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ALPS (Active Learning Project Sequence)

The Graduate School of System Design and Management
Keio University



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Purpose of ALPS



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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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Learning Objectives of ALPS



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Learning Objectives of ALPS:

Students will be able to master the major steps in a product or system development project

- Identifying a need or problem to be solved
- Stakeholder and value identification
- Requirements Definition
- Generating new Ideas and Concepts
- Selecting among competing concepts
- Designing products and services for value delivery
- Understanding the element of uncertainty
- Co-designing the product/service and the supply chain
- Assemble a business case and perform financial analysis
- Effectively present the concept in both written and oral form



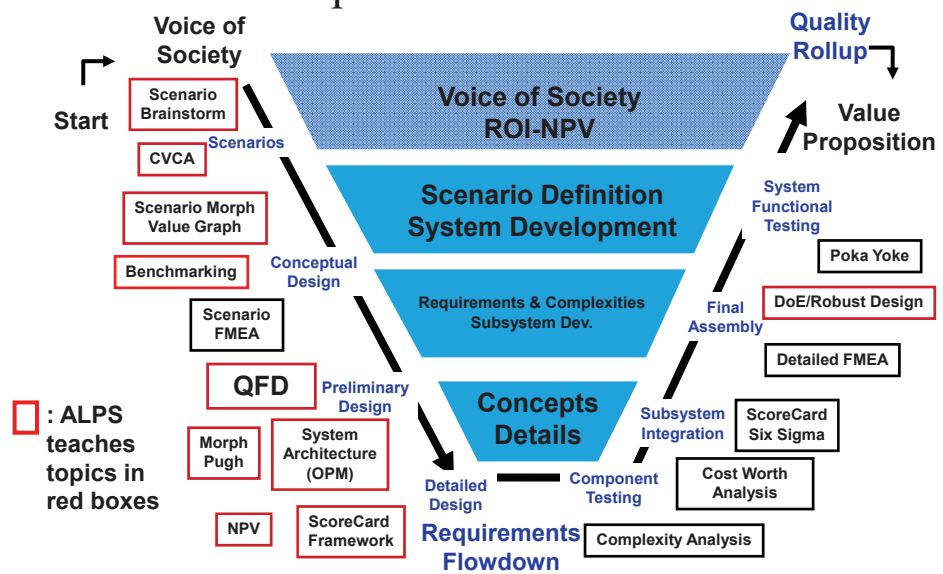
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Area of ALPS topics in V model



Area of ALPS topics in V model



ALPS teaches methods of proposing new products and services by designing the whole system and its management

Lecture plan of ALPS workshops



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Lecture plan of ALPS workshops

Schedule of ALPS (an example in 2010)

Identifying a Problem

Workshop 1 May 14-15, 2010

Theme "Safety and Security" (de Weck)
 Security in energy and water Governance (Dijkema)
 Scenario graph (Sun)
 CVCA (Whit)
 OPM Introduction (Level 0) (Oli)
 VOX (Kurt)
 VOC Collection (Sun)
 Creativity techniques (Oli)
 To_by_Using (Oli)

Defining a Solution

Workshop 3 August 6-7, 2010

midterm presentation
 the generation of the
 conceptual design
 morphological Analysis
 concept selection and
 Pugh

Presenting a Solution

Workshop 5 Nov. 19-20, 2010

final presentation
 one-minute elevator pitch
 design for changeability (DFC)
 design for variety (DFV)

Kickoff

Team Project

Project management techniques (Toma)
 MindMap
 Quality Function Deployment (QFD)

Investigating Potential Solutions

Workshop 2 June 25-26, 2010

object-process methodology (OPM)
 concept modeling
 design of experiments
 net present value (NPV)
 analytic scorecarding

System Architecting

Workshop 4 Sept. 24 and 25, 2010



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Lecturers of ALPS



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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

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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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Kosuke Ishii Award



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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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Scenes from ALPS workshops



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Scenes from ALPS workshops



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ALPS lectures

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Scenes from ALPS workshops



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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



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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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- Theme of 2008 ALPS
 - Enhancing senior life



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Theme of 2008 ALPS: Enhancing senior life



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



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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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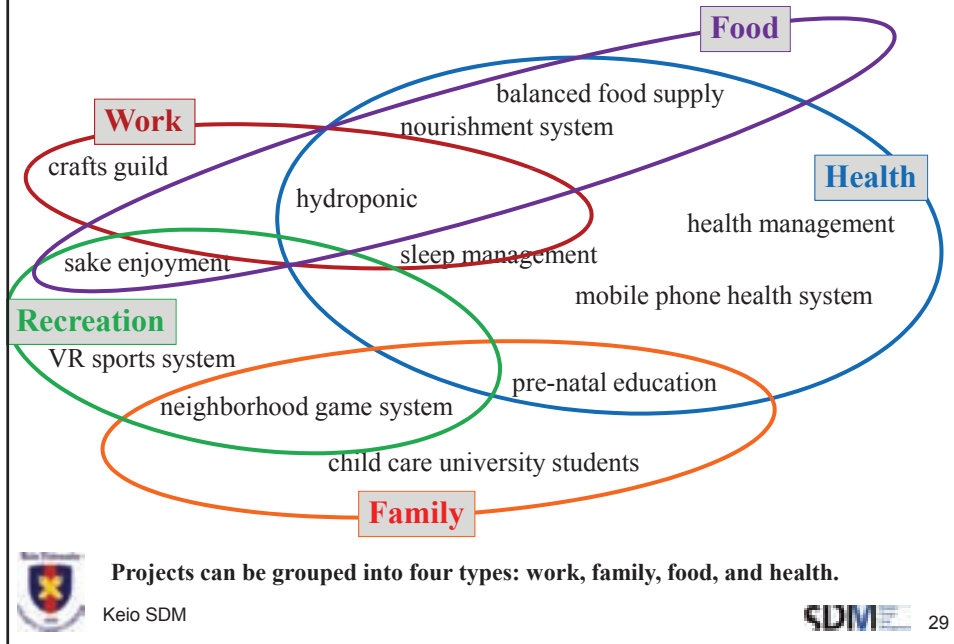
- Theme of 2009 ALPS
– Sustainable Community



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Theme of 2009 ALPS: Sustainable Community



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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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



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



Presentation of ALPS group in 2010



Demonstration of solar-powered cooling system for medicines at the time of disaster



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Proposed prototypes of safety and security in ALPS 2010



A prototype to show a secure housing for business continuity plan



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A prototype of a solar-powered cooling system for medicines at the time of disaster

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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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