

Title	Introduction to ALPS
Sub Title	
Author	
Publisher	慶應義塾大学大学院システムデザイン・マネジメント研究科
Publication year	2011
Jtitle	Active learning project sequence report Vol.2011, (2011.) ,p.1- 20
JaLC DOI	
Abstract	
Notes	
Genre	Research Paper
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO40002003-00002011-0001

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1. Introduction to ALPS

ALPS (Active Learning Project Sequence)

The Graduate School of System Design and Management
Keio University



Keio SDM



1

Purpose of ALPS: Education of Innovation

Methods to educate Innovation:

- Team-oriented creation of ideas
- Design from the viewpoint of users
- Systematic approach from the idea creation phase
- Idea sharing and proposal using “prototyping rapidly”
- Development of effective communication to express ideas
- Lectures and student presentations in English



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Lecturers of ALPS

Lecturers from following universities:

MIT
Stanford University
Delft University of Technology
Keio University



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Lecturers in the 2010 academic year

© MIT

Associate Professor Olivier de Weck

- Strategic Engineering Research Group at the Dept. of Aeronautics and Astronautics and Engineering Systems Division, MIT



Mr. Takuto Ishimatsu

- Ph.D. student at MIT



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Lecturers in the 2010 academic year

© Stanford University

Dr. Kurt Beiter

- Acting Associate Professor,
Department of Mechanical Engineering,
Stanford University



Dr. Whit Fowler

- fresh Ph.D. from Stanford University



© Delft University of Technology (the Netherlands) Professor Gerard Dijkema



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Lecturers in the 2010 academic year

© Keio University

Assistant Professor Sun K. Kim

- Ph.D. from Stanford University in 2009

Associate Professor Tetsuya Toma

- Professional of project management

Prof. Shinichiro Haruyama

- coordinator of ALPS

Assoc. Professor Naohiko Kohtake

Assoc. Professor Nobuaki Minato

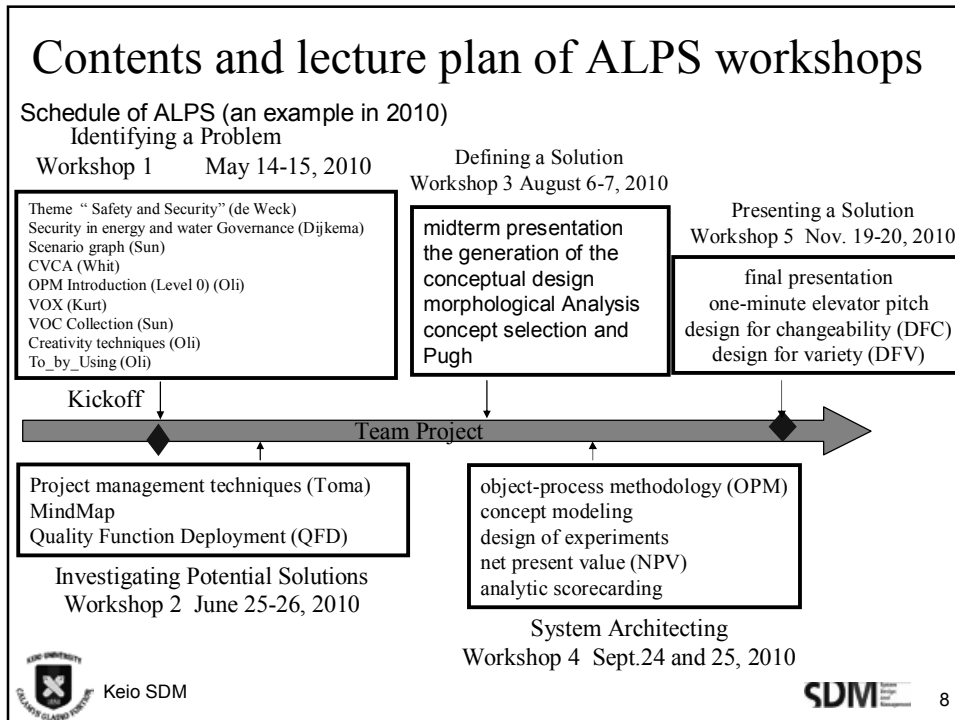
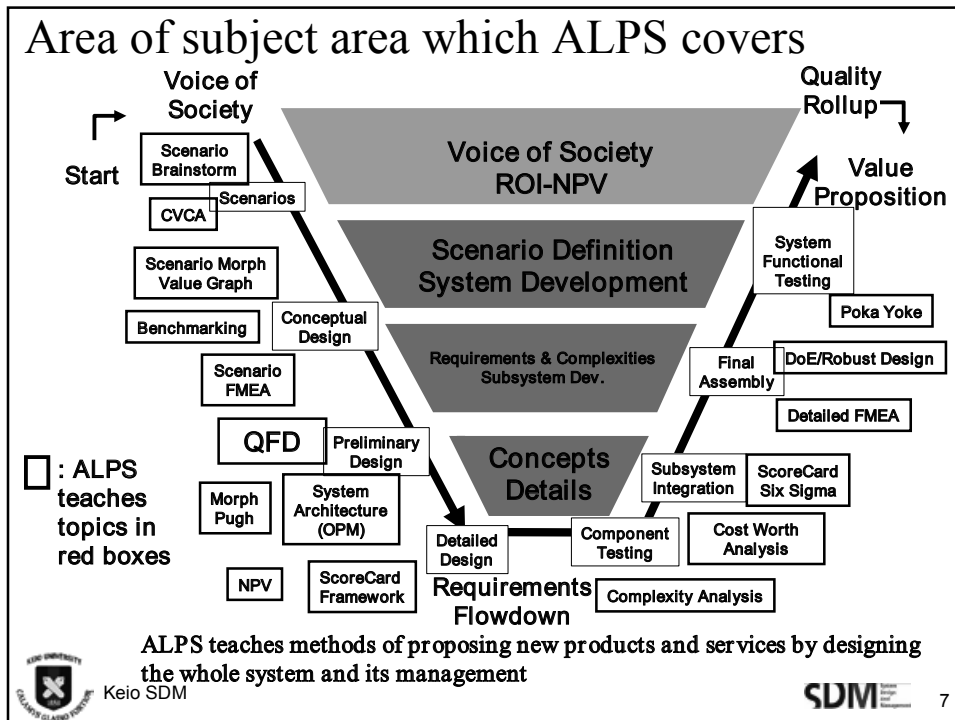
and All other SDM faculty members



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Scenes from ALPS workshops



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ALPS lectures



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Scenes from ALPS workshops



Students listening to lectures



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Lectures from abroad



Video lecture from MIT

Lecturers occasionally give lectures using video conference system.



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Theme of ALPS project

- Theme of 2008 ALPS
 - Enhancing senior life
- Theme of 2009 ALPS
 - Sustainable Community
- Theme of 2010 ALPS
 - Safety and Security



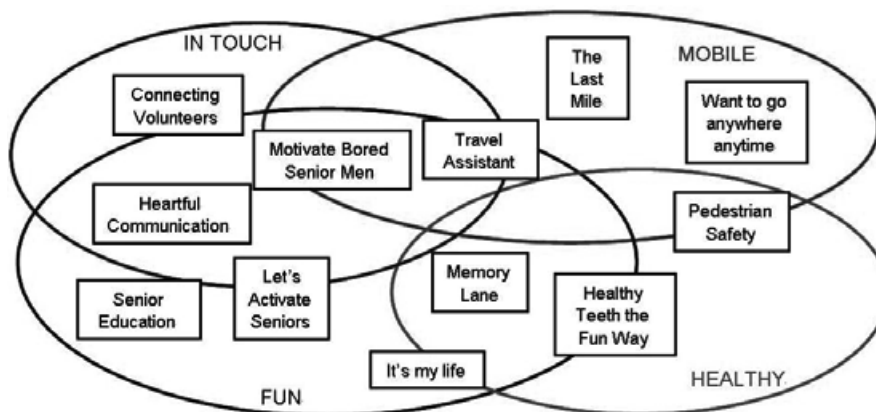
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SDM 12

- Theme of 2008 ALPS
 - Enhancing senior life



Theme of 2008 ALPS: Enhancing senior life



Projects can be grouped into four types: mobile, health, human, and entertainment.



Example of prototyping rapidly by a student group in 2008



Prototype for pedestrians to warn car drivers by flashing LEDs attached to the wear.



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Presentation of ALPS group in 2008



2009年2月

Demonstration of Travel Guide Pet Robot “PILO”



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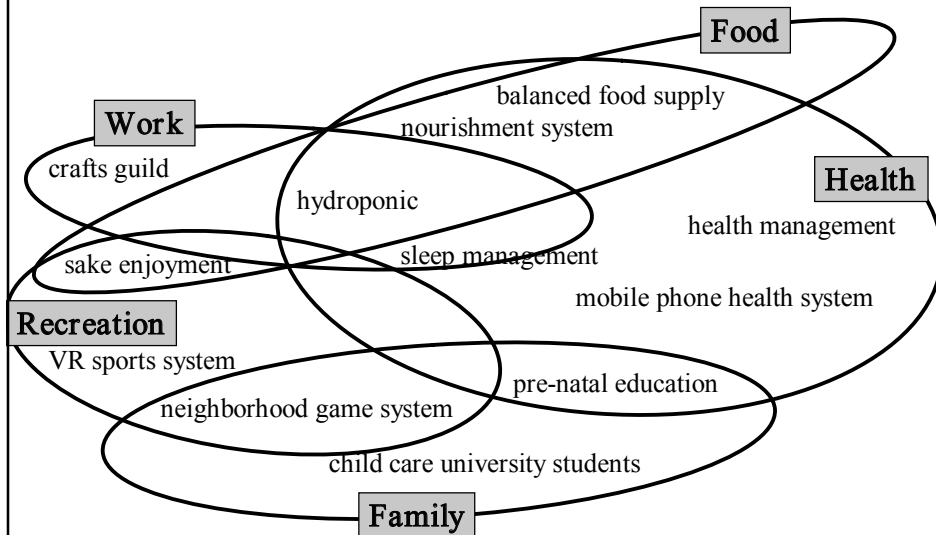


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- Theme of 2009 ALPS
 - Sustainable Community



Theme of 2009 ALPS: Sustainable Community



Projects can be grouped into four types: work, family, food, and health.



Prototype presentation of a student group in 2009



Concept prototype using Lego blocks



Presentation doing actual demonstration of sales



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One-minute elevator pitch in ALPS 2009



Example of a one-minute elevator pitch

A student sells his/her idea to a possible investor/president.



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“Kosuke Ishii Award for Excellence in System Design and Management”



Late Professor Kosuke Ishii,
Stanford University
Passed away on March 2, 2009



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This award was created in memory of Professor Kosuke Ishii, who led to the success of ALPS in 2008 academic year by encouraging students to work together as a team and propose new ideas.

This award will be given to a team who has shown excellence in proposing new ideas and developing products and services.

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A team who got Ishii Award in 2009



Roppongi Vege & Fruit Corporation
New idea: Train farmers' successors by hydroponic system
using closed-down school buildings in megalopolis Tokyo



Ishii Award Trophy



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- Theme of 2010 ALPS
– Safety and Security



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SDM 23

2010 ALPS: Students come up with creative ideas based on Company-proposed themes about safety and security

15 companies proposed themes about “Safety and Security” and 17 student groups discuss about new services or products for those themes from companies

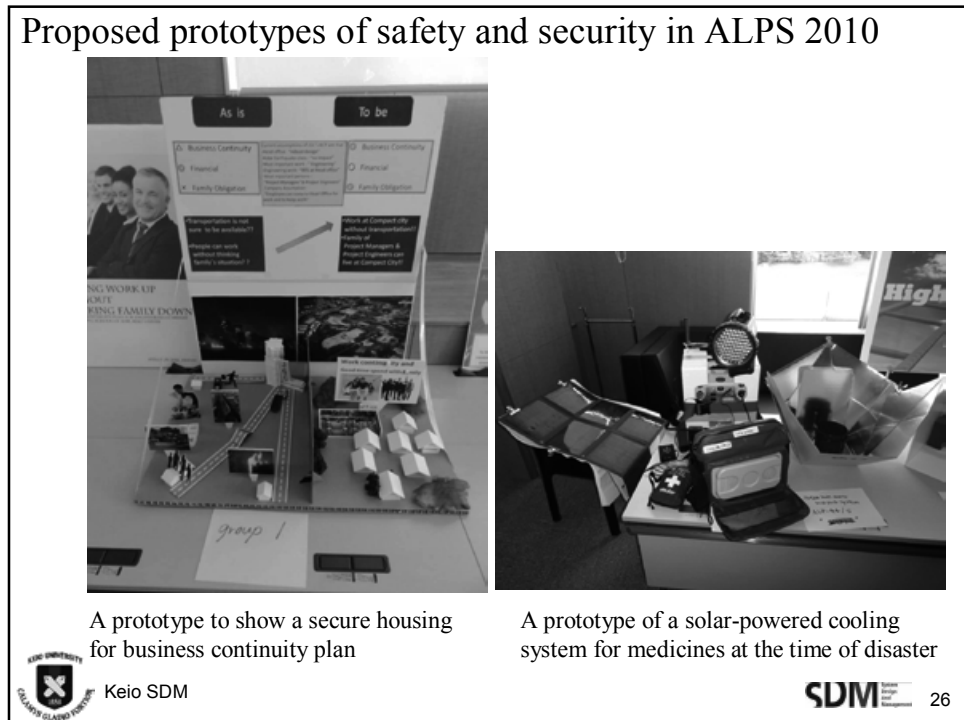
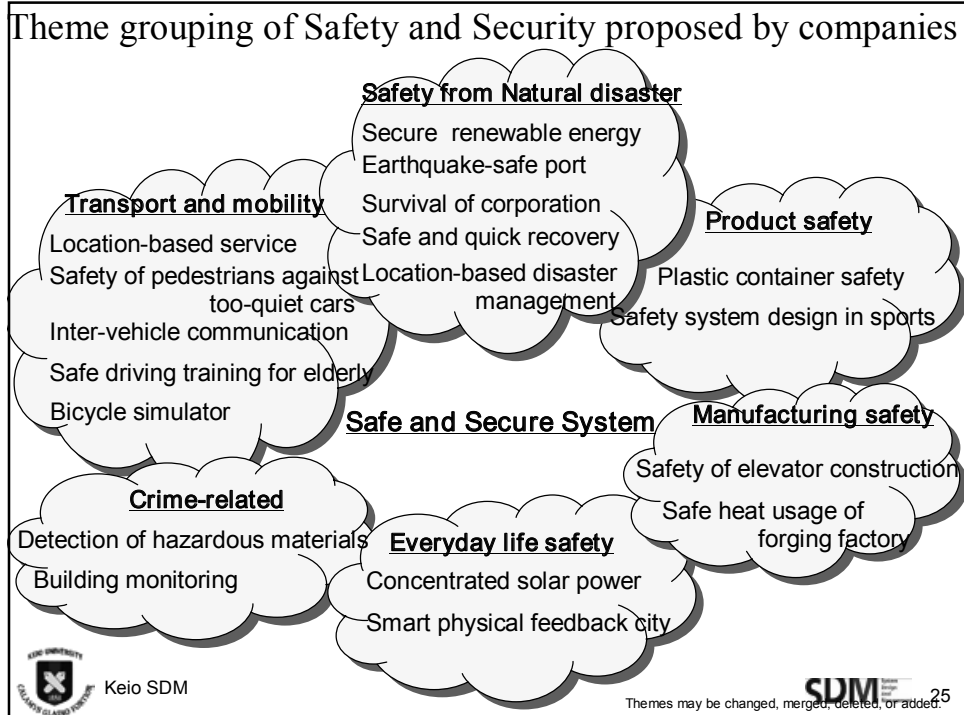
List of themes about safety and security proposed by 15 companies

Cost-effectiveness Approach for Risk Management and Business Continuity Management Company: JGC Corporation (Nikki)
 Social system design for accelerated disaster recovery Company: Tokio Marine & Nichido Risk Consulting Co. Ltd.
 Red Rescue Project Company: NTT DATA CORPORATION
 Disaster prevention system using renewable energy Company: Kokusai Kogyo group Infrastructure Innovation Institute, Inc.
 Smart Physical Feedback City Company: Toshiba Corporation with Shimizu Corporation
 Mechanism of industrial accident zero making Company: Toshiba Elevator and Building Systems Corporation
 Providing of safe plastic food containers Company: Asuka Company
 Brand image creation of safety and security Company: Adidas
 Concentrated Solar Power Company: Delft University of Technology
 Real Time Chemical Detection Company: Atonarp Inc.
 Mobility Interactive System Design & Management Company: SUZUKI Motor Corporation
 Design of Seamless Positioning Platform Company: GNSS Technologies Inc.
 System design for dissemination of Careful driving training for senior drivers Company: Tokio Marine & Nichido Risk Consulting Co. Ltd.
 BCP(Business Continuity Plan) for a Port after Earthquake Disaster Company: JFE Engineering Corporation
 Design of Bicycle Simulator to reduce the risks of traffic accidents Company: Toshiba System Technology



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One-minute elevator pitch in ALPS 2010



Example of a one-minute elevator pitch
Design of Bicycle Simulator to reduce the risks of traffic accidents
Theme was give from Toshiba System Technology



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A team who got Ishii Award in 2010



Cycle K Bicycle Simulator



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SDM 28

Theme of ALPS 2011:

“Symbiosis and Synergy” (日本語訳: 共生と共力)

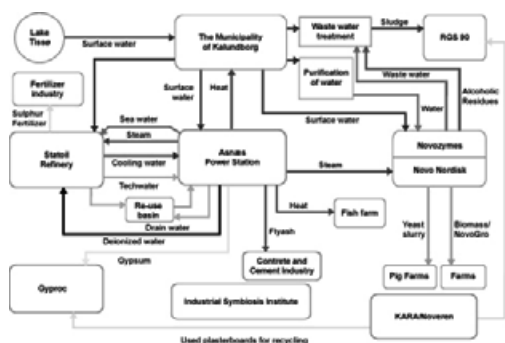
We are asking to companies for proposals of topics that are related to “symbiosis and synergy”, and we will introduce the topics in the first ALPS workshop in May, which students will start working on during the ALPS.



Example of proposals of “Symbiosis and Synergy” :

Example 1: Use of Company’s Byproducts and Waste Energy to Produce Valuable Material and Energy

A notable example of both symbiosis and synergy in industry is the Danish industrial park of Kalundborg. Here one company’s byproducts and waste energy becomes valuable material and energy for another. Various entities such as a large power plant, an oil refinery, a pharmaceutical plant, a plasterboard factory, an enzyme manufacturer, a waste company and the city itself forms an industrial eco-system.



Example of proposals of “Symbiosis and Synergy” :

Example 2: Merger of Airline Companies to Obtain Synergy Effect by Combining Non-overlapping Routes and Sharing a Hub Airport



Merger of United Airlines and Continental Airlines will produce synergetic effect by combining routes that barely overlap and by sharing a hub Houston Airport.



Example of proposals of “Symbiosis and Synergy” :

Example 3: Use of Electric Power for Home and Plug-In Electronic Vehicles

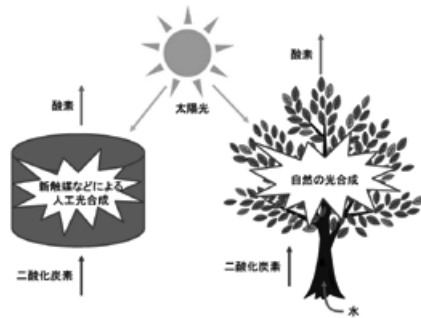


Many future homes will be using solar power such as solar cells to supply energy for home appliances. At the same time, many homes are expected to own plug-in electronic vehicles. If homes use solar power for both home appliances and plug-in electronic vehicles, they will not have to charge the vehicle batteries at public charge stations. This will reduce the burden of building a huge charge station infrastructure. Thus, if car companies and home power utility companies work together, great synergy effect will be obtained.



Example of proposals of “Symbiosis and Synergy” :

Example 4: Artificial Photosynthesis for Symbiosis of Human and Nature



Currently humans produce much more CO₂ than the limit which the Earth is able to endure. If the artificial photosynthesis technology is achieved as shown in Figure 6, both human and nature will be able to absorb CO₂ from the atmosphere, thus balancing with the CO₂ exhaust's by human activities of manufacturing, transportation, etc. This will result in a better symbiosis of human and nature.



Schedule of ALPS 2011 Workshops

- May 13 and 14 ALPS Workshop No. 1
- June 24 and 25 ALPS Workshop No. 2
- August 6 and 7 ALPS Workshop No. 3
- Sept. 30 and Oct. 1 ALPS Workshop No. 4
- November 18 and 19 ALPS Workshop No. 5



ALPS Schedule Map in V Model

Active Learning Project Sequence ALPS2011

