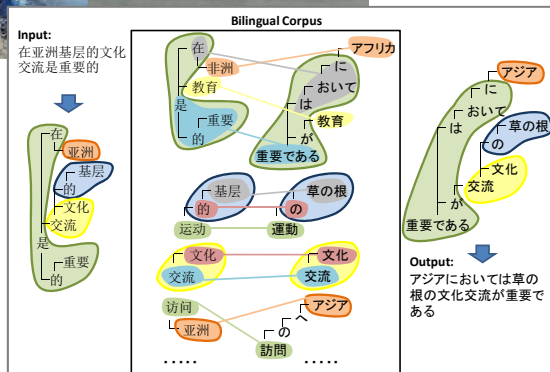


# Visualization of Multilingual Discussion Networks



Continuing tensions in Asia

High-precision automatic translation using parallel corpora



## Project

In recent years globalization has increased tensions between peoples and nations. Language barriers make it difficult to communicate on complex subjects. Breaking down these walls is becoming possible through high-precision automatic translation using large-scale parallel text. Gradually increasing precision is possible through volunteer translators, the accumulation of parallel text, and manually correcting translation results. Additionally it is now possible to extract complex relations from web-scale multilingual data, on cause-and-effect and dependency relations. We aim to create a translation environment, that will improve cross-cultural communication.

## Expert Training on International and Intercultural Collaboration based on Cutting-edge IT

In co-operation with Chinese and Korean businesses, we plan to design a internet-based crowd-sourcing system. By using team members from different cultural backgrounds, participating students will learn to communicate across cultural differences and co-operate to solve problems.

This project concerns natural language processing and service science from an informatics, business and psychological perspective. We as an institution can contribute the skills required for designing the systems required for co-operation between complex industries.

# Cultural Services: Learn from Traditional Japanese Food



Examples  
(Ryozanpaku  
Kyoto):  
Harmonized in terms  
of taste, texture,  
ingredients, cooking  
method, and color.  
Each dish is a thick  
with multilayered  
stories and an  
experience for  
tourists.

Analyze design  
methods through  
discussions with a  
cook. (left Mr.  
Hiroshi  
Yamaguchi,  
Kyoto Kitano  
hotel chef).



## Project Content

Focus on services, such as restaurant food with international competitiveness, to clarify the methods and logic of its design, and provide a model for a new general management theory. Design for "personality" is to rather than aiming for just delicious, make a change in a combination of ingredients with a sense of distance, leading to a surprise with new texture and taste. It is necessary to establish a uniform theory for services rooted in these cultural contexts. This business does not aim primarily to maximize profit, but at consistent quality of service, and attracting tourists, professionals, skilled chefs. In addition, in these type of services, mutual understanding with customers to offer a good experience, and high level of surprise is a preamble. However, coexistence with information technology has become a challenge in recent years.

## Experts who can understand the design and practice rooted in the culture

Developing experts capable of designing business models and businesses. In the international market, it is required to have design ability aimed towards connecting cultural values to business.

Experts are required to be able to work in various fields, and also be able to build a theory and methodology for achieving a design that is rooted in the cultural context.

# Discussions on Curriculum

---

## General Design Courses

- Design Methodology
- Artifact Design
- Information Design
- Organization & Community Design
- Field Analysis

## Degree Study

- Field-Based Learning
- Problem-Based Learning
- Open Innovation Practice
- Leading Project

## Domain Design Courses

- Informatics
- Mechanical Engineering
- Architecture
- Management
- Psychology

## Leadership Development Courses

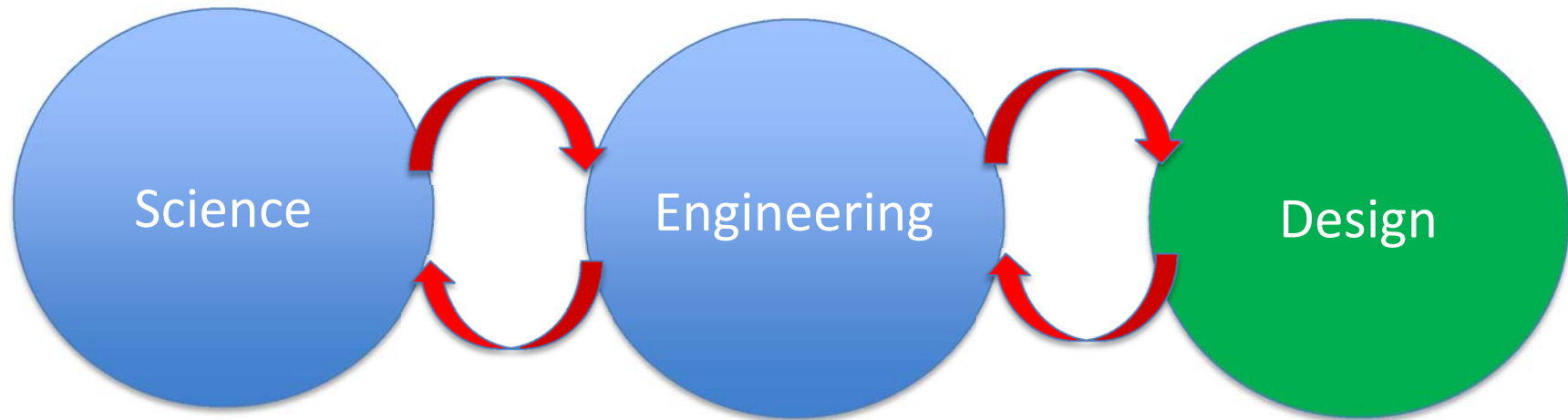
- Research Internship (individual)
- Field Internship (group)
- Strategic Communication Seminar

Any other ideas?

# Our Goal

---

Academia



Society