EDGE Program funded by MEXT
Keio University
Global Innovator Acceleration Program
2014
COURSE WORK
Day 2

Graduate School of System Design and Management
EDGE Program Team

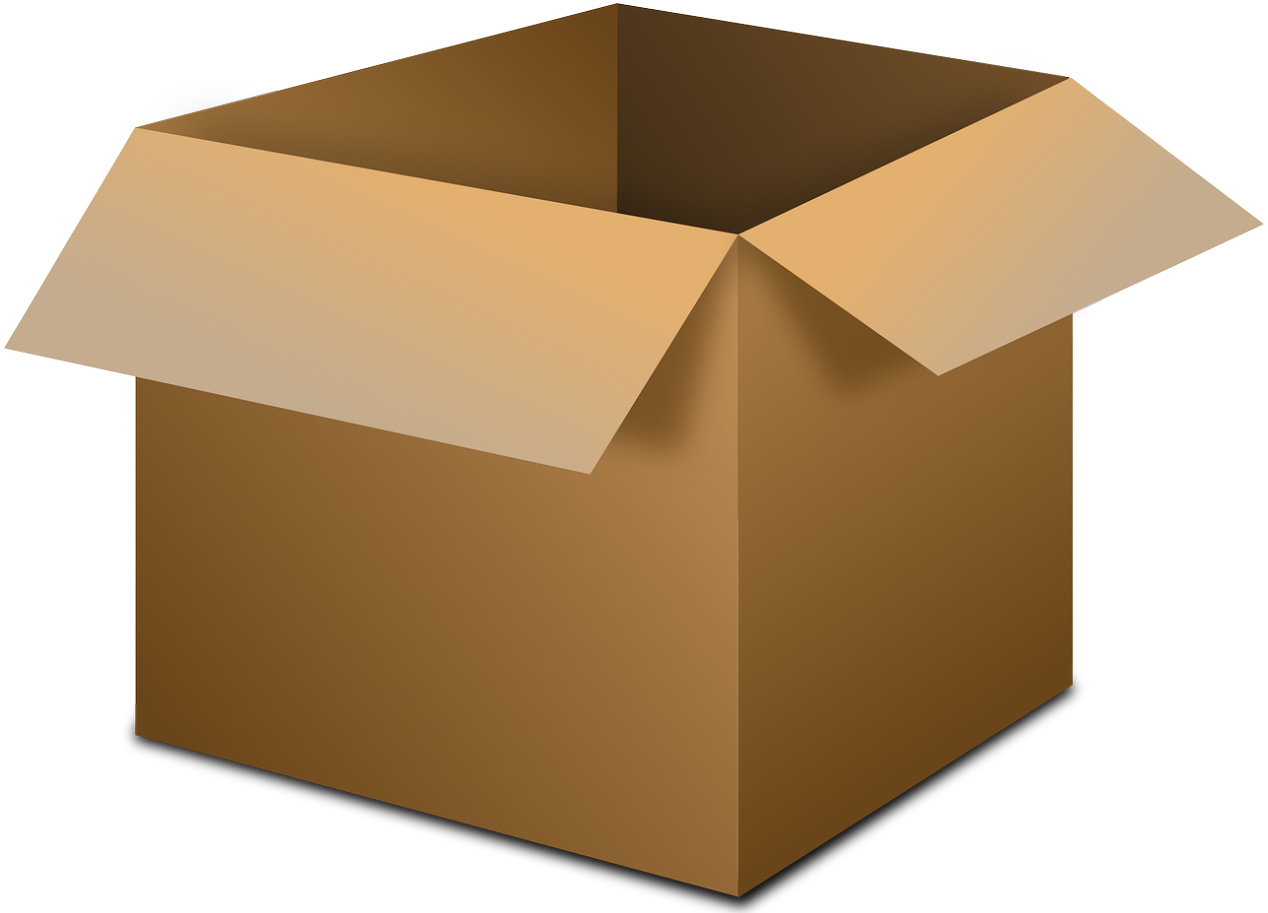
Innovation

– is a process of **turning opportunity into new ideas** and **of putting these into widely used practice**. (Tidd, Joseph 2013)

– **機会を新しいアイディアへと転換**し、さらにそれらが**広く実用に供せられるようにする過程**である（玉田俊平太 訳）

– **“創新普及”**

Thinking outside the box.



New value proposition

Orchestrate implementation.

Solid start

Accelerate penetration.

Growth

Keio EDGE Person

does

Find insight
Orchestrate implementation
Accelerate penetration

aims

New value proposition
Solid start
Growth

behaves

Ideation
Structuration
Thinking different

Not necessarily startup CEO's but various type of innovators.
Innovators willing to make changes in the world.

Keio EDGE Program Course Work

Keio EDGE Program
Course Work Aim

What you have

Strong domain knowledge

Entrepreneur mindset

Have many international friends

What you learn and do

Innovative thinking

Course work

Project work

by **design thinking** lectures and exercises

be familiar with the **mindset** and the **tool set**

by **systems thinking** lectures and exercises

be familiar with the **way of thinking** and some **diagrams**

by **financial synthesis** lectures and exercises

be familiar with the **concept** and **basic techniques**

What you become

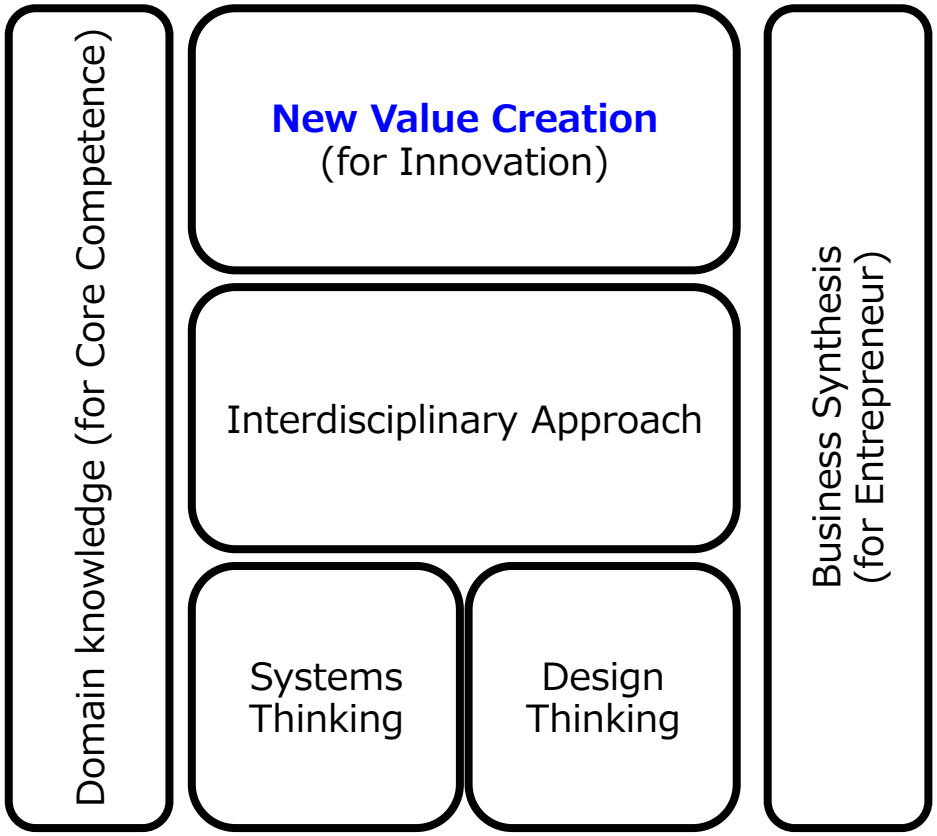
New value proposition capability

New business synthesis capability

Interdisciplinary approach capability

It is an intensive course to get you ready for Project work.
Both mindset and tool sets will be taught through lectures and exercises.

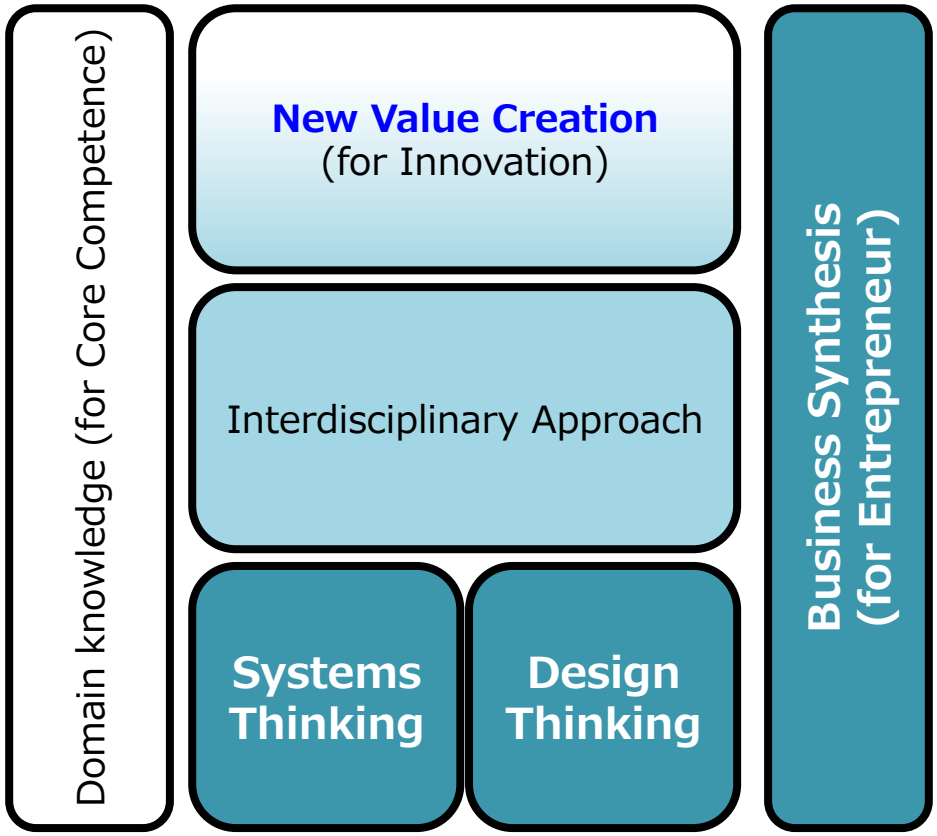
Keio EDGE Program
Course Work Design



Interdisciplinary approach via Systems Thinking and Design Thinking.
Business synthesis mindset and techniques are covered.

Keio EDGE Program
Course Work Design

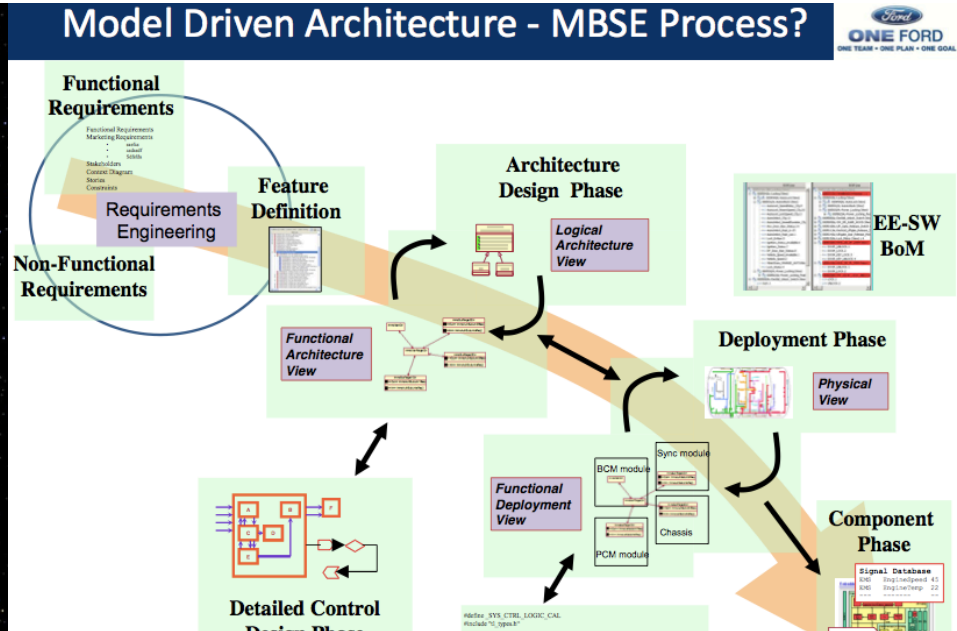
Keio EDGE person's *capability structure model*



Interdisciplinary approach via Systems Thinking and Design Thinking.
Business synthesis mindset and techniques are covered.

Keio SDM has strong background: **Systems Engineering** Master's Degree

- Nations **only** university to provide degree program in Systems Engineering.
- Offers training programs for many **companies**: JAXA, NEC, MELCO, HONDA, NISSAN, more



Think innovative, Divergent/Convergent thinking, Insight

- **Think innovative**
  - **Out of the box**!! You need to **know the box**, too.
  - Not a crazy idea generation. **New** and **valuable**.
- **Divergent/Convergent thinking**
  - **Explore** and **expand** the solution space.
  - **Organize** and **focus** to find the way out the box.
- **Insight**
  - **unusual** but **interesting**
  - **unfamiliar** but **convincing**

Systems Thinking and Systems Approach

Systems Thinking

a discipline for **seeing wholes** ...
a framework for **seeing interrelationships** rather than things ...
a process of discovery and diagnosis ...
and as a sensibility for the **subtle interconnectedness** that gives living systems their unique character.

(Senge, P.M. 1990, 2006. The Fifth Discipline: The Art and Practice of the Learning Organization. New York, NY, USA: Doubleday Currency, 68-69)

Systems Thinking and Systems Approach
(e.g. Systems Engineering)

The systems approach is a way of tackling real world problems and **making use of the concepts, principle and patterns of systems thinking to enable systems to be engineered and used**.

(INCOSE Systems Engineering Body of Knowledge, http://www.sebokwiki.org/wiki/What_is_Systems_Thinking%3F)

Systems Thinking

- As a **whole** and a **part**
- **Interrelationship**

- **MECE** boundaries
- Multiple **viewpoints**
- Level of **abstraction**

Systems Thinking

- As a **whole** and a **part**
  - example of biggest system?
  - example of smallest system?
  - what are contexts?
- **Interrelationship**
  - examples of interrelationships with you and a person next to you?
- **MECE** boundaries
  - how do you divide people in this room?
- Multiple **viewpoints**
  - with what perspective do you dive people in this room?
- Level of **abstraction**
  - at what level of abstraction are you talking about?

Why Systems Approach beneficial for entrepreneurs in global context?

Systems approach is

- to understand ***exactly what you need to do***.
- to provide a ***valid solution***.
- to ***leverage*** on existing solutions.
- to deal with ***complexity, scale,*** and ***dynamics***.
- to tackle ***domain free***.
- to ***design and implement*** your solution ***right***.

What is a “system”?

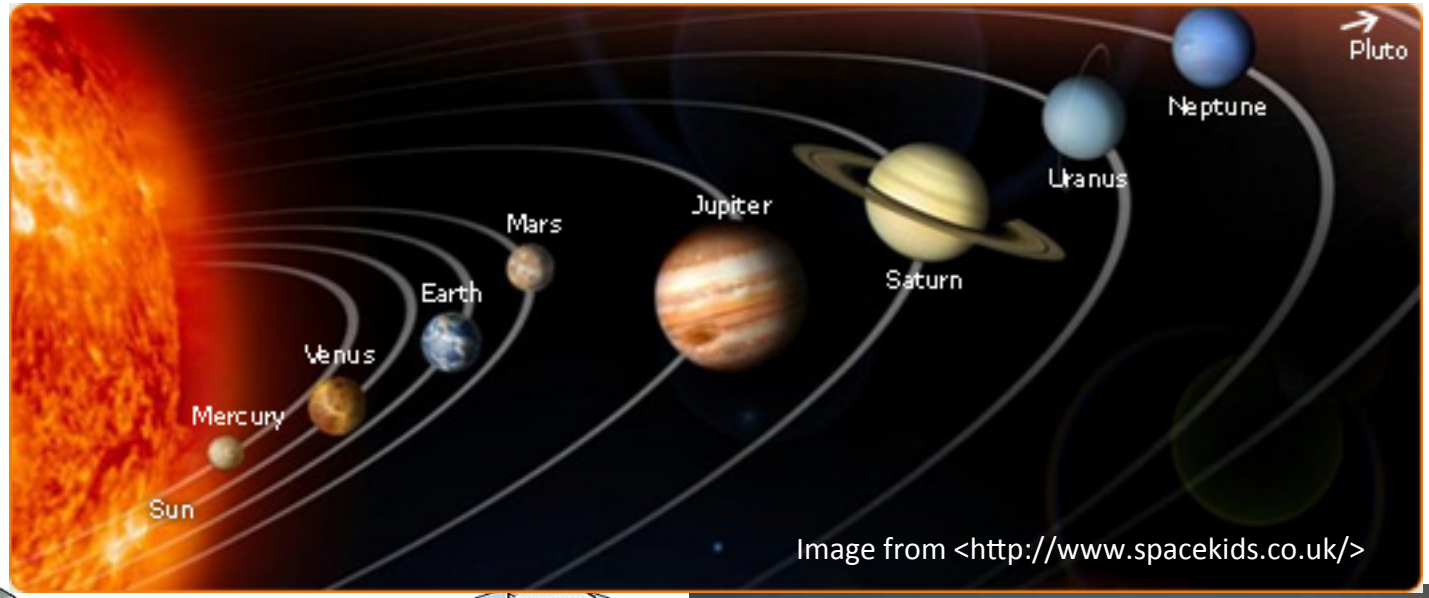


Image from <http://www.spacekids.co.uk/>

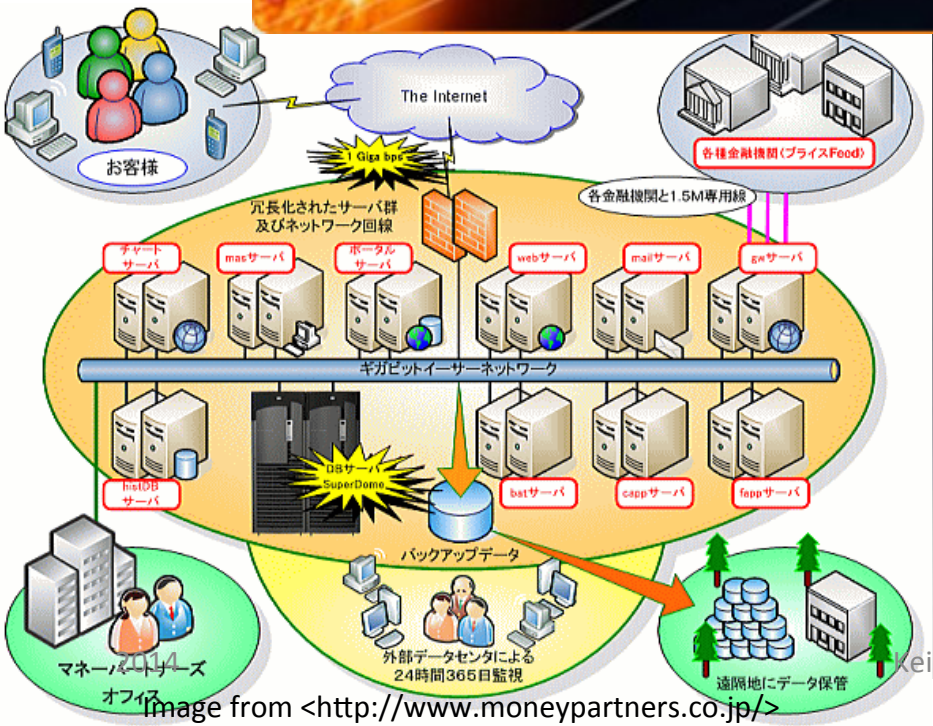


Image from <http://www.moneypartners.co.jp/>

Image from <http://www.tamoshop.com>

System

- Definition of system
  - "An **interacting combination of elements to accomplish a defined objective**. These include hardware, software, firmware, people, information, techniques, facilities, services, and other support elements."
    （INCOSE* SE Handbook v2)
  - "An aggregation **of end products** and **enabling products** to achieve a given purpose."（ANSI/ EIA-632, 1998）

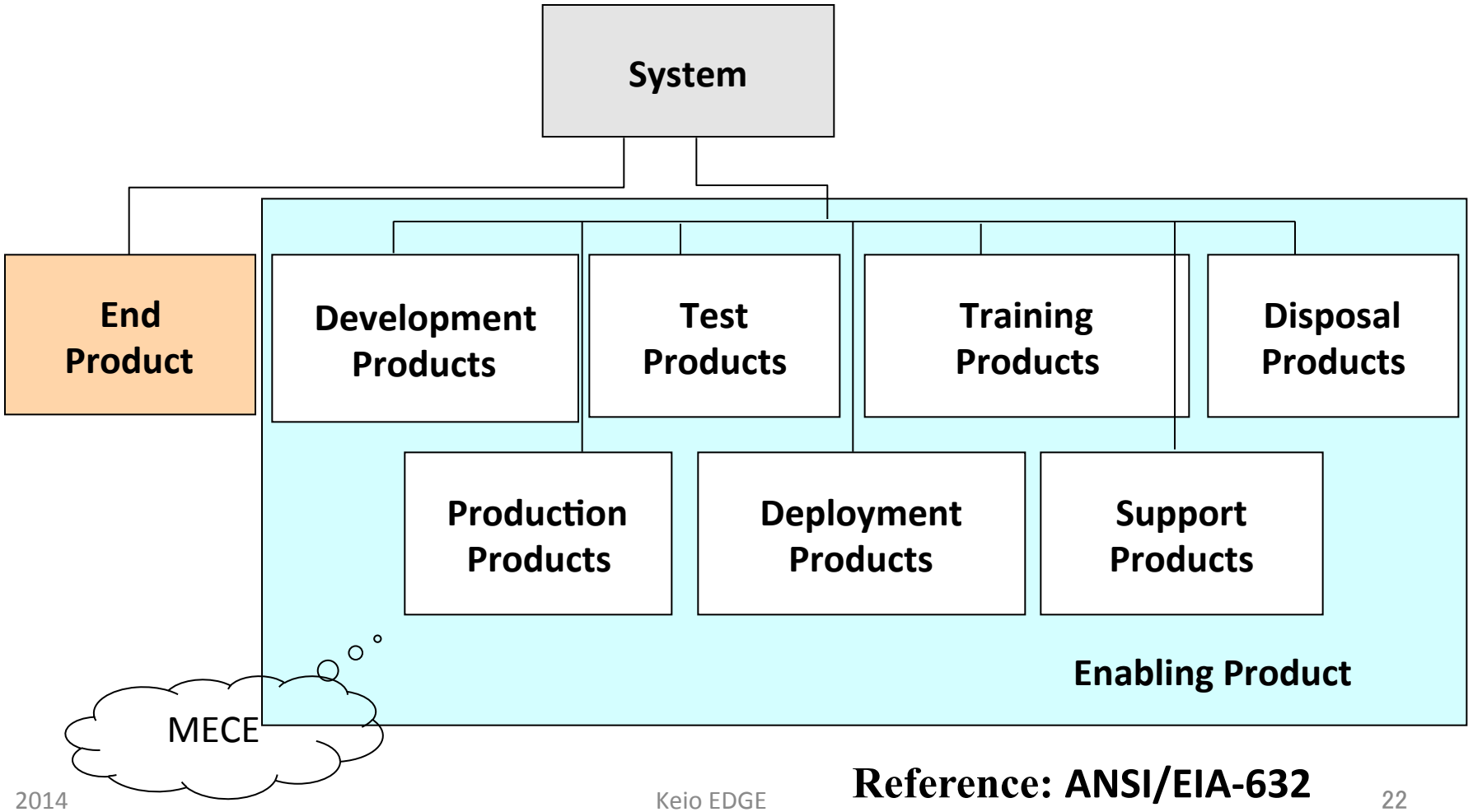
(INCOSE : International Council on Systems Engineering
http://www.incose.org)

Basics of Systems Approach

- All system consists of "**end product**" and "**enabling product**".
- All system has "**subsystem(s)**".
- All system has its "**life cycle**".

Definition

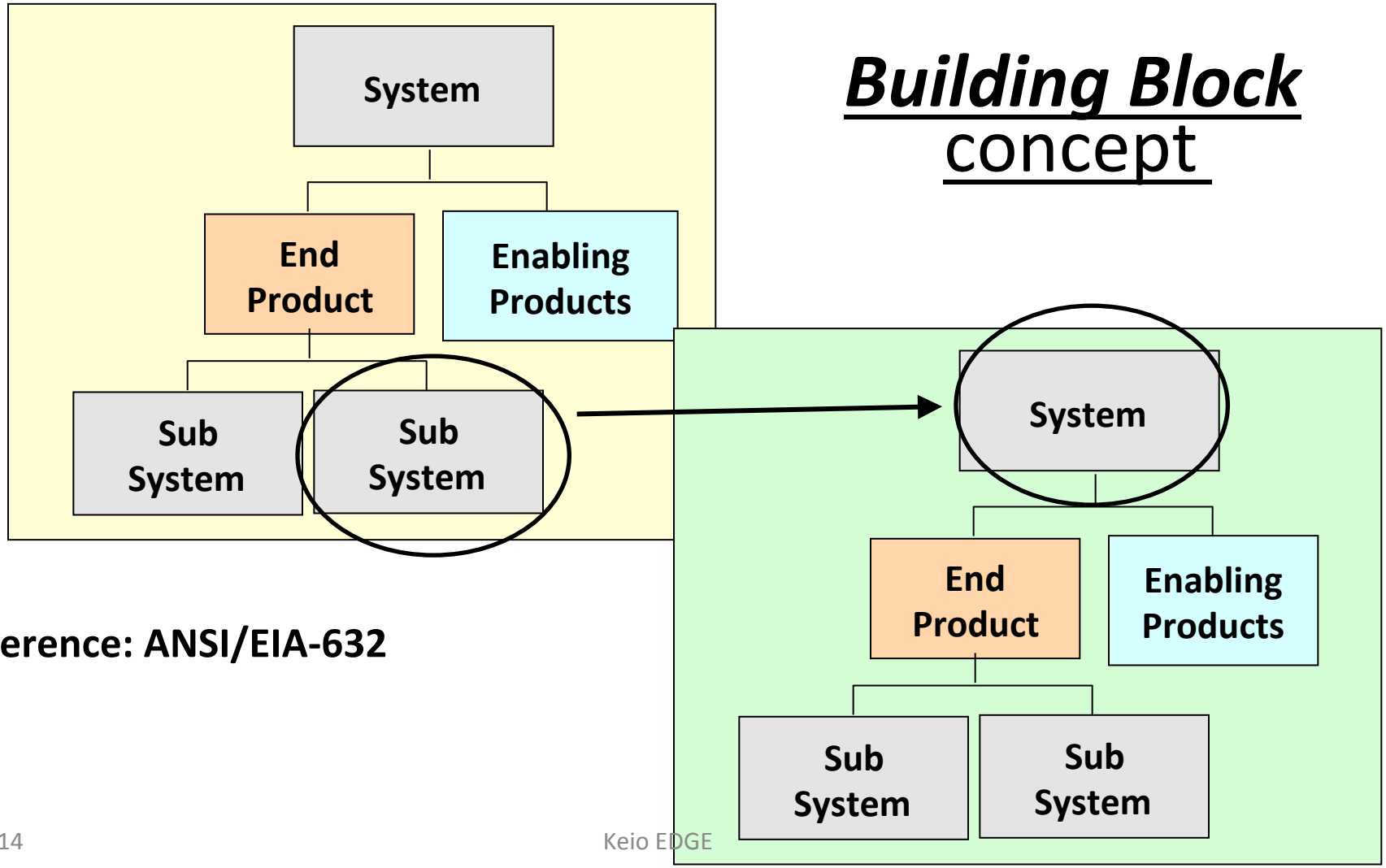
- All system consists of "**end product**" and "**enabling product**".



Reference: ANSI/EIA-632

Definition

- All system has "**subsystem(s)**".



Building Block concept

Reference: ANSI/EIA-632

Life Cycle

- All system has its "**life cycle**".

Reference: ISO/IEC 15288 Life Cycle Definition

Concept Stage	Development Stage	Production Stage	Utilization Stage	Retirement Stage
			Support Stage	

LIFE CYCLE STAGES	PURPOSE	DECISION GATES
CONCEPT	*Identify stakeholders' needs* *Explore concepts* *Propose viable solutions*	*Decision Options* *– Execute next stage* *– Continue this stage* *– Go to a preceding stage* *– Hold project activity* *– Terminate project*
DEVELOPMENT	*Refine system requirements* *Create solution description* *Build system* *Verify and validate system*	
PRODUCTION	Produce systems Inspect and test [verify]	
UTILIZATION	*Operate system to satisfy users' needs*	
SUPPORT	*Provide sustained system capability*	
RETIREMENT	*Store, archive, or dispose of the system*	

Systems Approach we talk about today

- **Value Graph (upper half)**
  - purpose and alternative viewpoint
  - higher purposes and alternative ideas
- **Causal Loop Diagram**
  - cause-and-effect viewpoint
  - causes and effects
- **Customer Value Chain Analysis (CVCA)**
  - value chain viewpoint
  - stakeholders and their values
- **Function and Physical Architecture**
  - function and physical viewpoints
  - functions and physical structures