



THE COLLABORATORY

Problem Solving + Collaboration
in the Learning Environment

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Questions related to specific materials, methods, and services will be addressed at the conclusion of each presentation.

The Collaboratory

Problem Solving & Collaboration in the Learning Environment



Learning Objectives

1. Have familiarity with problem solving in the learning environment.
2. Know significance of Design Thinking as a problem solving method.
3. Understand organizational strategy of collaborative problem-solving spaces.
4. Understand Criteria for designing a Collaboratory.

The Collaboratory

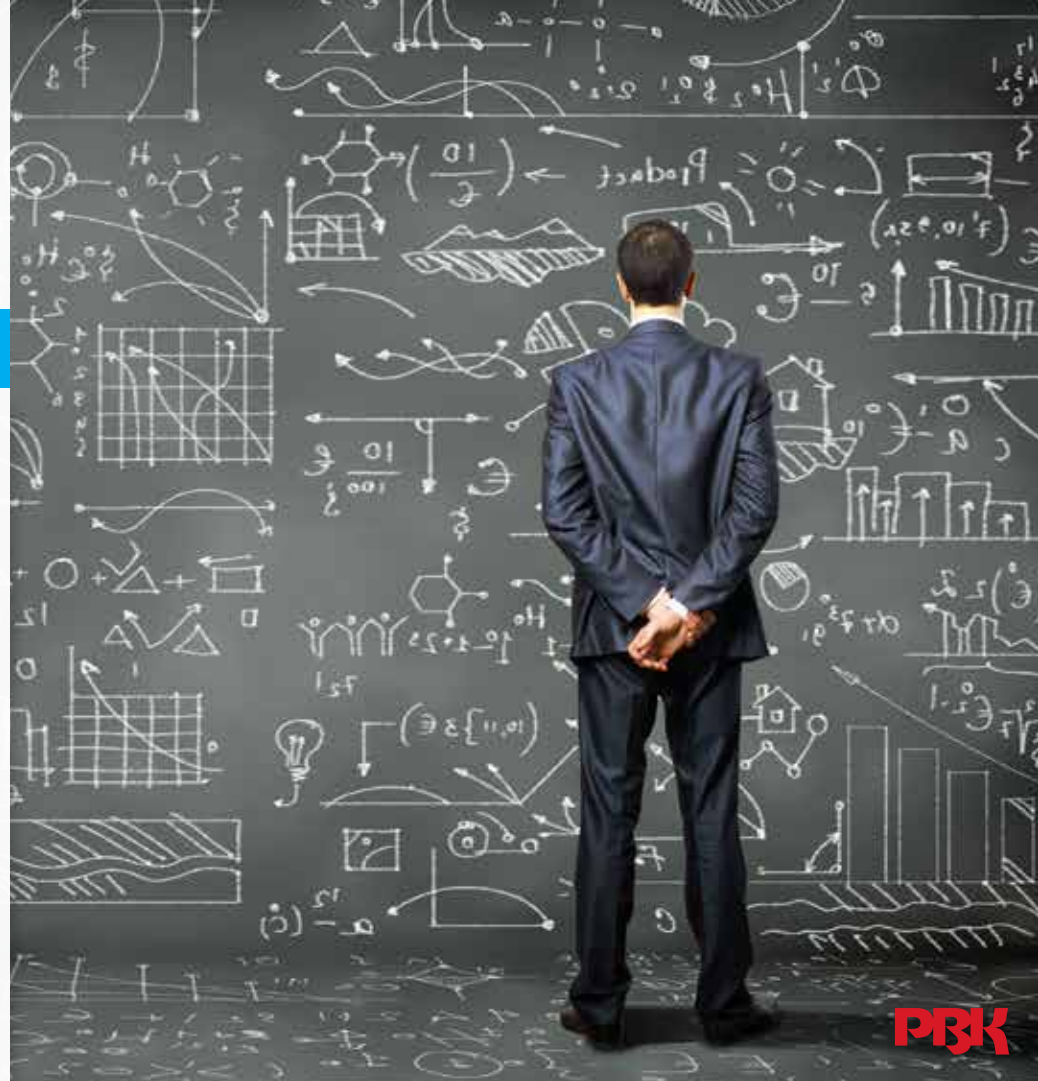
Problem Solving & Collaboration in the Learning Environment

INTRODUCTION

Problems

Solutions

Case Studies



“ ALL LIFE IS
PROBLEM
SOLVING ”


Karl Popper



CO-LAB
COLLABORATORY
COLLABORIUM




PLACE FOR
PROBLEM
SOLVING

A photograph of three men in a workshop or office setting. They are standing in front of a large wall covered with numerous small, colorful photographs and diagrams. The man on the left is bald, wearing glasses, a dark blue sweater, and dark jeans. The man in the middle is wearing a light blue button-down shirt, a dark cap, and dark jeans. The man on the right is wearing a dark purple hoodie, a dark cap, and dark jeans. They appear to be engaged in a collaborative activity, possibly a design or research session. A large blue circle is overlaid on the left side of the image, containing the text 'SUPPORTS HUMAN INTERACTION'.

SUPPORTS
HUMAN
INTERACTION



ENGAGES
MULTIPLE
DISCIPLINES &
GROUPS

A modern office interior featuring a brick wall with a colorful mural on the right. A room with a wooden floor, several chairs, and ottomans is visible through an opening. The ceiling has exposed pipes and ductwork. A large blue circle on the left contains the text "FOSTERS INNOVATIVE THINKING".

FOSTERS
INNOVATIVE
THINKING

A group of people are gathered around a dark table, working on various electronic projects. In the foreground, a person's hands are visible, using a red-handled screwdriver to work on a green printed circuit board (PCB) inside a metal case. The table is cluttered with tools, including screwdrivers, pliers, and a soldering iron. There are also several yellow and blue sticky notes scattered around, some with handwritten notes. A Starbucks cup with a green straw is on the left side of the table. In the background, other people are visible, some holding up their phones. The overall scene suggests a collaborative learning or workshop environment.

UTILIZES
PROBLEM
SOLVING
TOOLS

Collaboration + Laboratory




a process of value creation that traditional structures of communication and teamwork can't achieve

Michael Schrage, No More Teams!

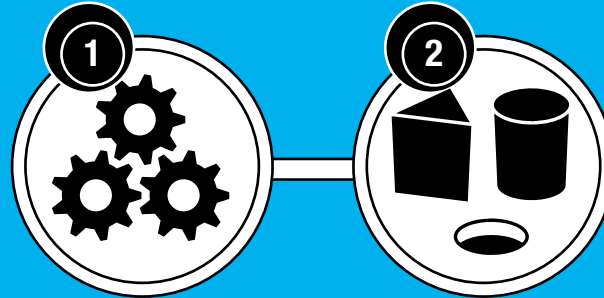


a facility that provides controlled conditions in which research and experiments can be conducted using an employed methodology

A dense collage of colorful sticky notes (yellow, pink, blue, orange, green) with various handwritten notes, drawings, and symbols. The notes are scattered across the frame, creating a textured, busy background. Some notes contain text in different languages, including English and Chinese. One prominent note in the center reads "Lisa Feb June 2007". Another note on the right says "GOOD THINGS NEVER DIE" with a signature. There are also various sketches and symbols scattered throughout.

WHAT ABOUT PROBLEM-SOLVING SKILLS?

- 1** Critical thinking and problem solving. 
- 2** Collaboration across networks and learning by influence. 
- 3** Agility and ability. 
- 4** Initiative and entrepreneurialism. 
- 5** Effective oral and written communication. 
- 6** Accessing and analyzing information. 
- 7** Curiosity and imagination. 



Ability to work in a team.

Ability to make decisions and solve problems.



Ability to plan, organize and prioritize work.



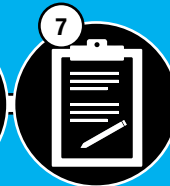
Ability to communicate verbally with people inside/outside of an organization.



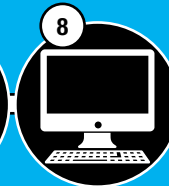
Ability to obtain and process information.



Ability to analyze quantitative data.



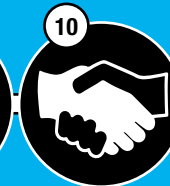
Technical knowledge related to the job.



Proficiency with computer software programs.

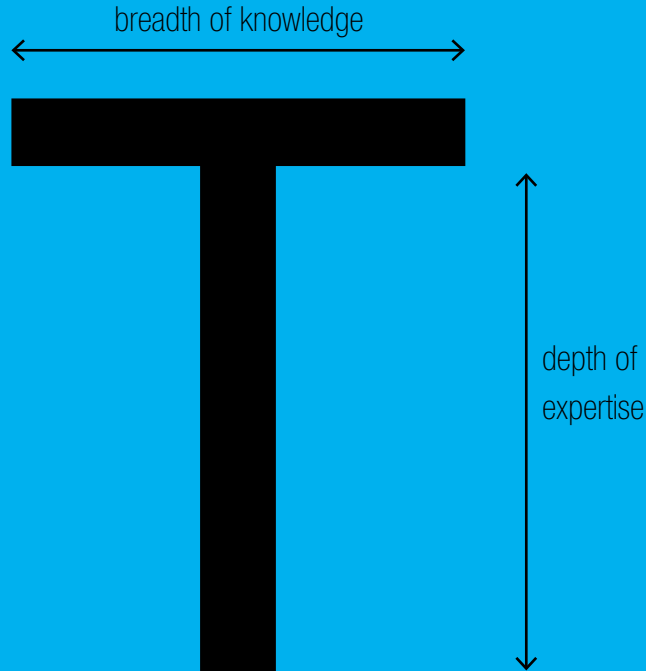


Ability to create and/or edit written reports.

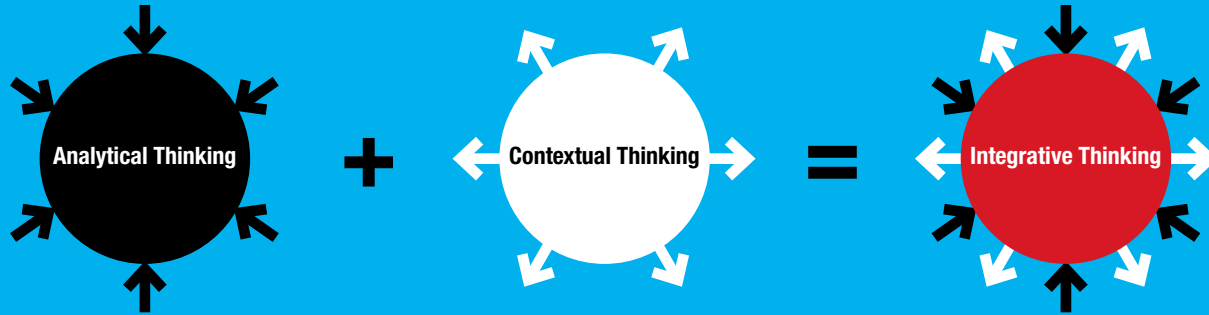


Ability to sell and influence others.

National Association of Colleges and Employers (NACE) Survey, 2013.



“ workers should possess a depth of expertise in at least one area but a horizontal breadth of knowledge in a broad set of related areas, allowing them to solve problems with colleagues across disciplines ”



“...to not only rely on analytical processes, but also exhibit the ability to see all of the salient - and sometimes contradictory - aspects of a confounding problem and create novel solutions that go beyond and dramatically improve on existing alternatives”



**“ an individual or firm that is recognized as an authority...
and whose expertise is sought and often rewarded. ”**

WHAT IS A THOUGHT LEADER?. FORBES, MARCH 2012.

EFFECTIVE WORKPLACES BALANCE FOCUS & COLLABORATION

FACE-TO-FACE ENDURES

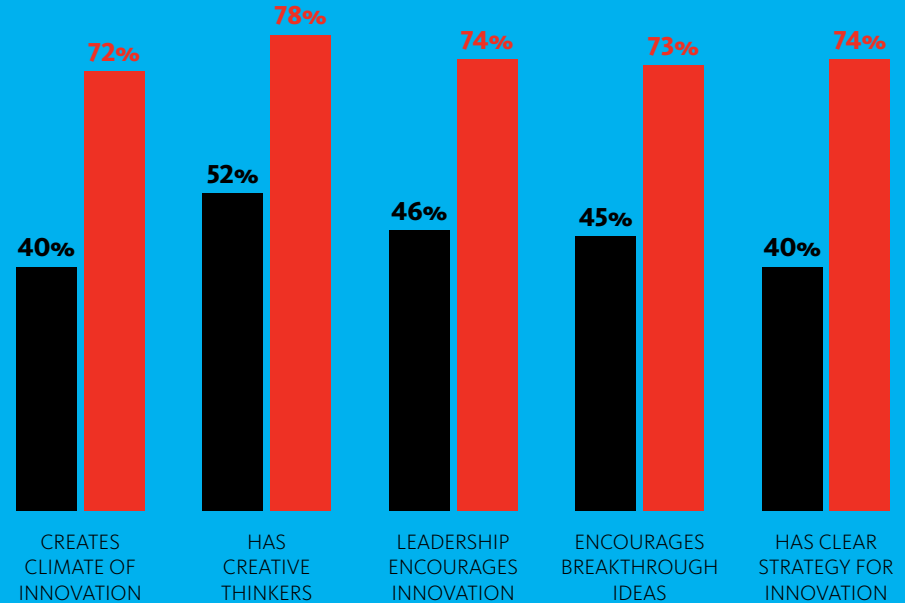


A study by MIT researchers was able to predict 35% of a team's performance simply by measuring the number and quality of face-to-face interactions between team members.

Balanced Workplaces Are More Creative, More Innovative

Percentage of employees who rank their company highly.

■ Not Balanced
■ Balanced



HOW CAN WE
DEVELOP A CULTURE
OF COLLABORATION
& PROBLEM SOLVING
IN THE LEARNING
ENVIRONMENT?

The Collaboratory

Problem Solving & Collaboration in the Learning Environment

Introduction

Problems

Solutions

Case Studies





WHAT IS A

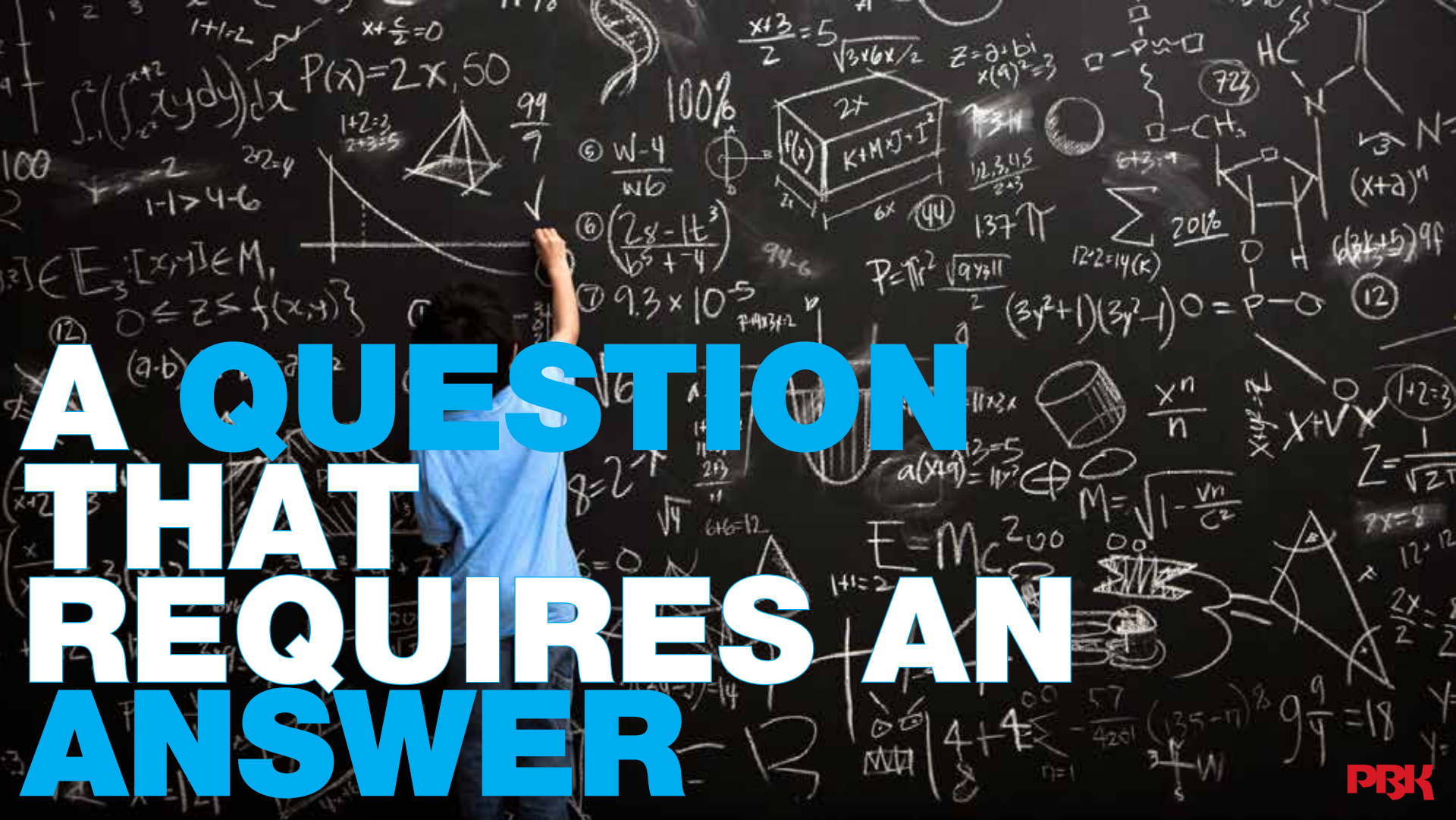
PROBLEM?



**AN
UNWELCOME
SITUATION**



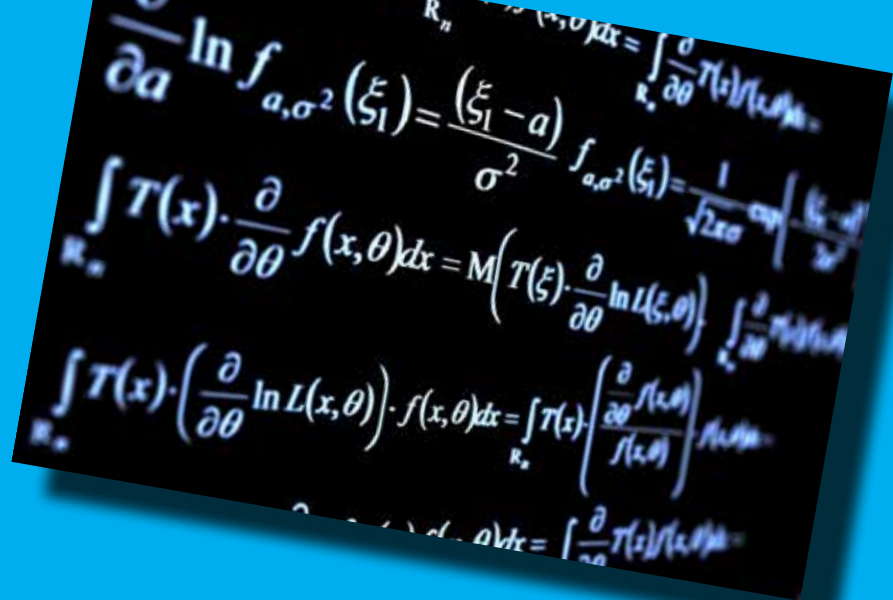
**A SOURCE
OF DISTRESS**



A QUESTION THAT REQUIRES AN ANSWER

CHANGE
• CREATE • IMPROVE
• INNOVATE

**AN OPPORTUNITY
FOR CHANGE**



WHAT ABOUT
COMPLEX

PROBLEM?



CITY PLANNING

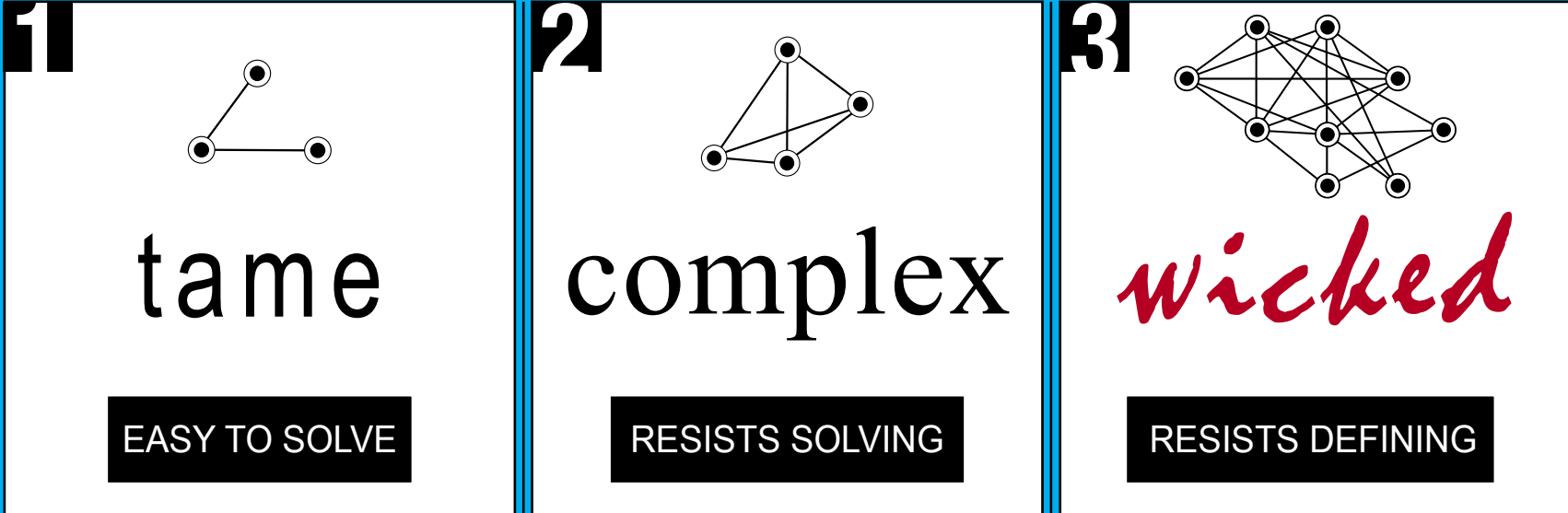


**AFFORDABLE
HEALTH CARE**



DISASTER RELIEF

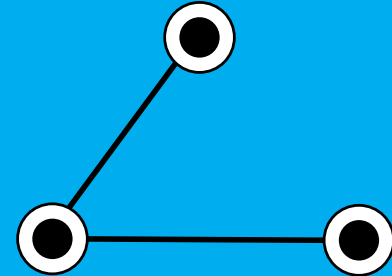
Problems Typologies



level of difficulty →

a **tame** problem...

- 1 can be solved in a linear fashion using straightforward, reductionist, repeatable, sequential techniques.
- 2 is amenable to traditional project management approaches and they introduce limited/known/manageable consequences and no unintended consequences.
- 3 is well defined, its solution is clear and can be given to a designer to create detailed specifications and project manager to implement.



MAKING SENSE OF IS WITH THE CYNEFIN FRAMEWORK

HELEN HASAN, ALANAH KAZLAUSKAS

PACIFIC ASIA CONFERENCE ON INFORMATION SYSTEMS (2009)

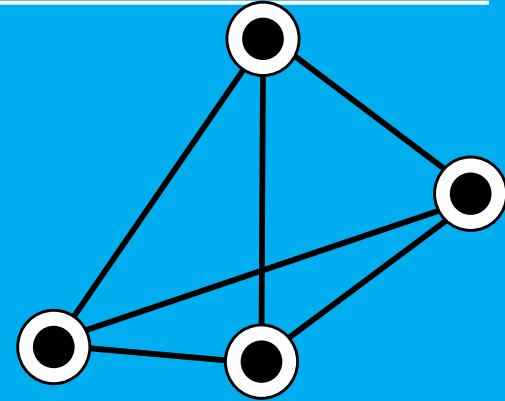
[HTTP://AISEL.AISNET.ORG/PACIS2009/47/](http://aisel.aisnet.org/pacis2009/47/)

BERNARD ROBERTSON-DUNN

24 MARCH 2011

a **complex** problem...

- 1 tends to be non-linear, difficult to understand and their solutions can lead to other problems and unintended consequences.
- 2 is not always solved by traditional analytic and project management techniques.
- 3 is not solvable by reductionist or sequential approaches.



MAKING SENSE OF IS WITH THE CYNEFIN FRAMEWORK

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[HTTP://AISEL.AISNET.ORG/PACIS2009/47/](http://aisel.aisnet.org/pacis2009/47/)

BERNARD ROBERTSON-DUNN

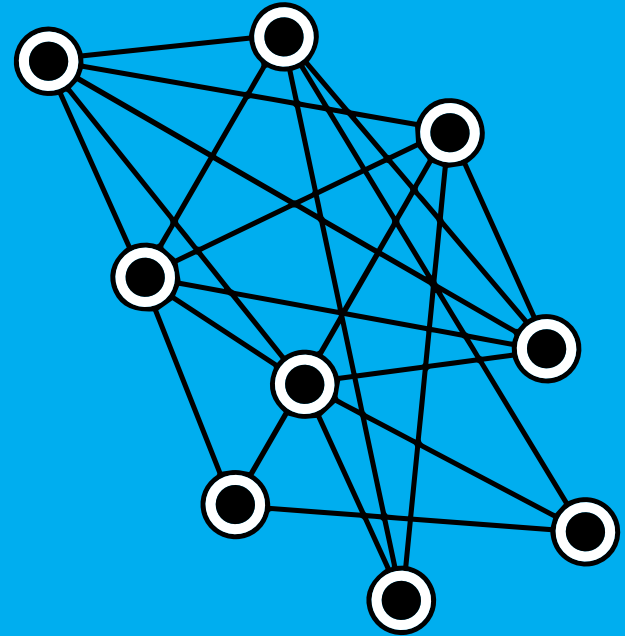
24 MARCH 2011

a

wicked

problem...

- 1 has no definitive formulation.
- 2 is hard, maybe impossible, to measure or claim success.
- 3 has solutions that can be only good or bad, not true or false.
- 4 has no template to follow when tackling.
- 5 always has more than one explanation.
- 6 is a symptom of another problem.
- 7 does not have a definitive scientific test to prove success.
- 8 is often “solved” through a “one shot” design effort.
- 9 is always unique.



MAKING SENSE OF IS WITH THE CYNEFIN FRAMEWORK

HELEN HASAN, ALANAH KAZLAUSKAS

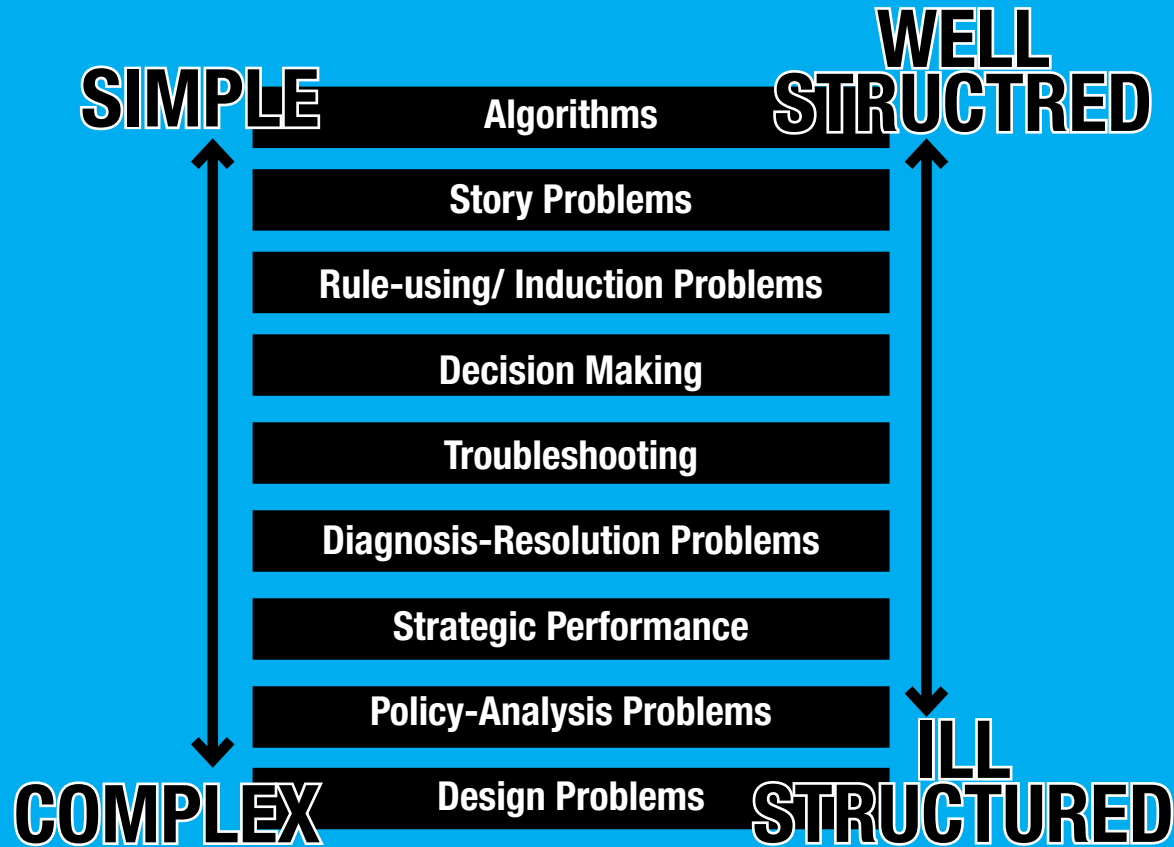
PACIFIC ASIA CONFERENCE ON INFORMATION SYSTEMS (2009)

[HTTP://AISL.AISNET.ORG/PACIS2009/47/](http://aisel.aisnet.org/pacis2009/47/)

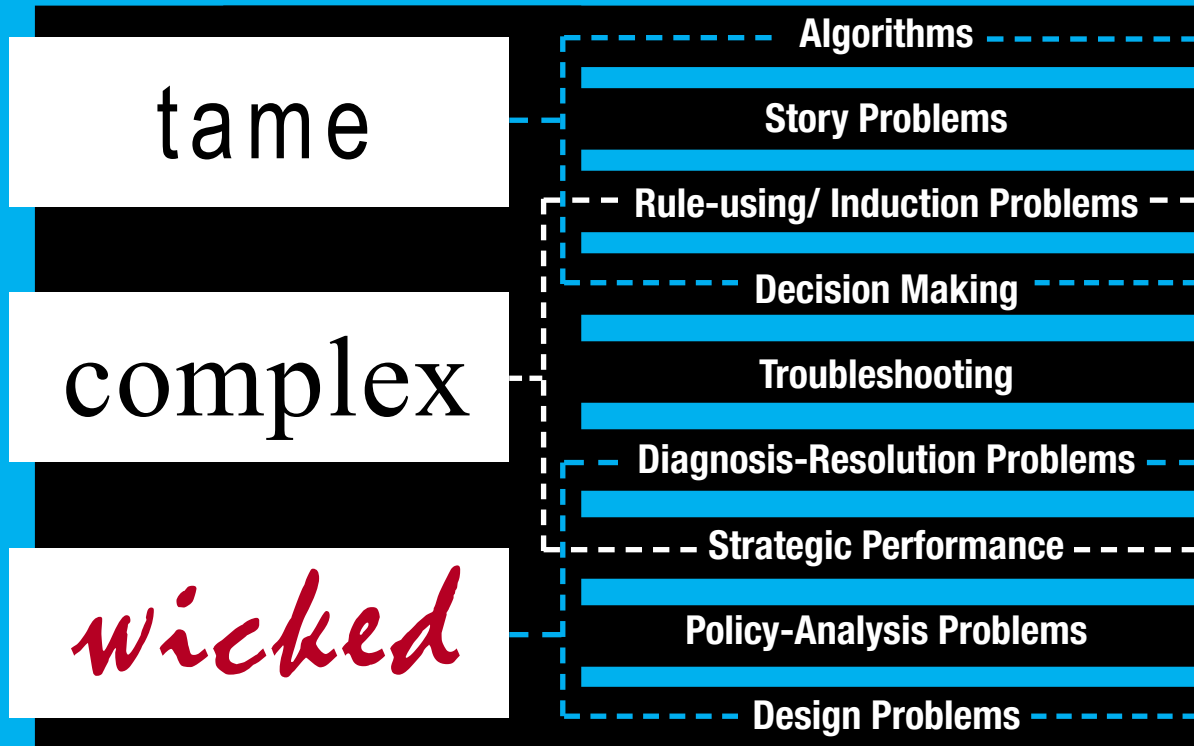
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24 MARCH 2011

Problems Typologies



Problems Typologies





YOUR TURN:

**IDENTIFY THE
PROBLEM TYPE**



CHILDHOOD OBESITY



A FLAT TIRE



A DISTRICT IPAD PROGRAM

HOW CAN WE
NURTURE TODAY'S
STUDENTS TO
BECOME FUTURE
PROBLEM SOLVERS
& THOUGHT LEADERS?

The Collaboratory

Problem Solving & Collaboration in the Learning Environment

Introduction

Problems

SOLUTIONS

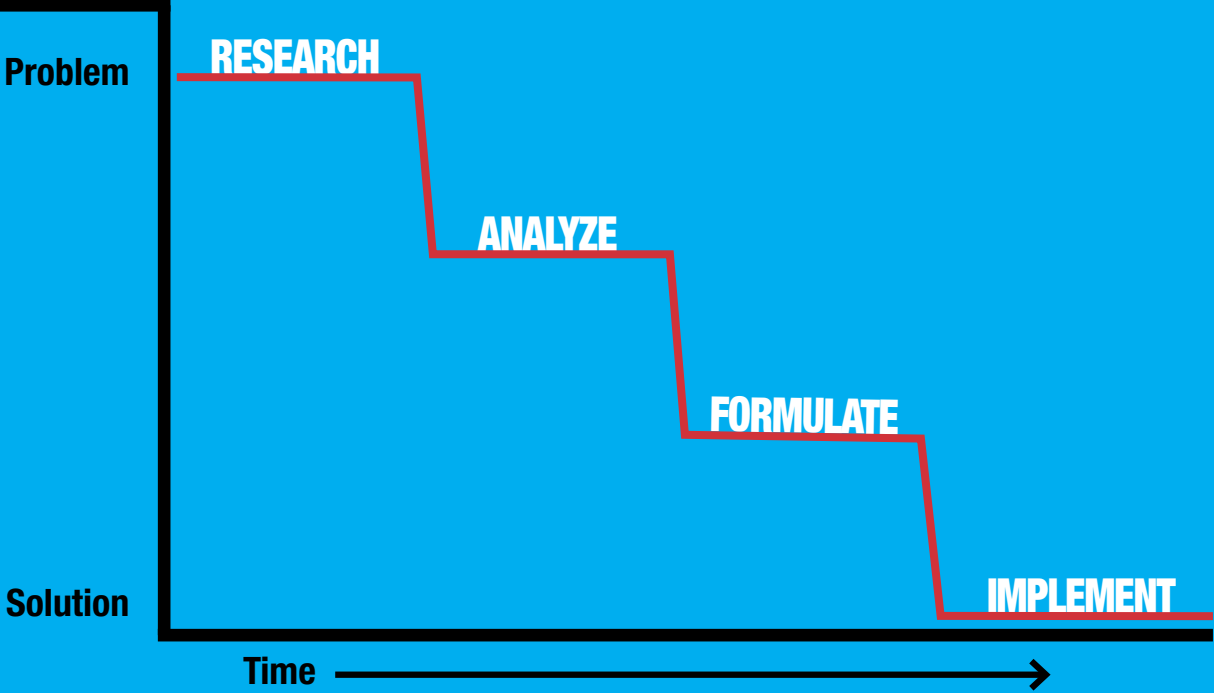
Case Studies



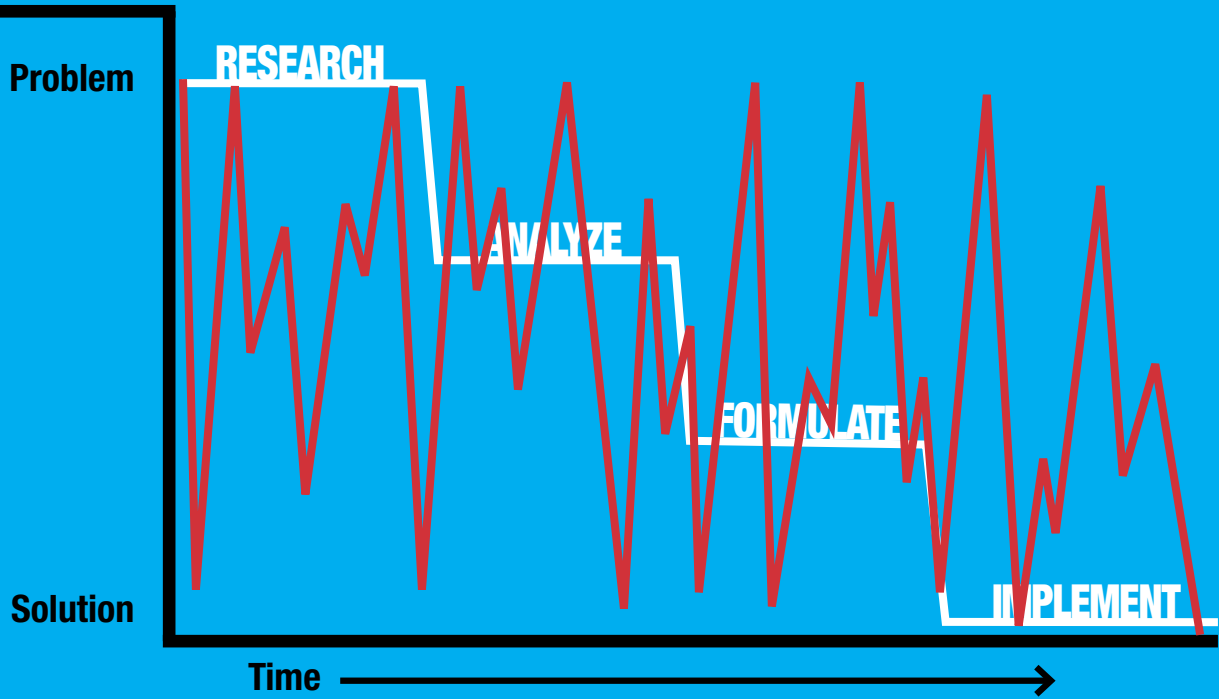


PROBLEM SOLVING METHODS

LINEAR METHOD



DESIGN THINKING



DESIGN THINKING PROCESS

Understand

Understanding ends in **insight**.

EMPATHY

DEFINE

Create

Creation ends in **ideas**.

IDEATE

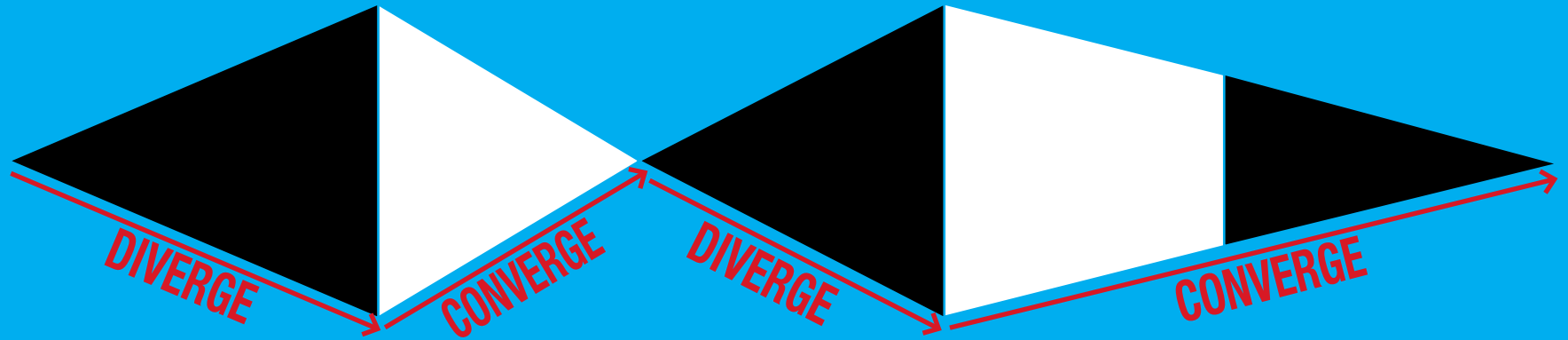
Deliver

Delivery ends in **reality**.

PROTOTYPE

TEST

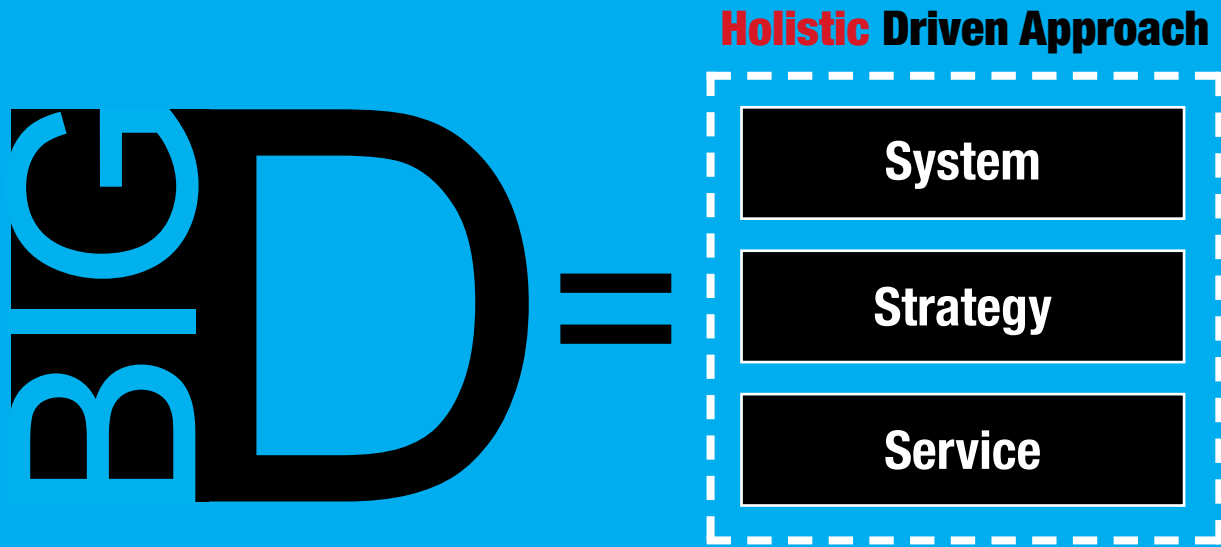
DESIGN THINKING PROCESS



Divergent Thinking = Generating lots of ideas.

Convergent Thinking = Judging options,
making decisions.

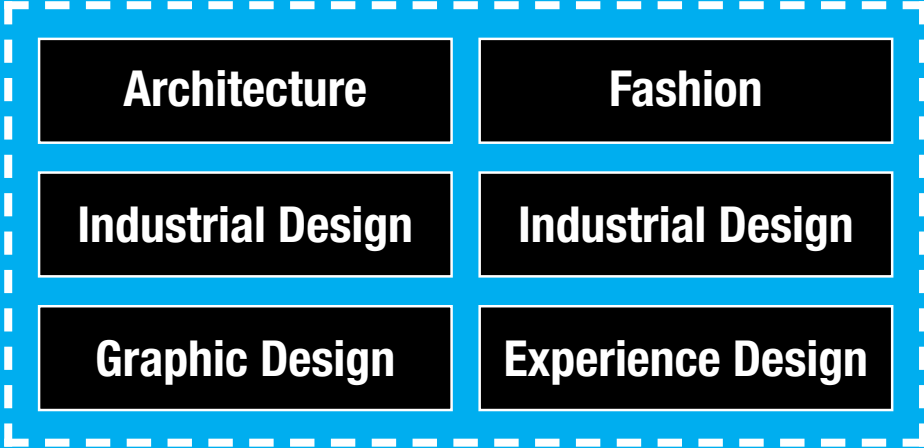
mind vs **little**



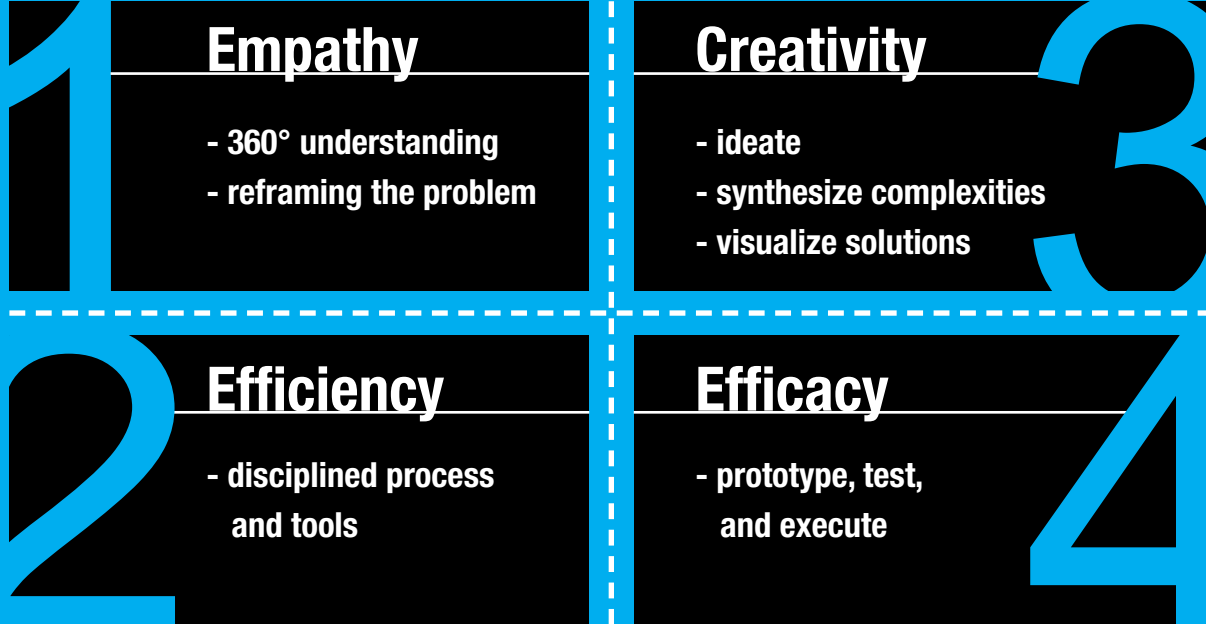
define

==

Aesthetic Driven Approach



DESIGN THINKING PRINCIPLES



WHAT IS THE KEY
FACTOR TO SUCCESSFUL
DESIGN THINKING
& SOLVING WICKED
PROBLEMS?



COLLABORATION

through COMMUNICATION
PARTNERSHIPS
SUPPORT



“But to today’s innovative worker, collaboration is what work is all about. In the old way of thinking, employees make themselves valuable through what they know. But in the new way, people make themselves valuable by seeking opportunities to work with other and tapping into the expertise that others possess.”

Collaboration Without Boundaries, Enabling Innovation, Changing the Workplace, et al. White Paper, June 2008.

**WHAT LEARNING SKILLS
CAN DESIGN THINKING
INSTILL IN STUDENTS?**



PROBLEM SOLVING

SKILLS
PRK



COLLABORATIVE SKILLS




COMMUNICATION

SKILLS
PRK



COGNITIVE SKILLS

A photograph of a vintage classroom. The room features light green wooden walls, a large map of the United States on the left wall, a globe on a shelf, and a tall, ornate metal stove in the center. Rows of wooden desks with attached chairs are arranged in the room. Some desks have books or papers on them. A window with a wooden frame is visible on the right wall. The overall atmosphere is that of a historical educational setting.

AN OLD EDUCATION MODEL

A modern, brightly lit classroom or meeting room. The room features a large window in the center, providing a view of an outdoor area with a fence and trees. The walls are light-colored with a textured lower half. On the left wall, there is a whiteboard. On the right wall, there is a whiteboard and a corkboard. The floor is light-colored and reflective. In the center of the room, there is a white, irregularly shaped table with several orange chairs. To the right, there are several orange and green ottomans. The overall atmosphere is clean, bright, and modern.

A NEW LEARNING MODEL

WHAT ARE THE
ACTIVE COMPONENTS
OF A **COLLABORATORY?**

COMPONENTS OF A COLLABORATORY

1	COLLABORATION	A problem solving adventure.
2	FACILITATION	An unbiased neutral leader who assists the collaboration to achieve their goals and aid the decision making process.
3	SHARED PARTICIPATION	Participation of people who are willing to share and engage in various sized teams and groups.
4	ACCOMODATIONS	Varied spatial, social, functional and psychological features that support the collaboration's goals.
5	MEDIA & TECHNOLOGY	An array of features that can express and enhance the validation and accommodations of the participants.

The Collaboratory

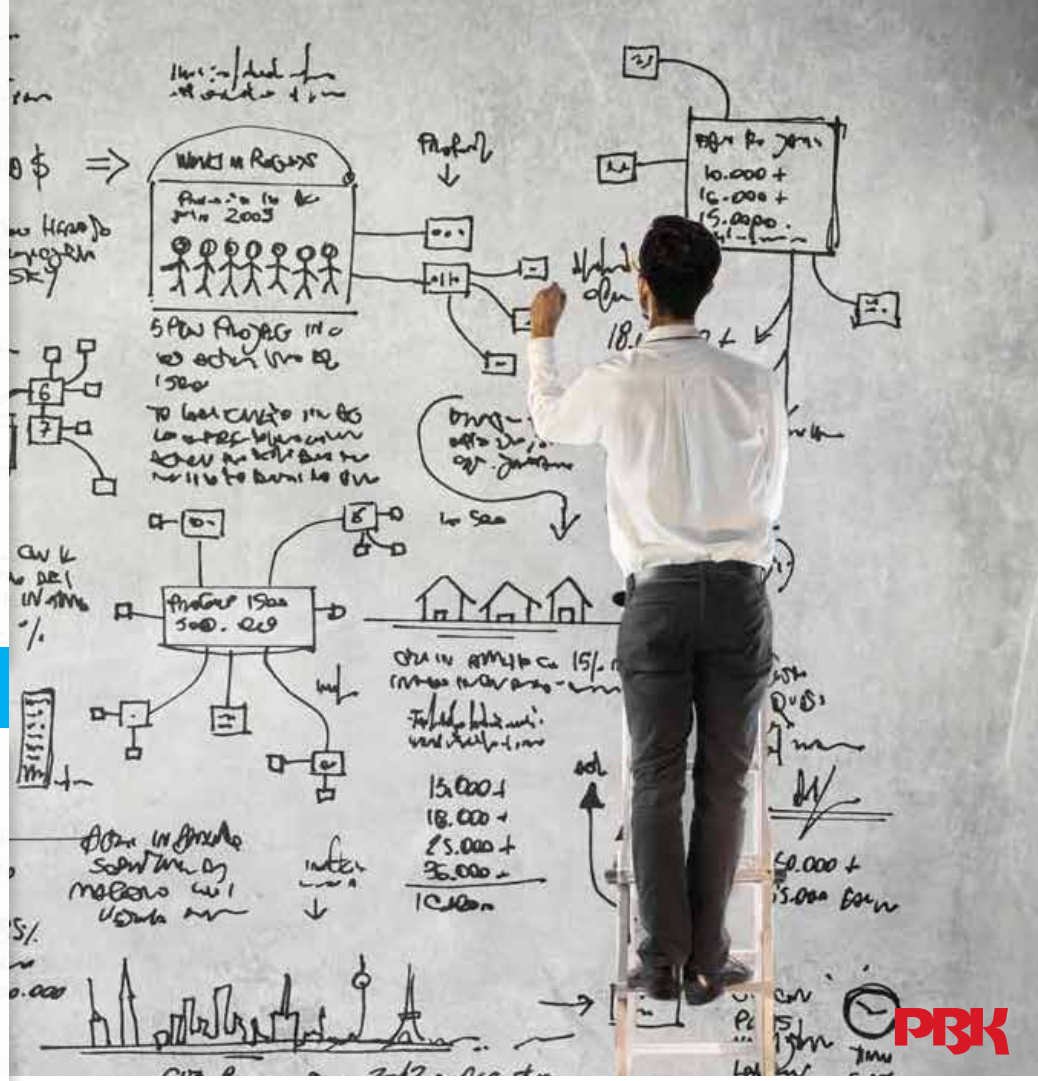
Problem Solving & Collaboration in the Learning Environment

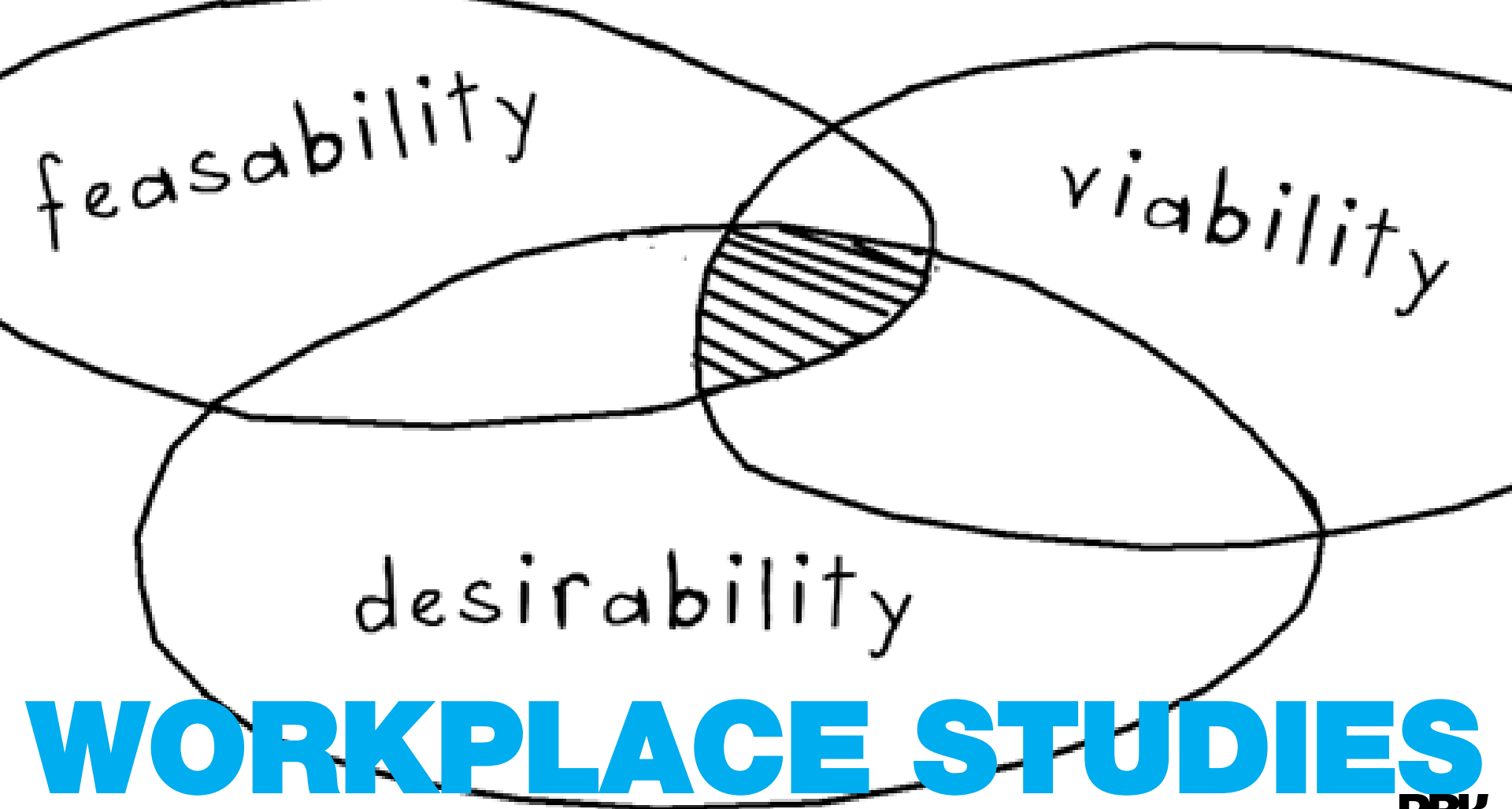
Introduction

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CASE STUDIES





WORKPLACE STUDIES

Cisco-Meracki Headquarters

San Francisco, California



2013
O + A Architects



d.school

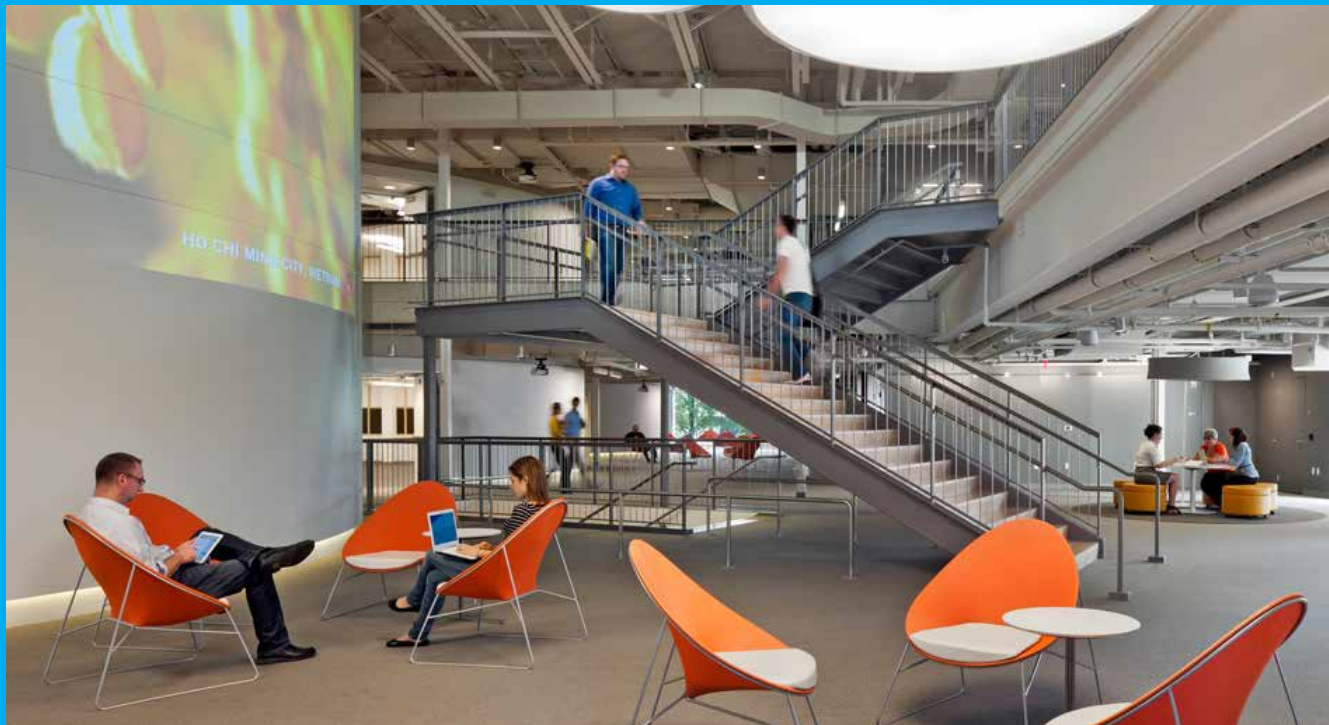
b.school

HIGHER-ED STUDIES

Harvard innovation lab

Harvard University

Allston, Mass



Opened Fall 2011
Shepley Bulfinch, Architects

Bloch Executive Hall for Entrepreneurship & Innovation

Bloch School of Management

University of Missouri - Kansas City



Opened Fall 2013

BNIM and Moore Ruble Yudell, architects and JE Dunn Construction



The background features a dark orange, almost black, surface with several large, three-dimensional, orange-colored geometric shapes. These shapes are interconnected and resemble stylized letters or abstract architectural forms. A prominent white, glowing outline of a large letter 'S' is visible on the left side. In the upper right, there are several thin, horizontal, glowing orange lines that look like recessed lighting strips. The overall aesthetic is modern and architectural.

K-12 STUDIES

Center for Advanced Professional Studies

Blue Valley Schools

Overland Park, Kansas



Q & A

THANK YOU.