

# LEAN IN DESIGN FORUM

MAY 31-JUNE 1 • CHICAGO, IL

## Lean Transformation of the Design Enterprise



Stan Chiu, AIA, LEED AP, HGA

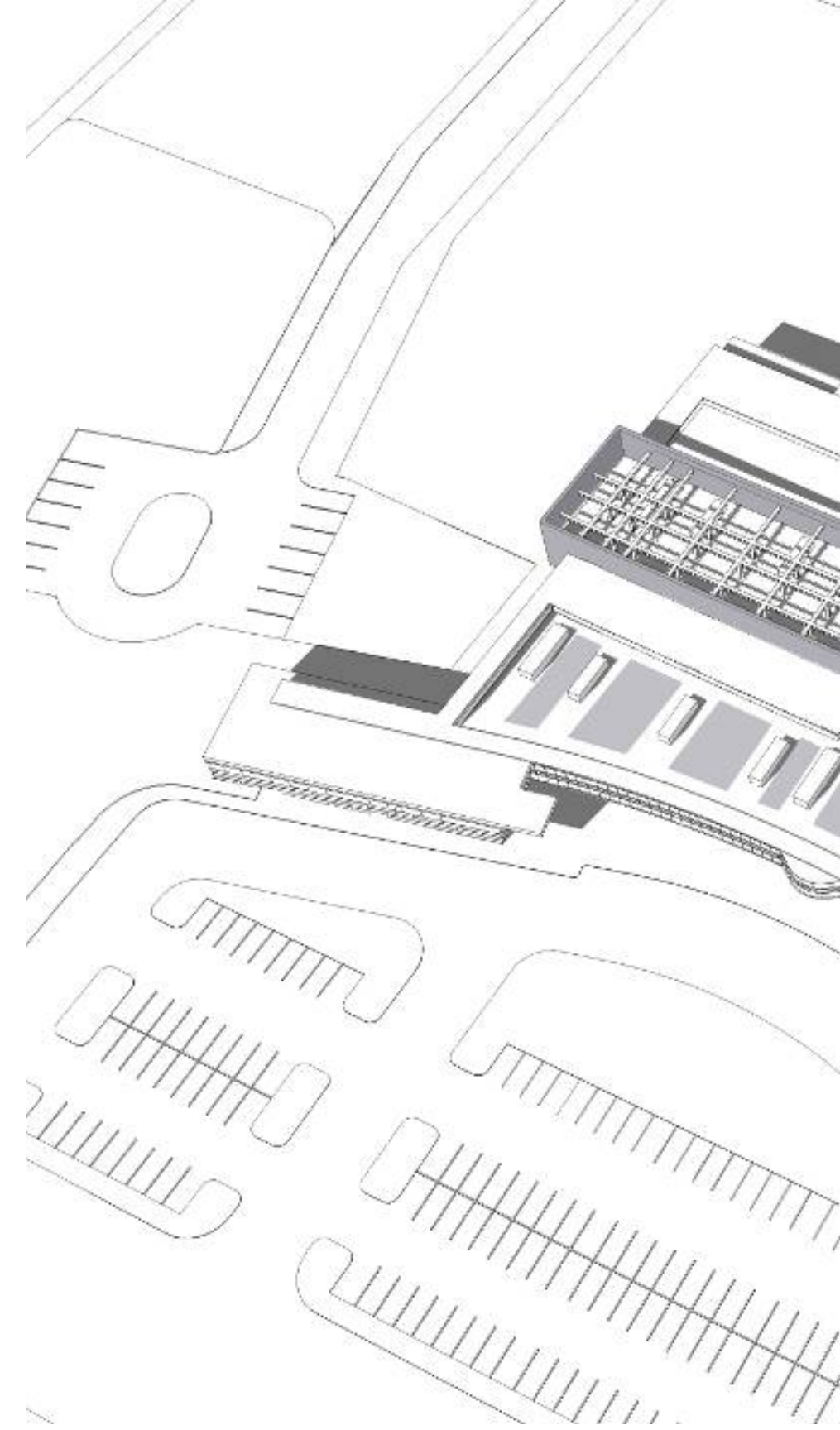
June 1, 2017

The pitch.



# Why are we here?

- Clients are asking for this.
- We are demonstrably good at it.
- It is a path to innovation.
- And most importantly...



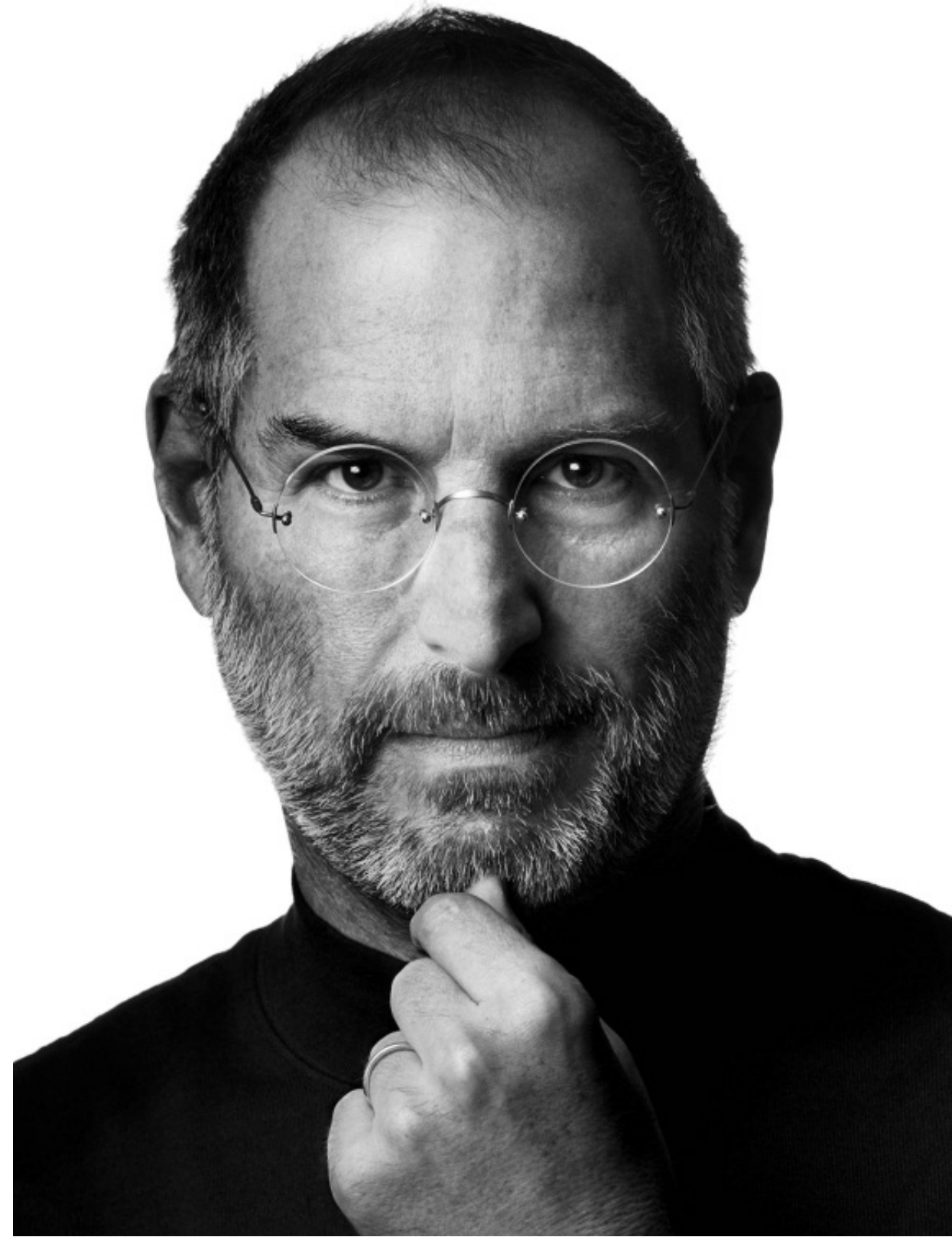


*I skate to where the puck is going to be,  
not where it has been.*



# Benchmarking vs Driving Innovation

*If you chase profit you will lose quality. If you seek quality you will find profit.*



# What's Lean?

*Toyota?*

*Going to gemba?*

*Value Stream Mapping?*

*Voice of the customer?*

*Elimination of waste?*



# What's Lean?

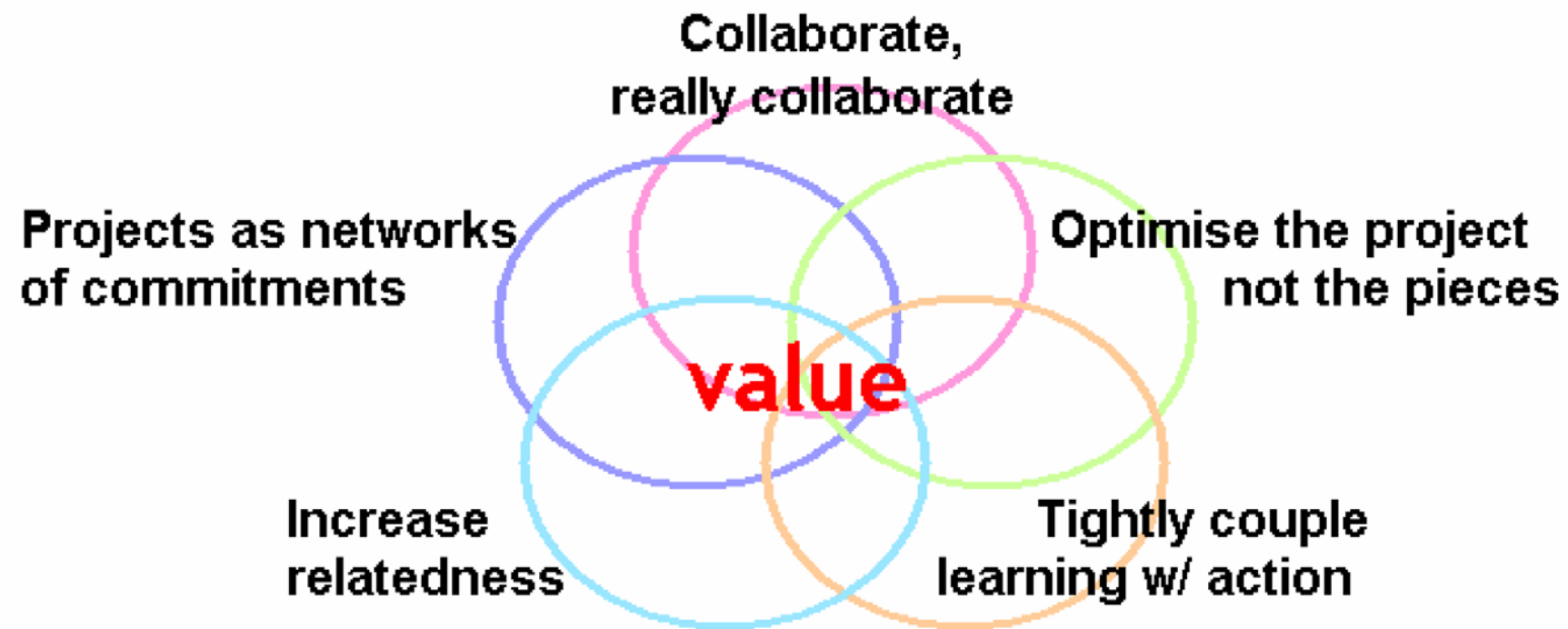


Figure 1: The Five Big Ideas





## What's Lean?

*You should submit wisdom to the company.*

*If you don't have any wisdom to contribute, submit sweat.*

*If nothing else, work hard and don't sleep.*

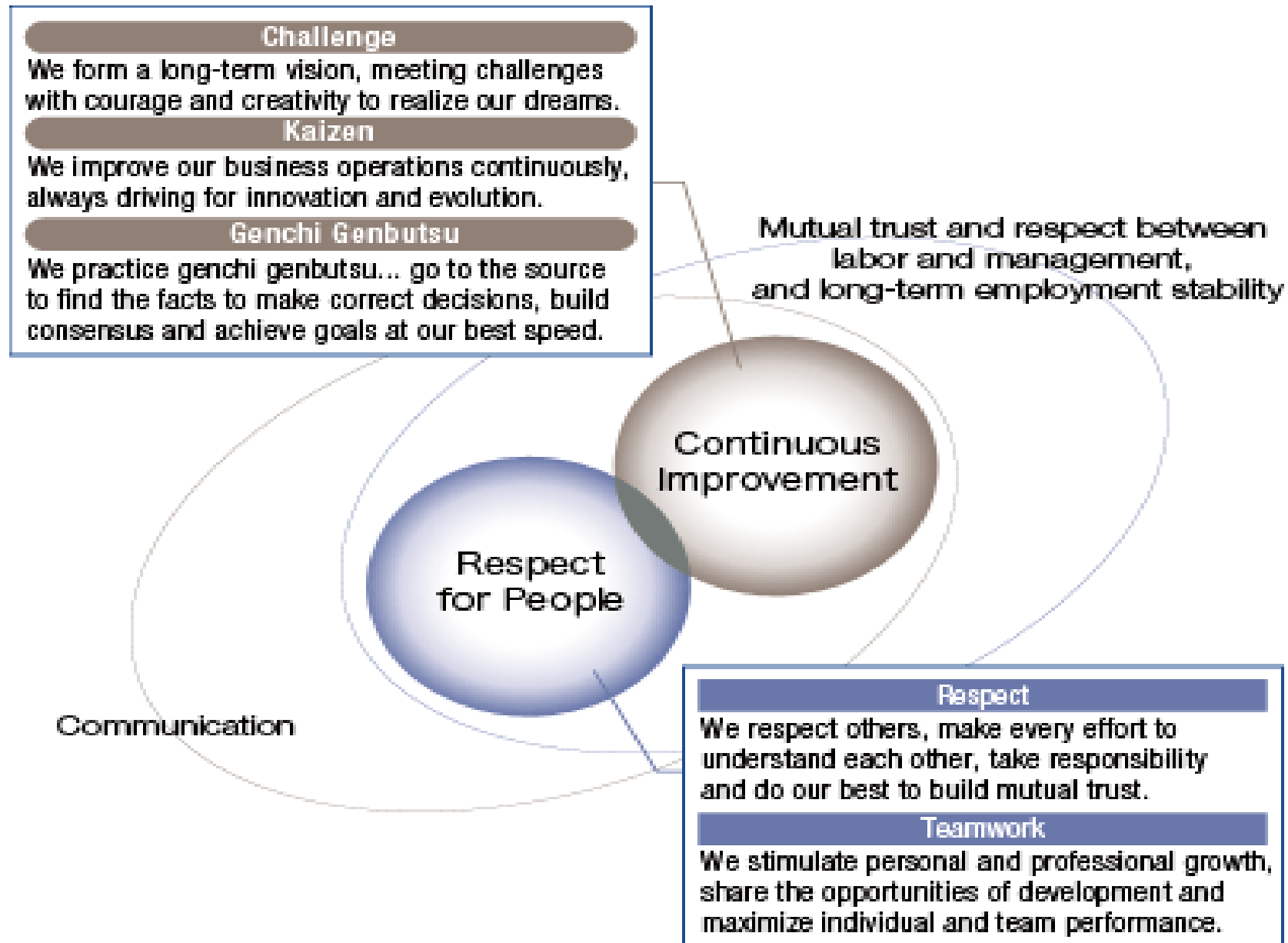
*Or resign.*

--Taiichi Ohno



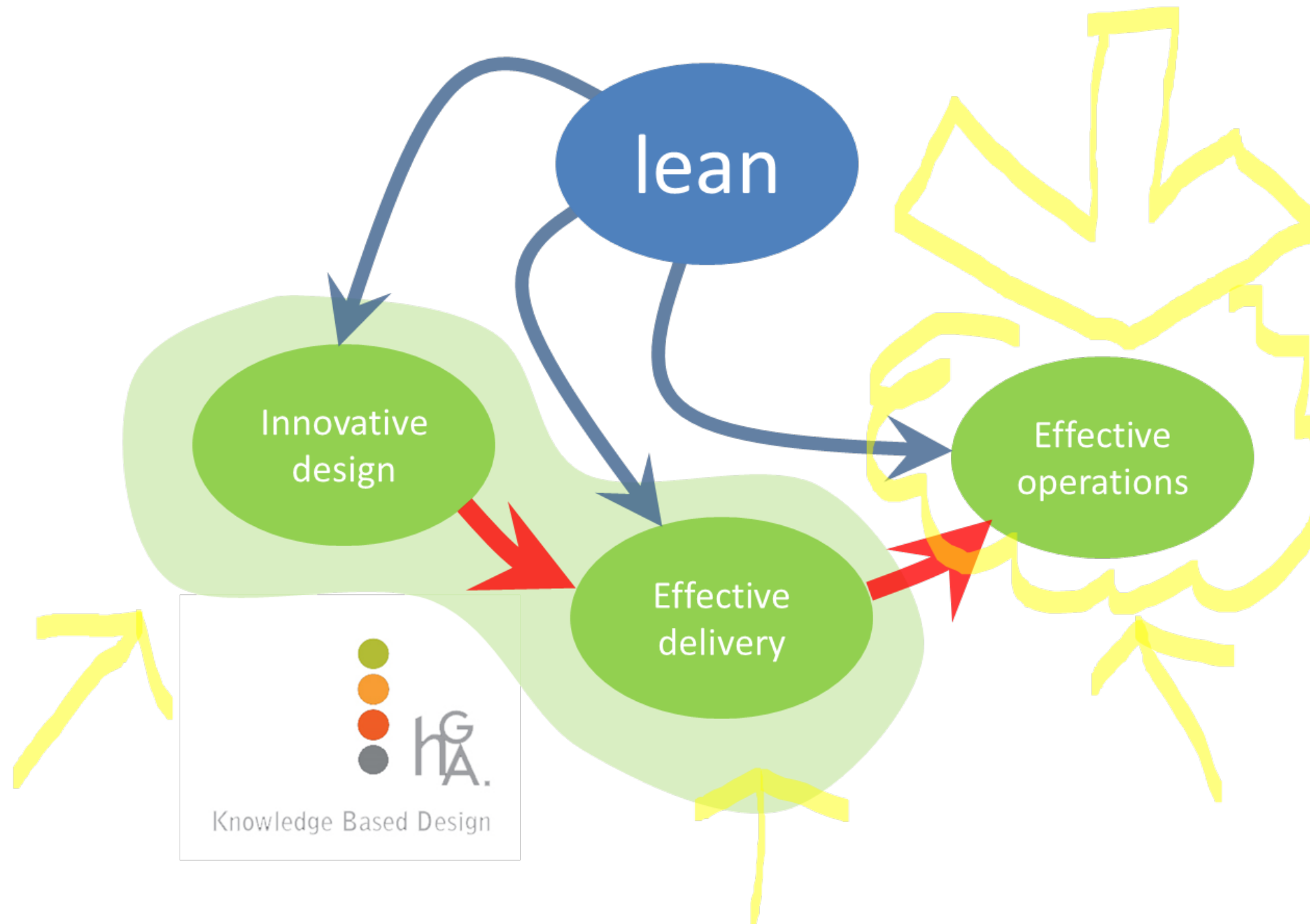


a philosophy  
and a system  
supported by  
simple tools.





# And in our world?



# Today's Pillars

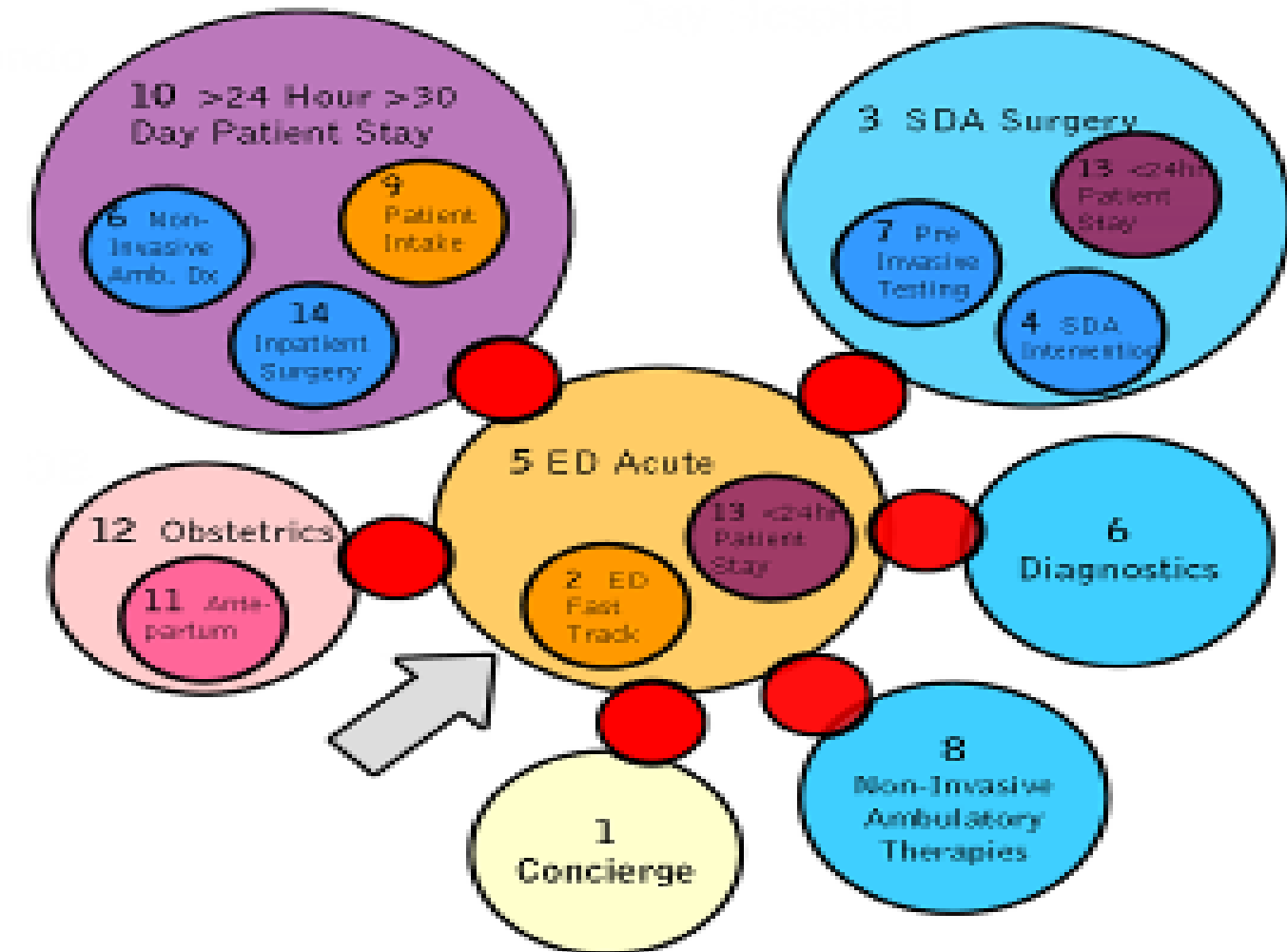
**Integrated Lean Project Delivery**

**Lean Production  
Management**

**Lean Design**

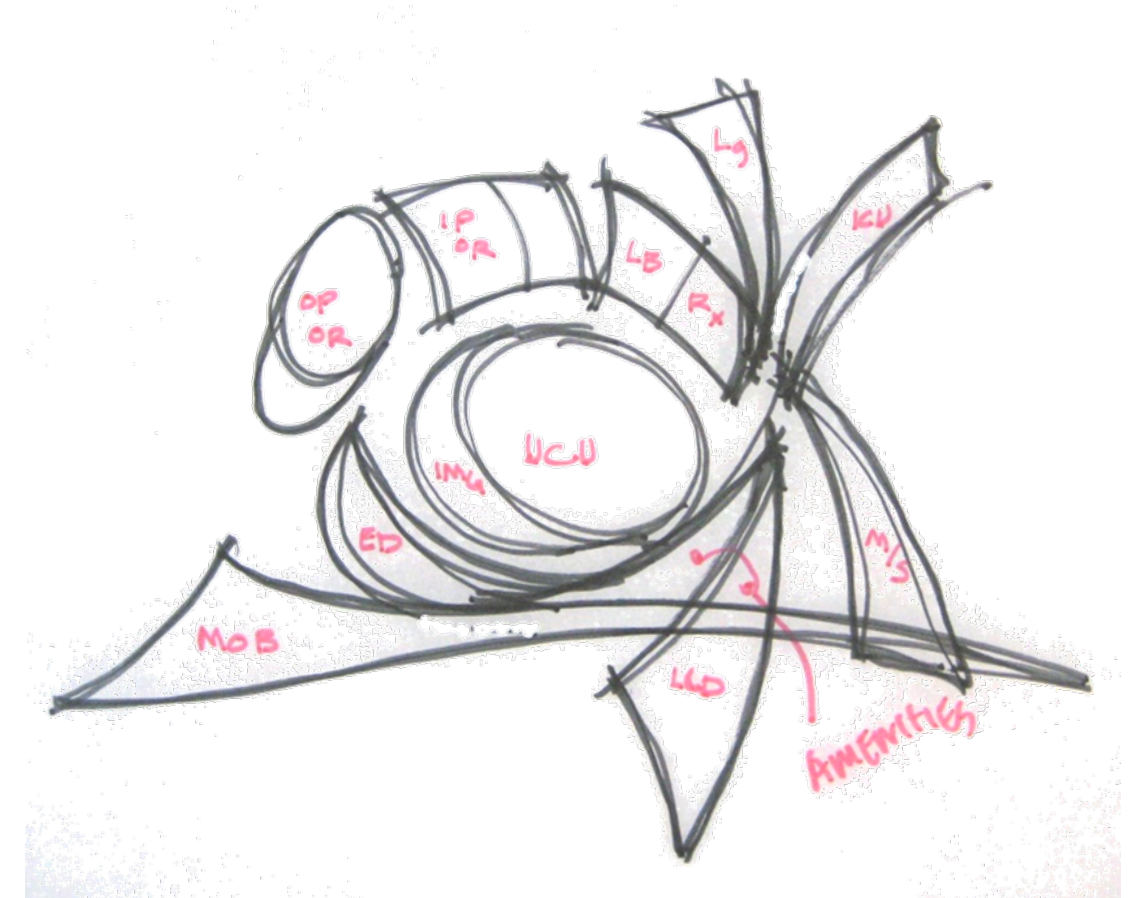


Transactional (manufacturing) lean is...  
a recipe, we've done it before and have to  
do it again and again, the value is in  
removing obstacles to what the customer  
really wants.



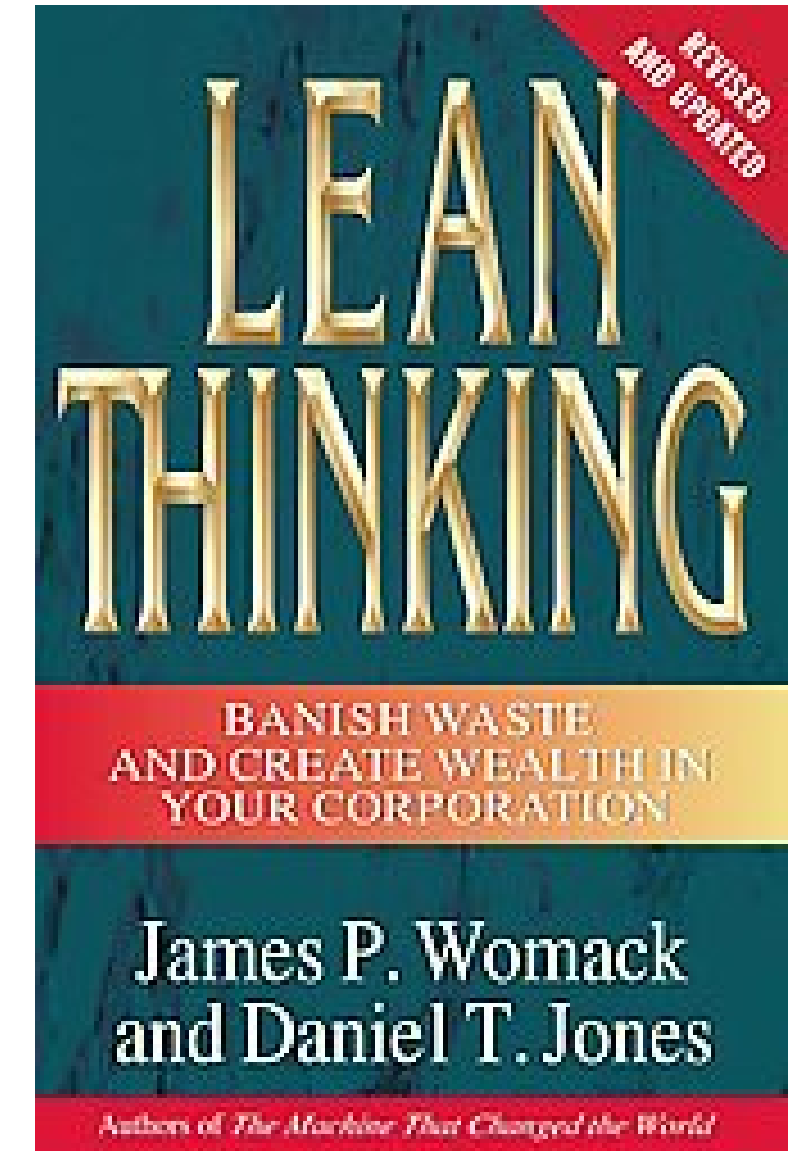


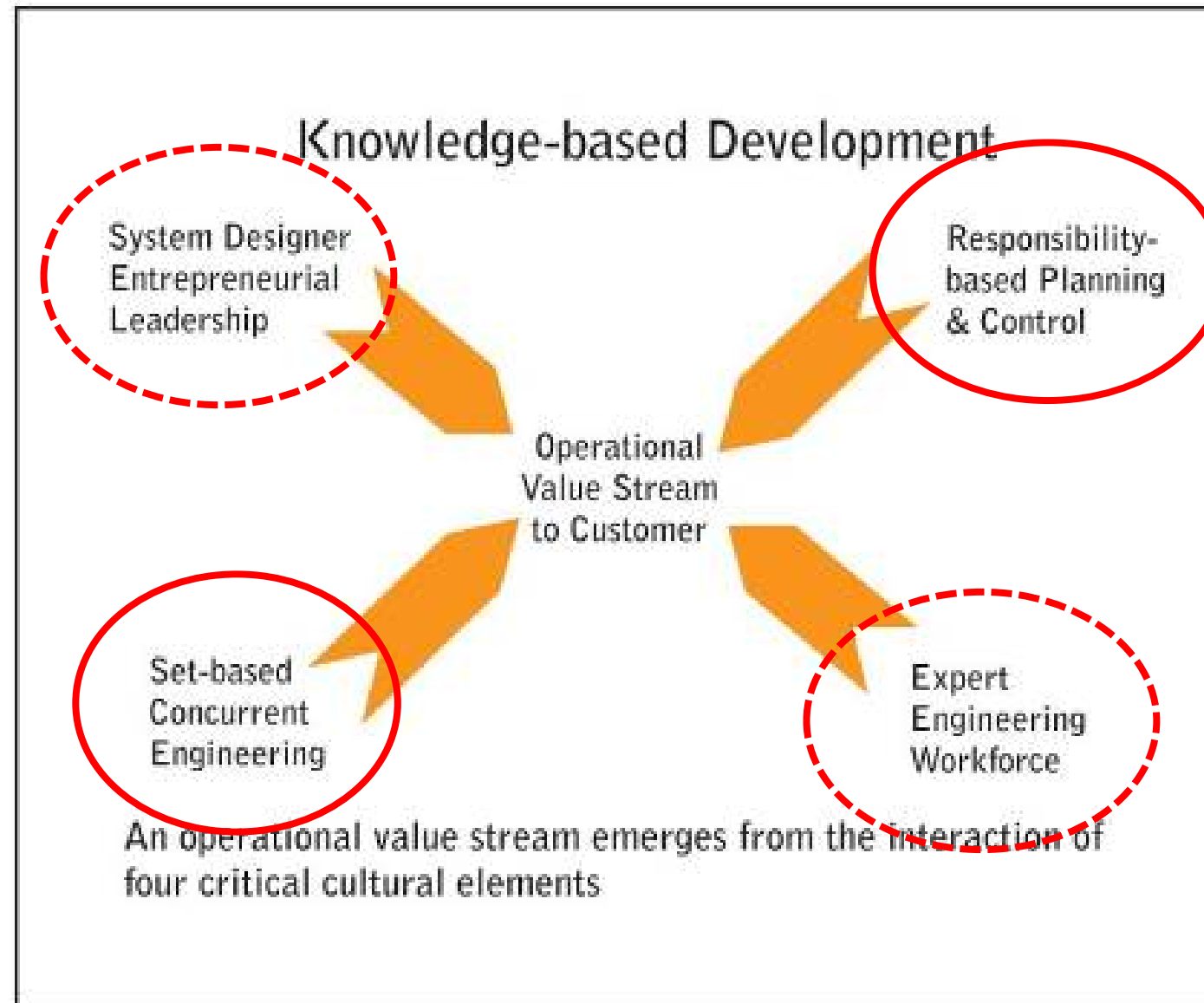
- Knowledge-based design is...
  - Creativity, ideas, innovative, entrepreneurial solutions matched to what the customer might not even know they need
    - Process – Many alternatives from many perspectives
    - Workforce – Individual excellence and responsibility
    - Leadership – Technical and coaching in nature
    - Planning and control – Based on flexible results



# Lean Manufacturing:

- Specify value from the standpoint of end customer
- Identify the value stream for each product family
- Make the product flow
- So the customer can pull
- As you manage toward perfection



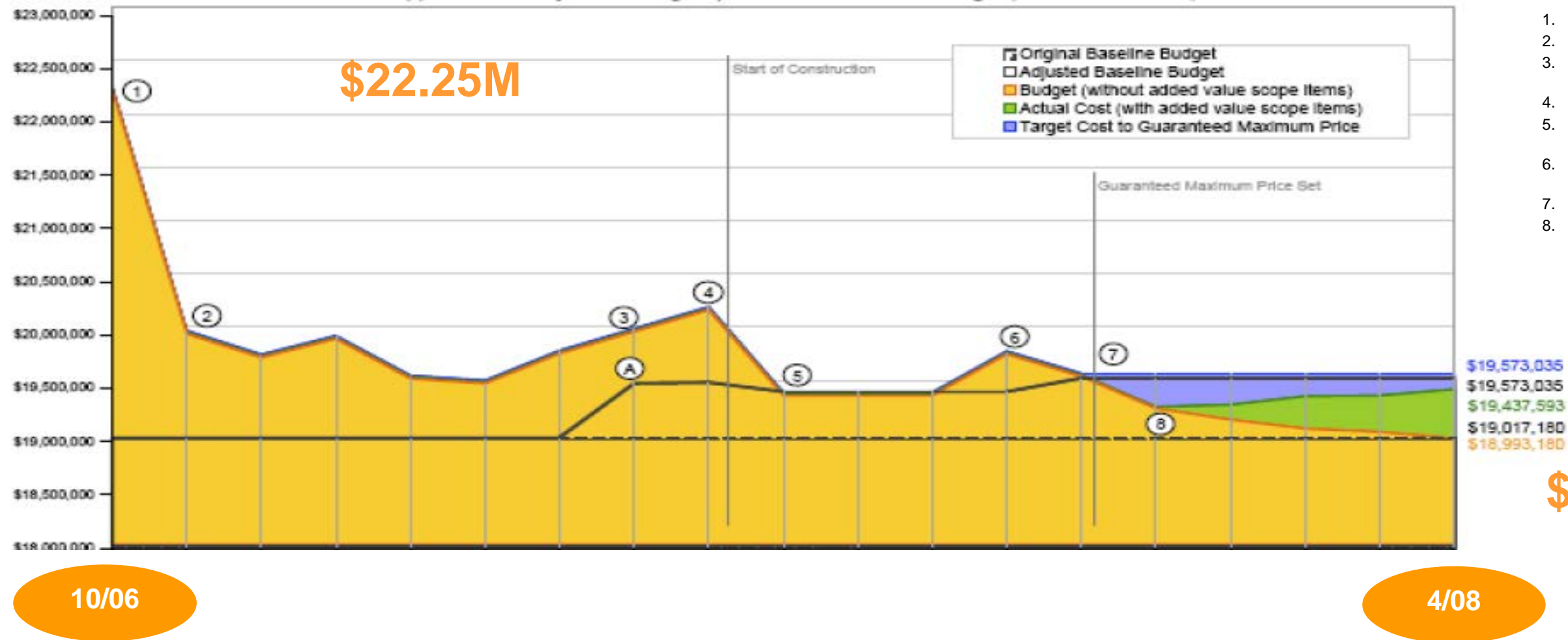




Early Returns.



# Sutter Fairfield Medical Office Building



**\$19.57M**





# SUTTER HEALTH

## A Very Big Challenge

Increase Throughput  
by 50%  
~~52~~

Reduce FTE's  
by 40%  
~~42~~

Reduce Square Feet  
by 30%  
~~35~~

Reduce Time to Build  
by 50%  
~~53~~

Reduce Natural Resource Use  
by 25%  
~~28~~



1/27/2009

## TARGET VALUE DESIGN TEAMS

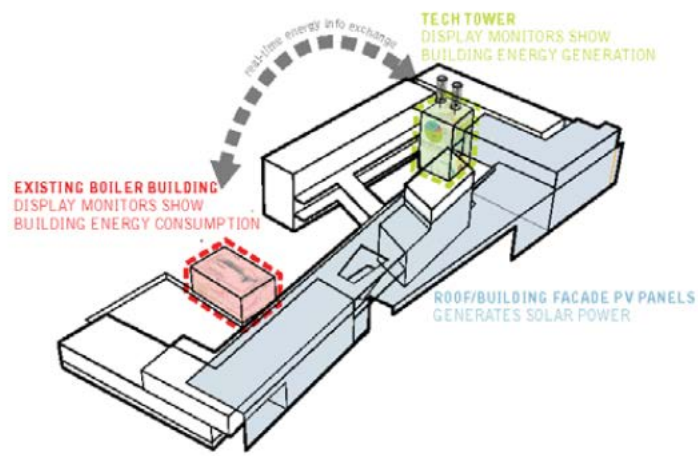
	1 Patient Management I	2 Patient Management II	3 Staff Efficiency	4 IT/Logistics	5 Cost/Schedule	6 Building Systems/Site	7 Security
XO:	Catherine Knox (XO)	Scott Wing (XO)	Evelyn Warner (XO)	Tom Hoerstrman (XO)	Dave Wells (XO)	John Paul Peterson (XO)	Vinson Johnson (XO)
AO:	Jesse Springer (AO)	Cindi Ricker (AO)	Dalton LaVoie (AO)	Kevin Parks (AO)	Steven Powell (AO)	Arnie Dun (AO)	Arun Kaiwar (AO)
Design	Jesse Springer (AO) Paul Nagashima Sheila Ruder	Scott Wing (XO) Claudia Latchman	Evelyn Warner (XO) Dalton LaVoie (AO) Jeff Goodale	Tom Hoerstrman (XO) Kevin Parks (AO) Neil Cristal	Mike Godfrey Sing-Sing Lee (AO)	John Paul Peterson (XO) Ron Migliori Kathy Blume Gary Lai	Vinson Johnson (XO) Arun Kaiwar (AO) Bill Valentine
Construction	Bart Robeson	Jeff Wellenstein	(OPS Cost)	Brett Nogelberg	Dave Wells (XO) Craig Greenough Erik Winje	Dave Mitchell Tim Belie	Brian Hill
JV	Sina Yerushalmi	Jason Haim	Ken Lee	Steve Keeter	Jeff Rock Sean Luong Brad Jayne	Bob Levine Greg Stirewalt Arnie Dun (AO)	Dave Michaels Steve Carter
Operators	Catherine Knox (XO) Wendy Still Andrew Swanson Helen Byrd Jim Lett Laura Lycan Sharon LaMar	Cindi Ricker (AO) Chuck Spirk Fountain Hutchison Frances Riddlehoover	Maunani Henry Kim Waits Debbie Hoffman Chris Salmon Patti Crome	Dave Noronha Kathy Page Jerride Evans Mike Holston Gene Lucas Joe Sargent Steve Young John Rogel	Susan Lew Steven Powell (AO)	Michael Bean	Tom Felker Marty Aroian IT: Fred Eichstaedt
Team Resources	CEQA-Traci Michel Kerry Hughes William Roush	CEQA-Martin Tuttle John O'Shaughnessy Dennis Himing	CEQA-Wendy Saunders	CEQA-Todd Chambers	CEQA-Todd Chambers Lauren Trevathan Eric Tjai Dave Redemski Kaushal Diwan	CEQA-Laura Sainz Jim Townsend Larry Summerfield	Steve Keeter Dave Parrish Norm Carlson Don Price Betti Sadler Lisa Meints
Support Person	Steve Morton	Pamela Adams	Andie Moeder	Edgar Nunnelly	Mitch Vaden	None	Clarinda Bisceglia

## Program Cost Model Comparisons

	Dec '08 Cost Model 7 Sites	Mar '09 Cost Model - 7 Sites	Mar '09 Cost Model - 6 Sites
<b>Direct Facility Design/Build Costs</b>			
Typical Facility	\$2,620,113,411	\$2,077,070,440	\$1,873,912,888
Type 1 Facility	\$801,158,438	\$672,719,016	\$681,826,604
Type 5 Facility	\$858,824,328	\$718,079,294	\$728,412,634
<b>Total Facility Design/Build Costs</b>	<b>\$4,280,096,177</b>	<b>\$3,467,868,750</b>	<b>\$3,284,152,126</b>
<b>Equipment and IT</b>			
Owner Furnished Equipment	\$227,279,190	\$250,007,111	\$228,050,832
CPR IT Program Costs	\$198,450,000	\$222,760,650	\$209,441,104
<b>Subtotal Equipment and IT</b>	<b>\$425,729,190</b>	<b>\$472,767,761</b>	<b>\$437,491,936</b>
<b>Subtotal Facility Direct Costs</b>	<b>\$4,705,825,367</b>	<b>\$3,940,636,511</b>	<b>\$3,721,644,062</b>
<b>Indirect Costs</b>			
Escalation	\$350,407,776	\$98,753,905	\$75,532,711
Program Contingency	\$500,582,537	\$394,063,651	\$372,164,406
Investment Sustainability Fund	\$300,000,000	\$300,000,000	\$300,000,000
Offsite Infrastructure Allowance	\$343,697,754	\$343,697,754	\$314,459,720
CEQA Allowance	\$104,000,000	\$104,000,000	\$84,000,000
Site Adaptation Allowance	\$35,000,000	\$70,000,000	\$60,000,000
Fees and Permits Allowance	\$26,000,000	\$26,000,000	\$23,000,000
Programming, Planning, Administration	\$21,450,085	\$81,750,064	\$779,451,064
<b>Subtotal indirect Costs</b>	<b>\$2,781,138,152</b>	<b>\$2,155,965,375</b>	<b>\$2,088,606,901</b>
<b>TOTAL</b>	<b>\$7,486,963,519</b>	<b>\$6,096,601,886</b>	<b>\$5,810,250,963</b>

**\$7.5B**  
**\$6.1B**  
**\$5.1B**





## SCUP/AIA-CAE EXCELLENCE IN ARCHITECTURE

### Honor

[Harvard University](#) for Tozzer Anthropology Building with J  
Consulting Engineers, PC; Green International Affiliates, In  
Inc.; Cavanaugh Tocci Associates

### Honor

[Los Angeles Community College](#) for Los Angeles Harbor Col  
Construction; Saiful/Bouquet; JMC2; Fundament & Associat  
Consultancy; Aon Fire Protection Engineering Corp; Finish

### Honor

[Stanford University](#) for Windhover Contemplative Center w  
Rutherford + Chekene; BKF Engineers; Auerbach Glasow F  
Earth Works





## KBD CONNECTIONS TO HGA STRATEGIC PLAN

### 1 DISTINGUISH OURSELVES BY EXEMPLIFYING EXCELLENCE

- Improve design quality
- Advance integration of disciplines
- Cultivate our reputation

### 2 TAKE ADVANTAGE OF NEW MARKET OPPORTUNITIES

- Innovative clients and design
- Integrate A/E services

### 3 ORGANIZE AND MANAGE OUR FIRM EFFECTIVELY

- Responsibility and authority  
“closest to the action”
- Consistent problem-solving methodology and decision-making

### 4 PRACTICE STEWARDSHIP

- Culture of mentoring
- Sustainable design

### 5 FINANCIAL SUCCESS

- Accountability
- Enhance our competitive advantage



We did this right.



## EDUCATION SESSION 2

### WHERE WE'VE BEEN

Education Session 1:  
Project Team Organization

Your comments re: Session 1?

Architectural	Civil / Landscape	Structural	Mechanical
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○
○	○	○	○

### WHERE WE'RE GOING

Education Session 2:  
Integration Events and  
Questions?

## EDUCATION SESSION 3

### WHERE WE'VE BEEN

Education Session 2:

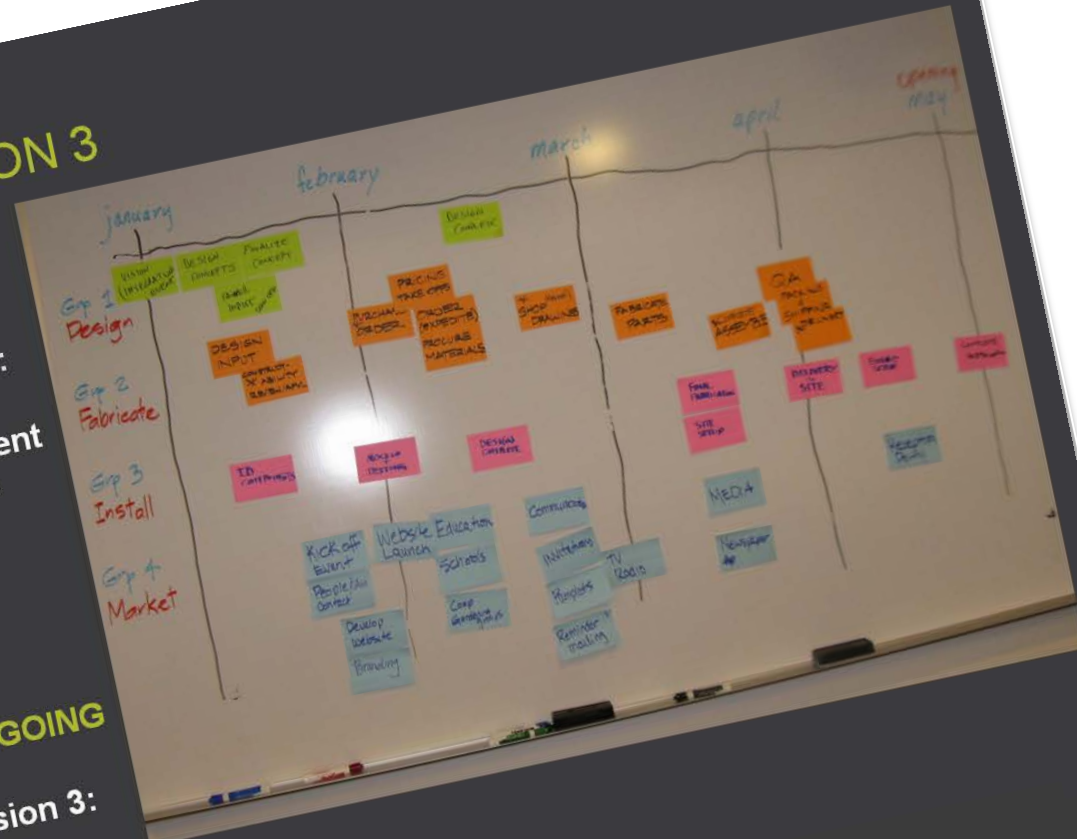
- Integration Event
- Pull Schedule

### WHERE WE'RE GOING

Education Session 3:

- Knowledge Sharing
- Set-Based Design

Questions?



- Computer
  - Local Disk (C:)
  - project (\\milwaukee\\milwaukee) (G:)
  - market (\\Milwaukee\_marketing\\Marketing) (K:)
  - project (\\losangeles) (L:)
  - Isstanc (\\losangeles\\author)
  - kbdlibrary (\\minneapolis) (O)
- 14-1006\_DD2
  - BIM Repository
  - Cross-Disciplinary Resources
  - HGAU
  - KBD Resources
    - A3
    - BIM Capabilities
    - BRH Temp 2013 01 24 Satosl
    - KBD Case Studies
    - KBD Education
      - KBD Staff Training 2010
        - PowerPoints - Education S
        - Staff Training
        - Training Session Photos
        - Training Workbook
        - Knutson TVC 2013
        - MSP ASHE 2012
        - Overview Sessions
        - Pharmacy Benchmarking (2012)
      - KBD Equipping
      - KBD HiP Page
      - Pull Schedule
      - Newforma
      - Practice Group Resources



## College of Saint Benedict New Academic Building ST JOSEPH, MINNESOTA

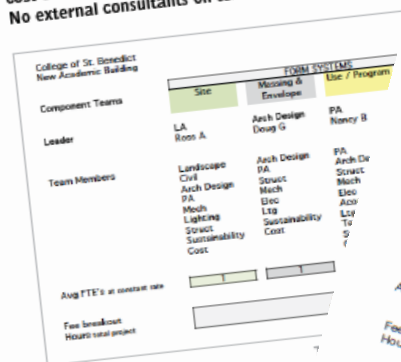
### PROJECT SUMMARY

New academic building for CSB housing departments of psychology, mathematics, economics and computer science.

- 110,000 GSF
- 15.5 acres of sitework
- \$41.5 million construction budget
- LEED Platinum or better
- CSB goals for project:
  - Provide the highest quality formal and informal learning spaces for students and faculty
  - Enhance the campus as a whole and connect the community together
  - Set a standard for sustainability and stewardship for the CSB community
- Vision for the use of KBD on the project:
  - Make well-informed integrated design decisions early in the project
  - Engage all disciplines as conceptual thinkers
  - Develop cost/benefit scenarios to assist Owner in decision making
  - Maintain flexibility in the design process so new information can be applied with minimal disruption

### TEAM ORGANIZATION

Component Teams were structured around significant building components. The Owner had periodic involvement, by choice (not able to commit time and resources needed for highly participative participation). Contractor was not selected as of completion of SD Phase, so construction was represented by HGA cost estimating. Advised Owner to engage CM for DD P. No external consultants on team.



The Component Team structure he value engineering early in Scherr on the team was engaged in the first day of the project. Early to Predesign team to all team m perspective. Key team mem mechanical, electrical and day participated in meetings with the knowledge of how the design of their system to the College's needs. This multidisciplinary process



HGA Architects and Engineers

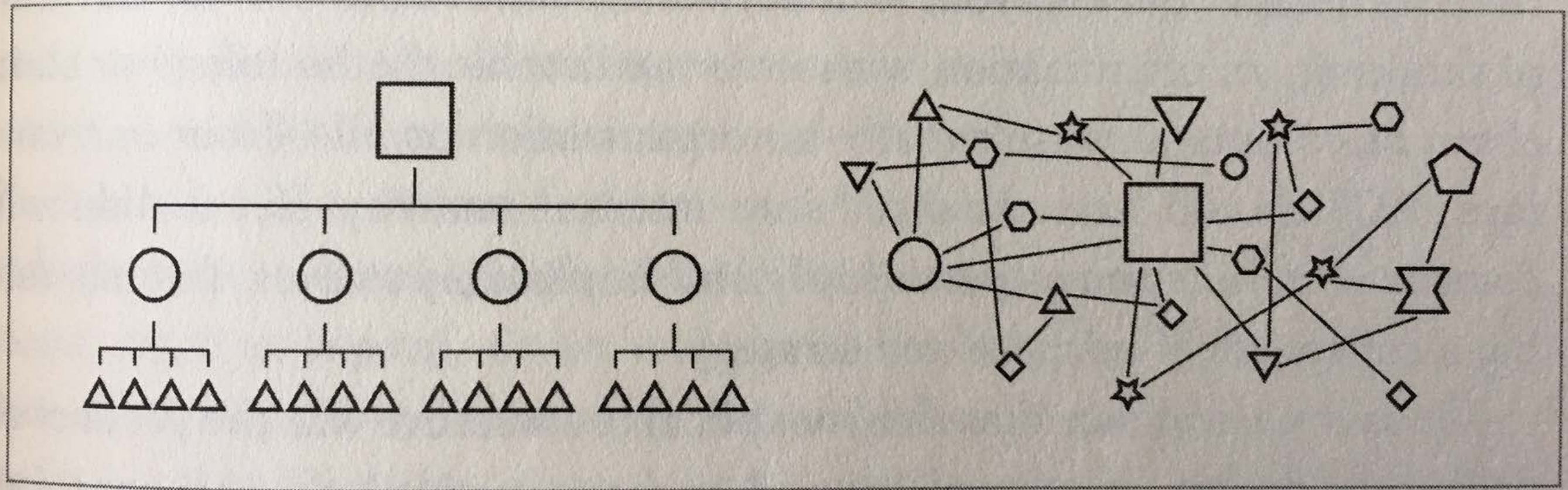
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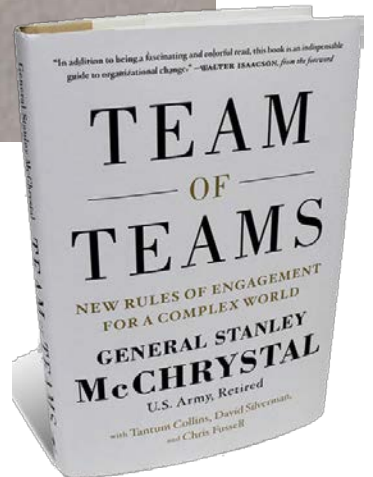
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<div> <div>⌵</div> <div>📁 KBD Resources</div> <div>⌵</div> <div>📁 A3</div> <div>&gt;</div> <div>📁 A3 Examples</div> <div>⌵</div> <div>📁 A3 Project</div> <div>⌵</div> <div>📁 A3_0476-069-00_State of MN-Replace Fans-Judicial Center</div> <div>📁 A3-001 Fan Options</div> <div>📁 Template</div> <div>📁 A3_0675-532-00_Mayo-TGS Inpatient Unit Relocation-Fr4</div> <div>📁 A3_1192-060-00_Emerson-SHAK-Predesign Study</div> <div>&gt;</div> <div>📁 A3_1310-062-00_Froedtert-3NT ICU</div> <div>&gt;</div> <div>📁 A3_1310-063-00_Froedtert-ED Phase 2</div> <div>📁 A3_1315-020-00_NRG-Ext of NRG District Steam Heat Syst</div> <div>📁 A3_1735-102-00_ETMC-Tyler Life Safety Plan Update 2011</div> <div>📁 A3_1882-045-00_Aurora-84th St Clinic-Design To Budget P</div> <div>📁 A3_1923-026-01_Mortenson-Design Build-Kohl's EFC-5-Basi</div> <div>📁 A3_2019-009-00_Cushman and Wakefield-Pacific Ethanol Work</div> <div>&gt;</div> <div>📁 A3_2085-047-00_Sutter Elk Grove Prototype Hospital</div> <div>📁 A3_2085-050-00_Sutter Auburn Faith-Surgery Renovation</div> <div>&gt;</div> <div>📁 A3_2085-061-00_Sutter Santa Rosa Replacement Hospital</div> <div>📁 A3_2085-090-00_Sutter Health-ROS-Infusion Center Expans</div> <div>&gt;</div> <div>📁 A3_2085-090-01_Sutter Health-ROS-Add Svc-Infusion Ctr</div> <div>&gt;</div> <div>📁 A3_2085-094-01_Sutter Health-EPIC-Amador-Predesign</div> <div>📁 A3_2085-095-00_Sutter Health-Roseville-Strategic MP</div> <div>&gt;</div> <div>📁 A3_2085-120-00_Sutter Health-Shared Clinical Lab TI Exp</div> <div>&gt;</div> <div>📁 A3_2085-163-00_Sutter-Medical Foundation West Roseville</div> <div>📁 A3_2501-003-00_DeMaria Bldg Co-Fremont Comm Digester</div> <div>&gt;</div> <div>📁 A3_2501-004-00_DeMaria Bldg-VA Battle Creek Biomass Cog</div> <div>📁 A3_2566-004-05_Affinity HS-Cardiac Center-St Elizabeth's Hospital</div> <div>&gt;</div> <div>📁 A3_2566-005-00_Affinity HS-Emergency Department-St Elizabeth's Hospital</div> <div>📁 A3_2606-008-00_VA Union Water Distribution Replacement</div> </div>					<div> <div>⬆</div> <div> <div>Name</div> <div>Date modified</div> <div>Type</div> <div>Size</div> </div> <div> <div>📄</div> <div>A3-001 Fan Options.docx</div> <div>9/19/2014 5:42 AM</div> <div>Microsoft Word Doc...</div> <div>1,526 KB</div> </div> <div> <div>📄</div> <div>A3-001 Fan Options.pdf</div> <div>9/19/2014 5:42 AM</div> <div>Adobe Acrobat Docu...</div> <div>134 KB</div> </div> <div> <div>📄</div> <div>basE.pdf</div> <div>9/17/2014 11:58 AM</div> <div>Adobe Acrobat Docu...</div> <div>13,019 KB</div> </div> <div> <div>📄</div> <div>Centrifical.pdf</div> <div>9/17/2014 2:48 PM</div> <div>Adobe Acrobat Docu...</div> <div>13,031 KB</div> </div> <div> <div>📄</div> <div>Fan Wall.pdf</div> <div>9/17/2014 2:48 PM</div> <div>Adobe Acrobat Docu...</div> <div>13,038 KB</div> </div> <div> <div>📄</div> <div>VRV Selection Calcs 9-3-14.pdf</div> <div>9/17/2014 1:35 PM</div> <div>Adobe Acrobat Docu...</div> <div>59 KB</div> </div> </div>				

It was the best!



What we were designed for

What we were facing





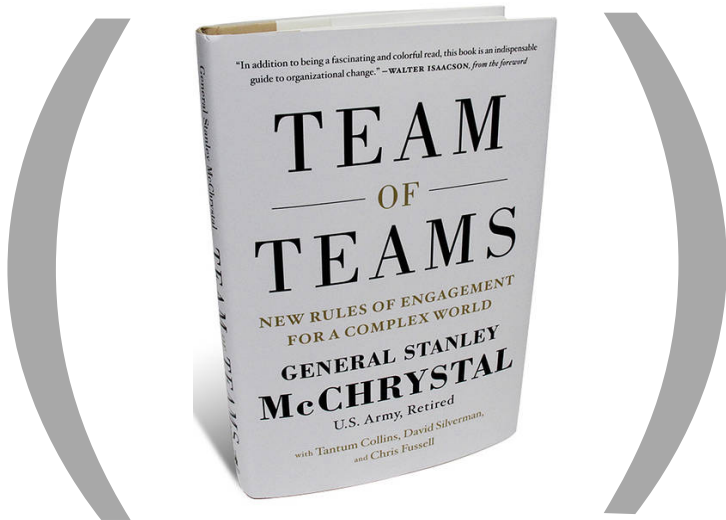
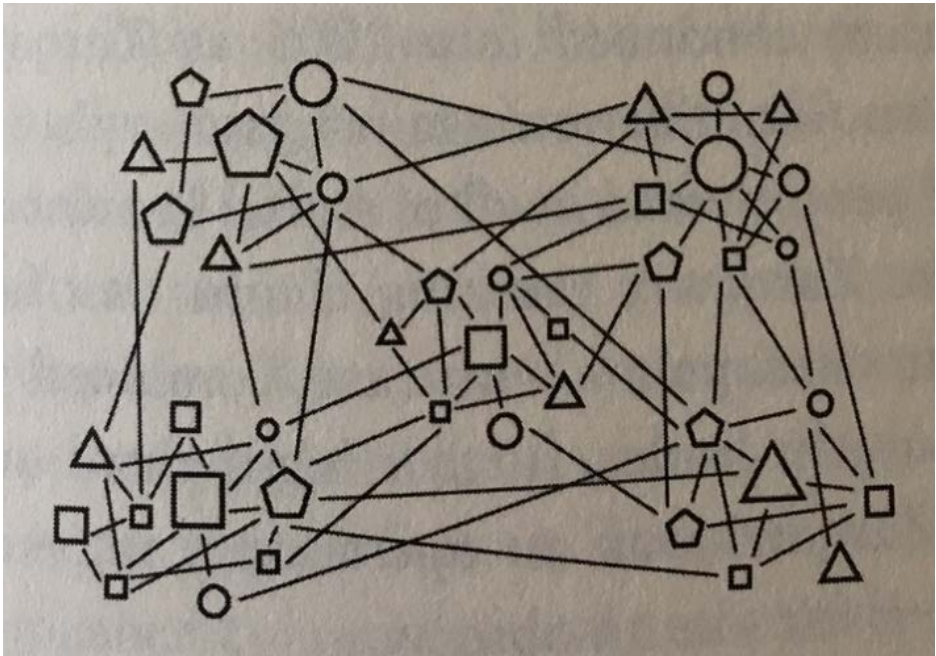
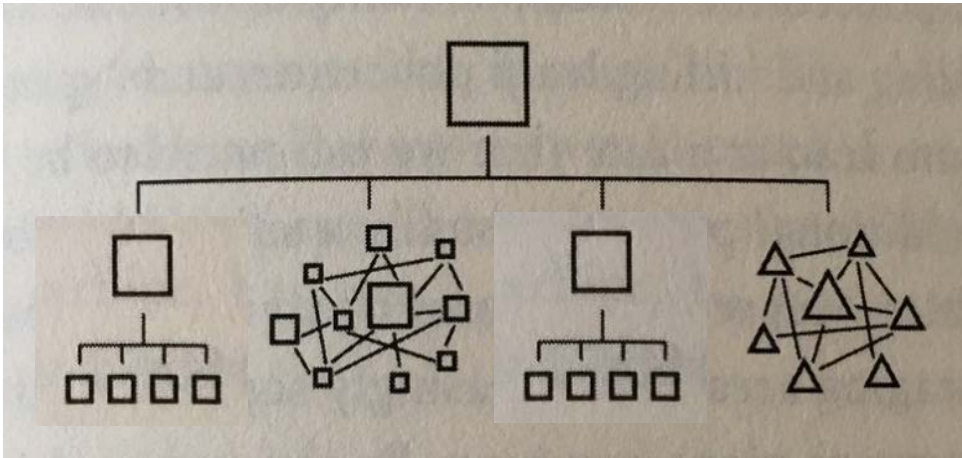
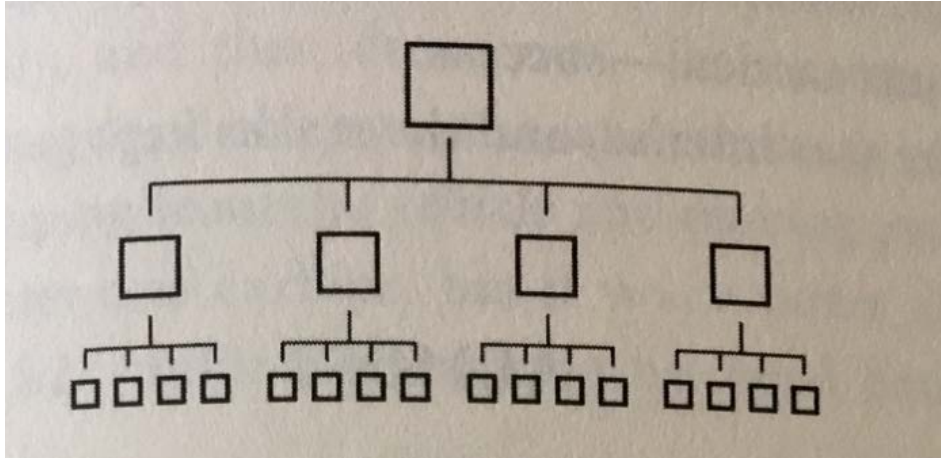


Complicated



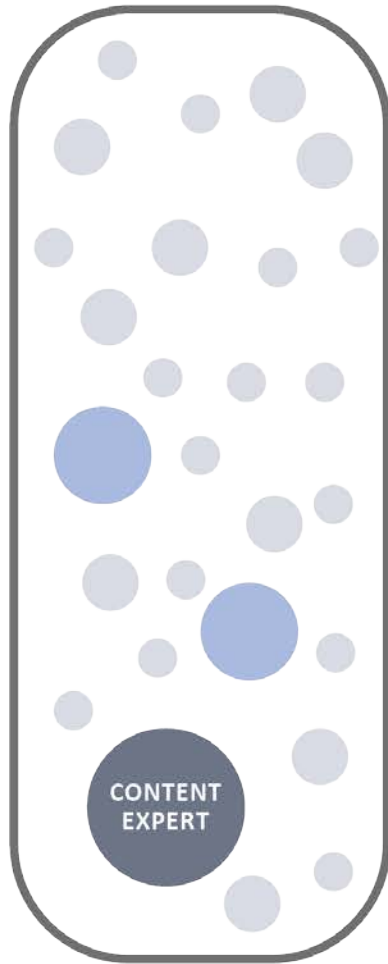
Complex





PRACTICE GROUP

**A**



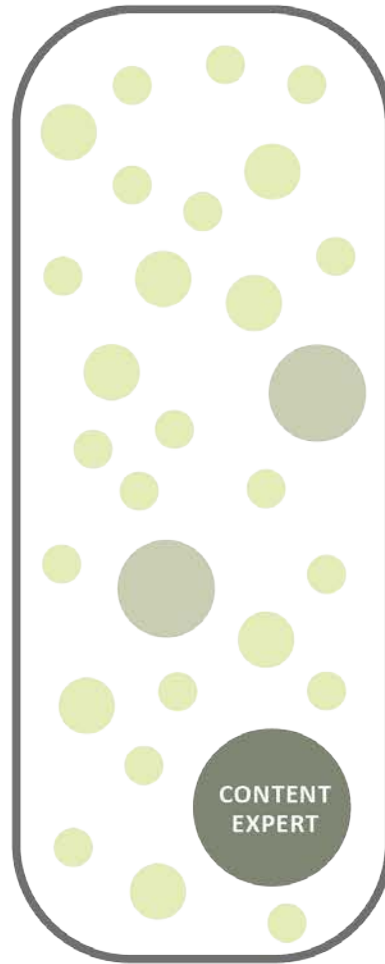
PRACTICE GROUP

**B**



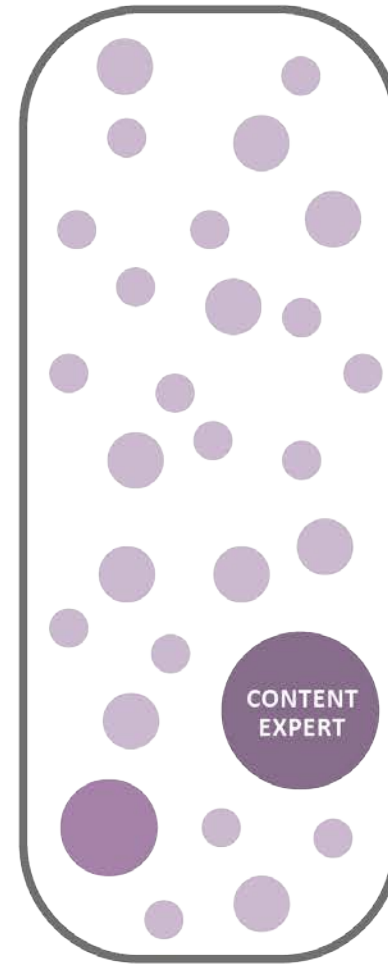
PRACTICE GROUP

**C**



PRACTICE GROUP

**D**



PRACTICE GROUP

**A**

PRACTICE GROUP

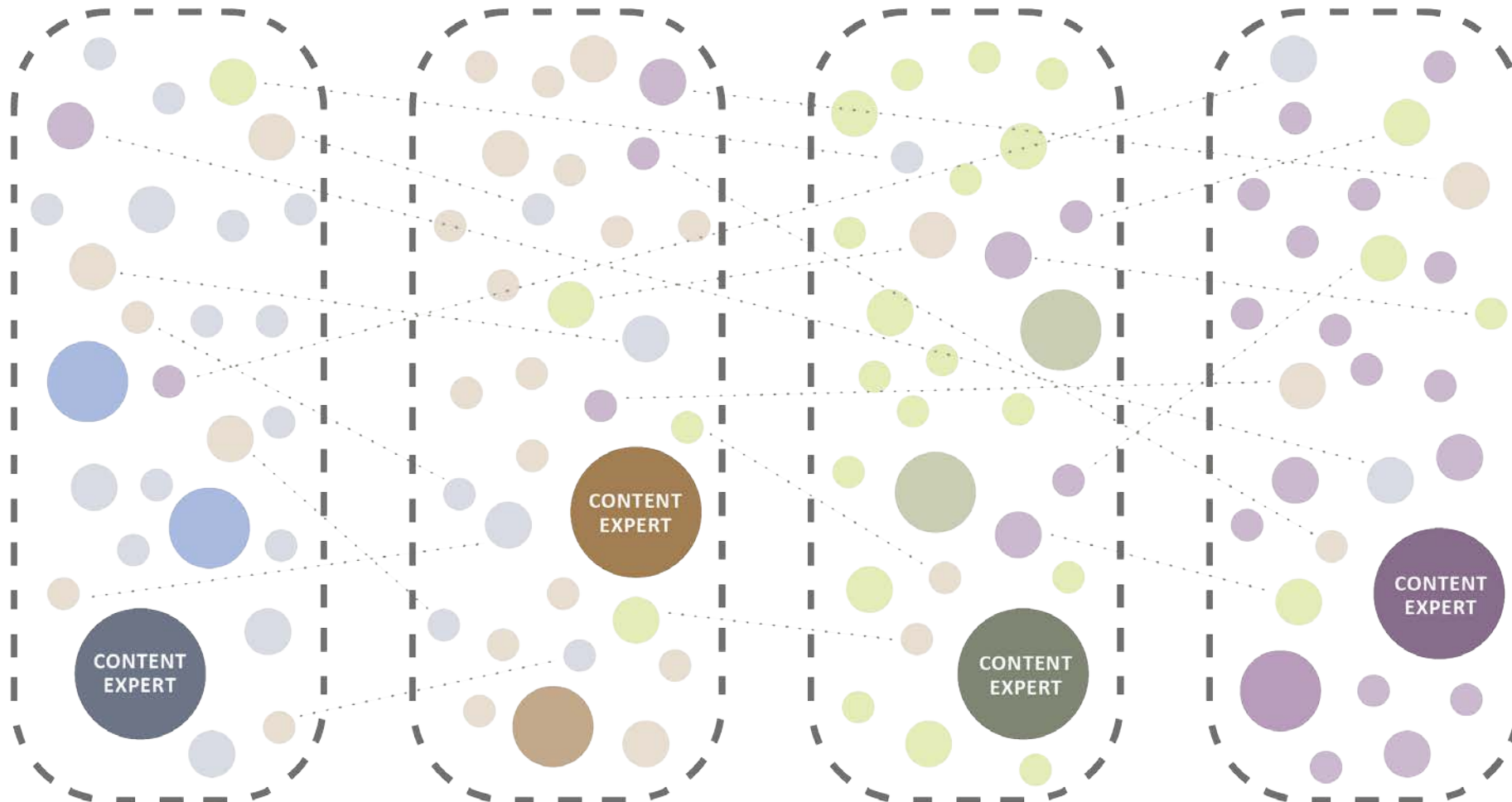
**B**

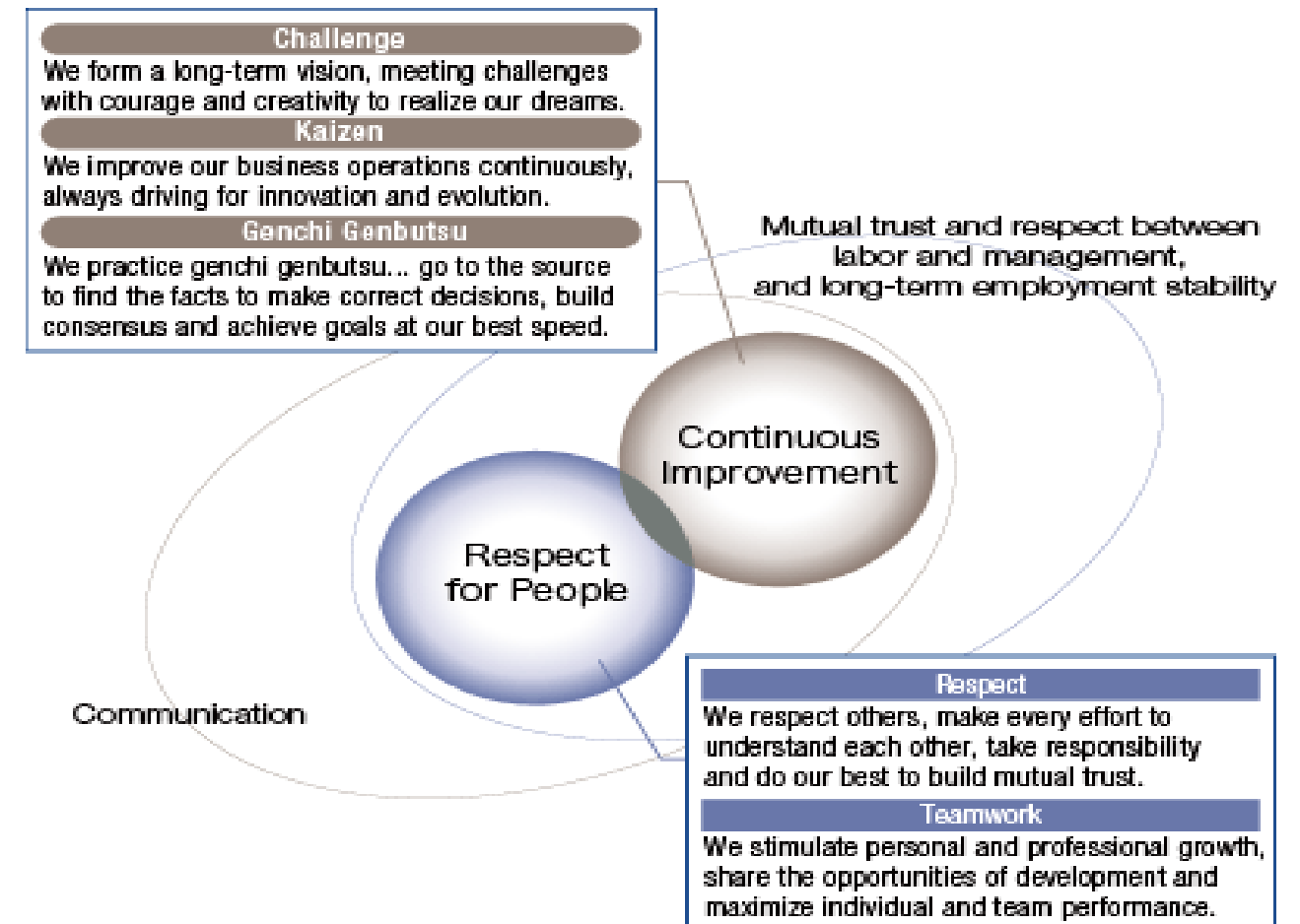
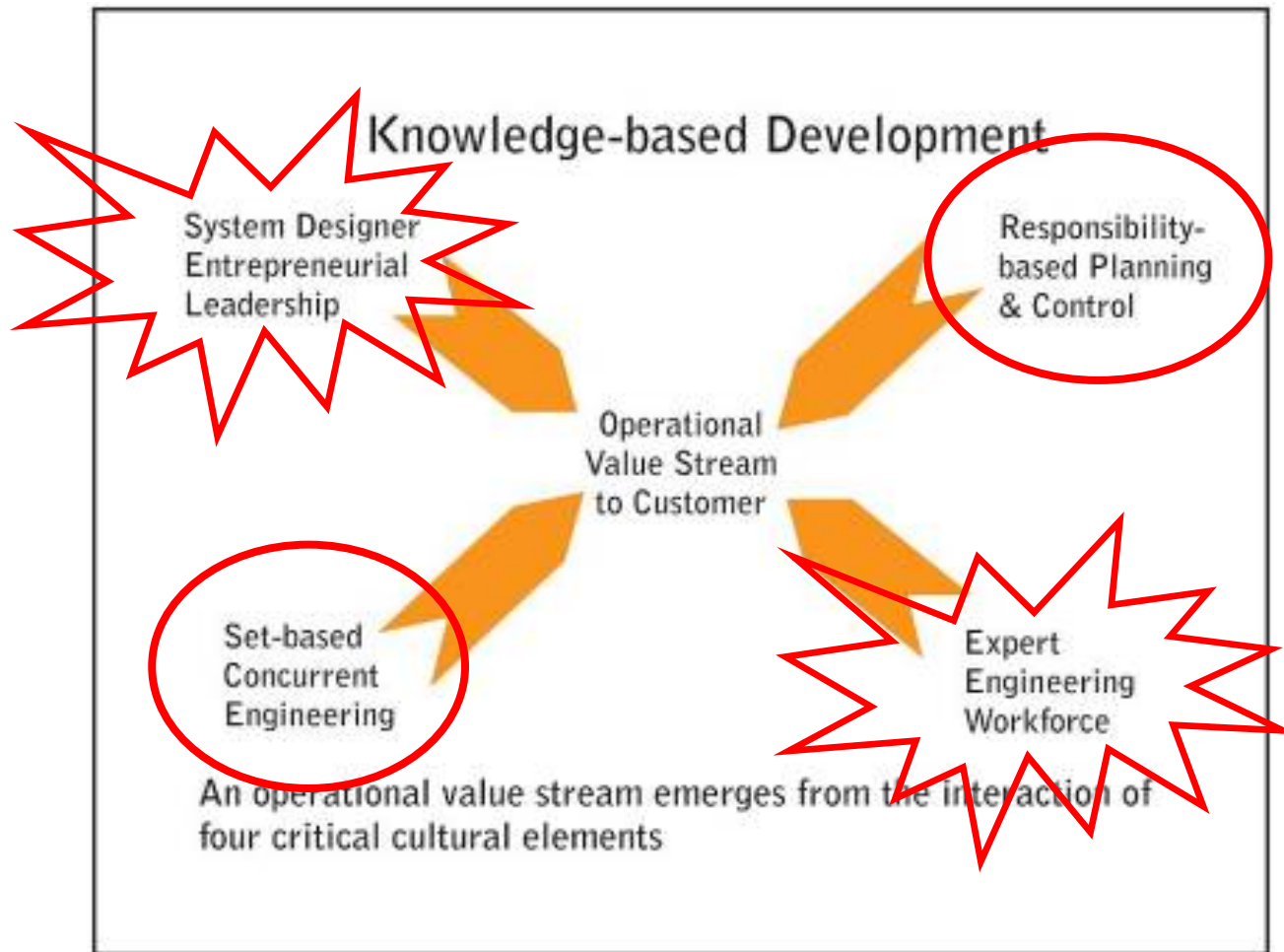
PRACTICE GROUP

**C**

PRACTICE GROUP

**D**







# Leadership styles

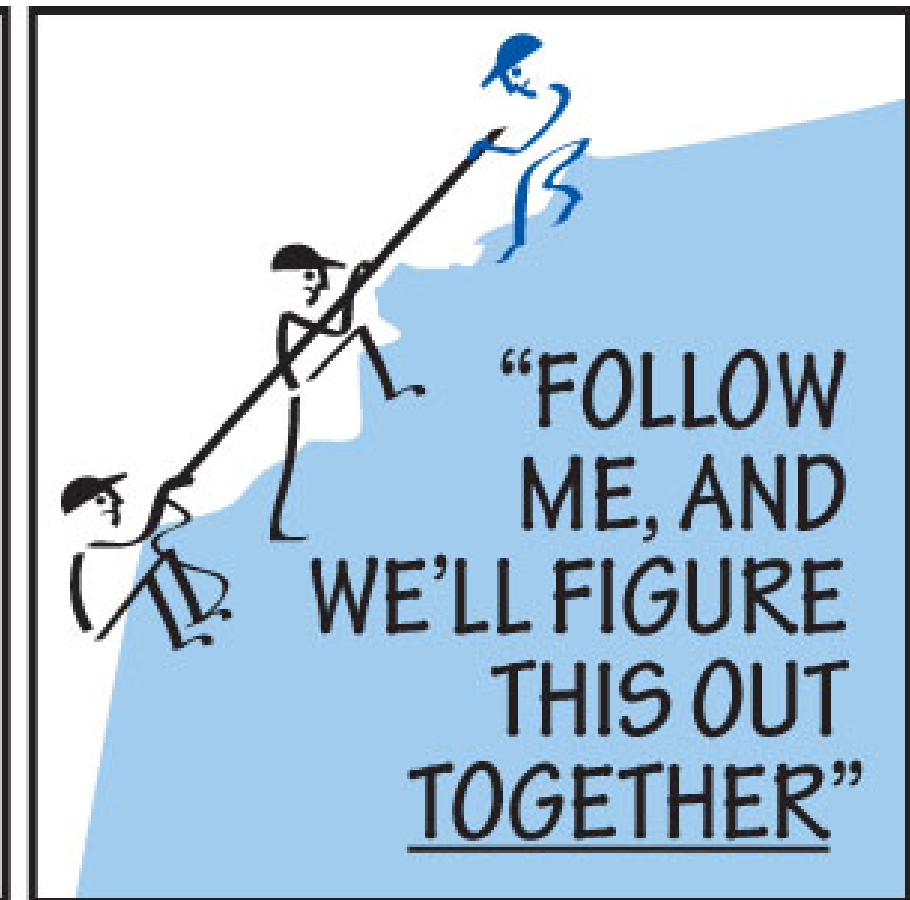
Old Dictator Style



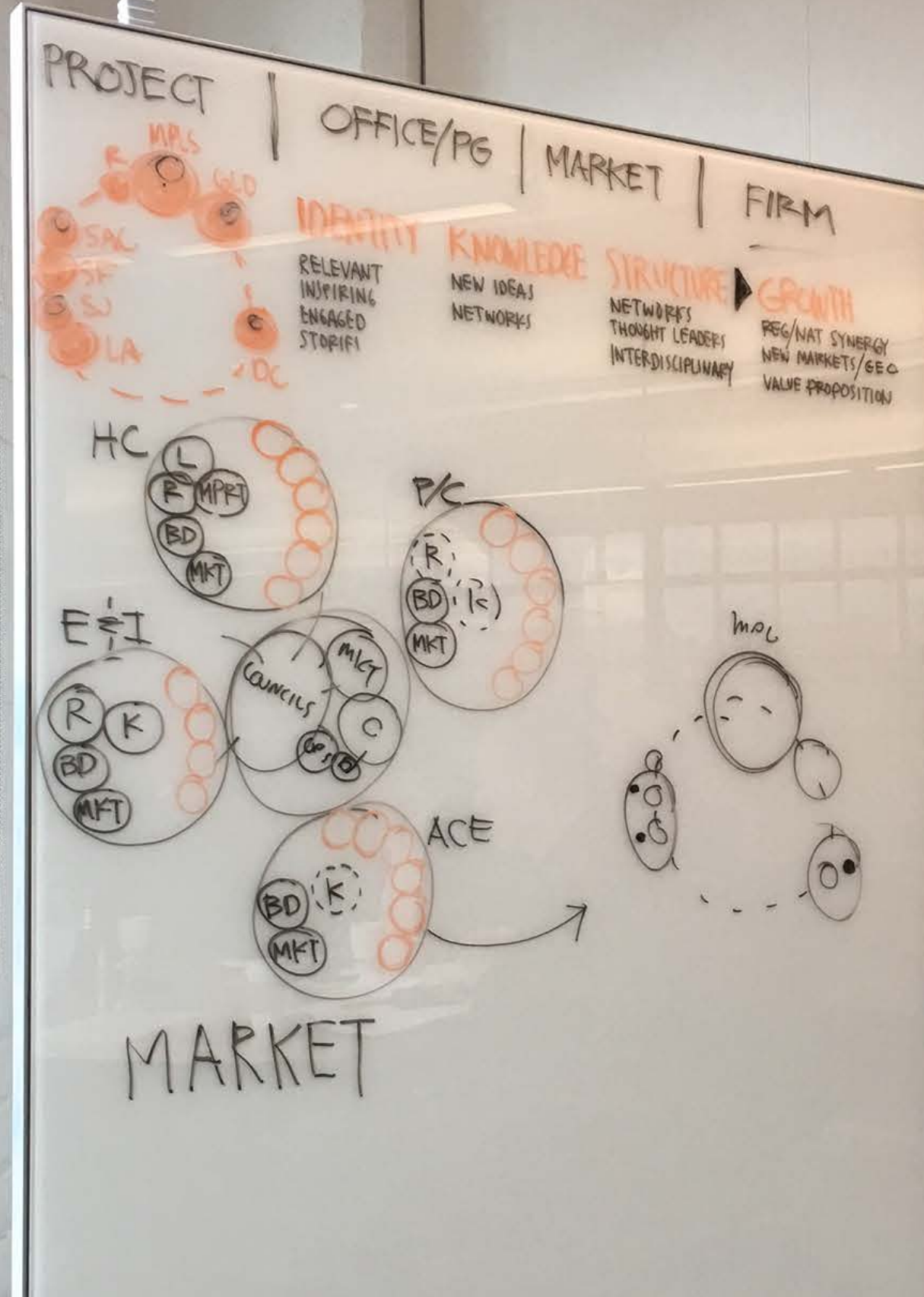
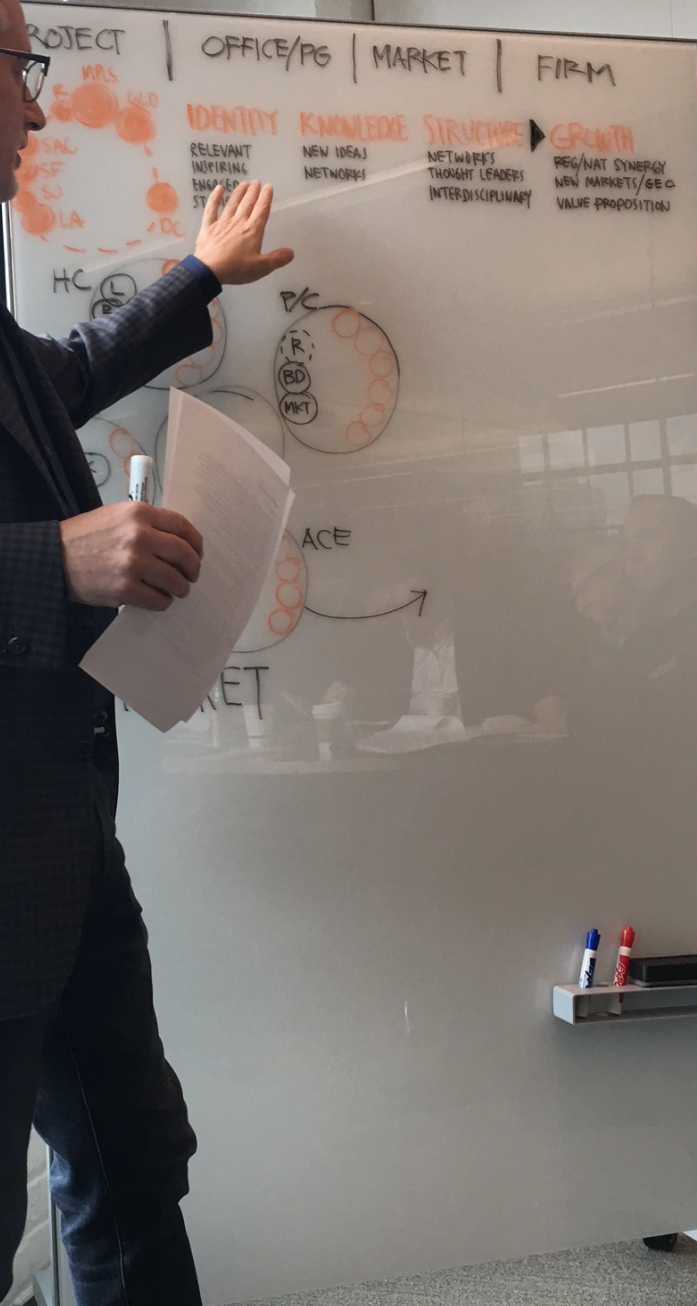
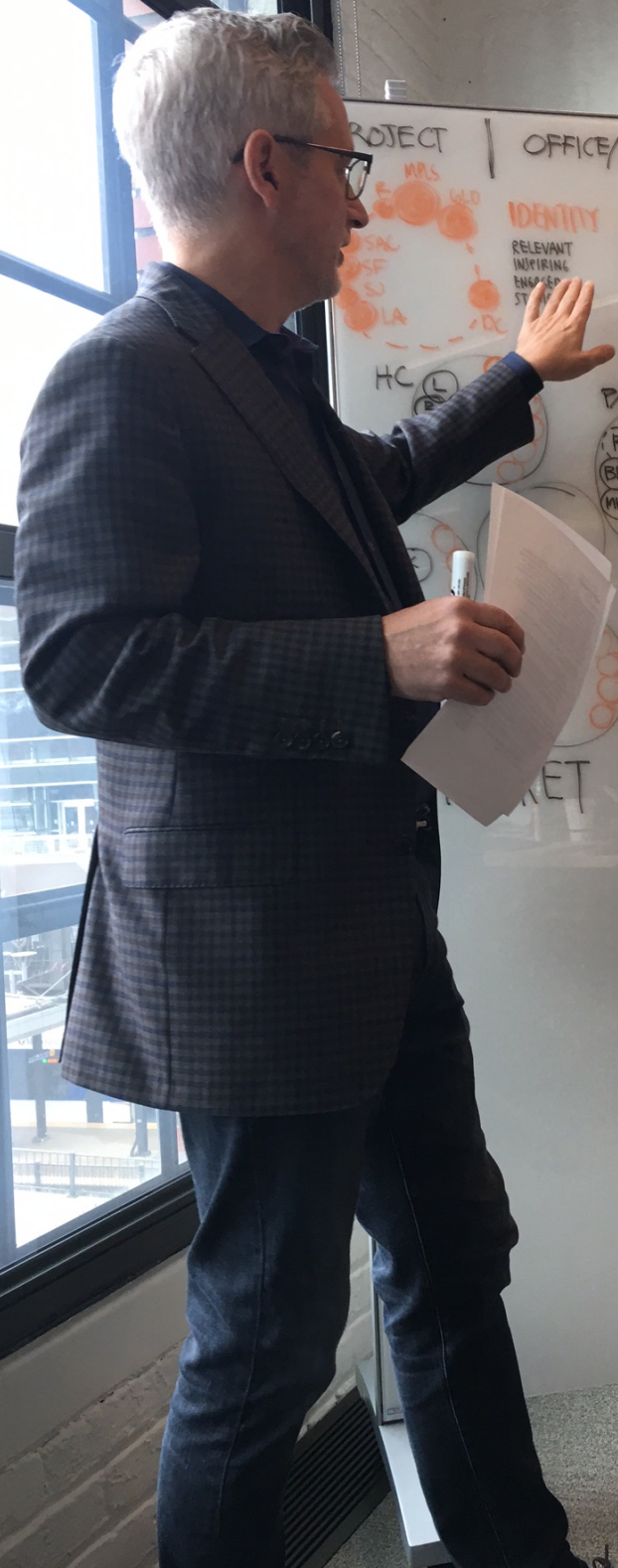
1970's "Empowerment" Style



Lean Style







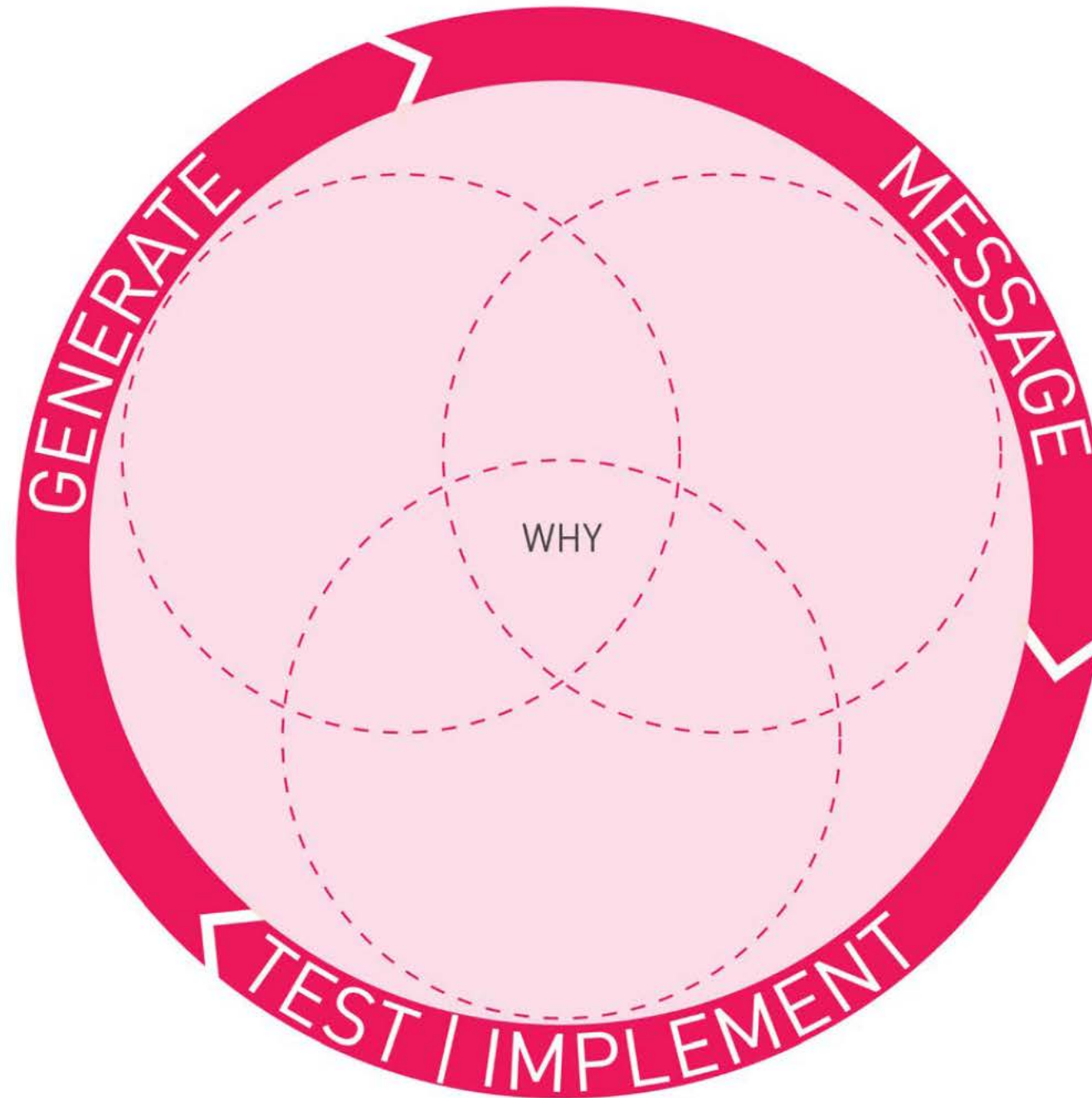


# EMBRACING CHANGE

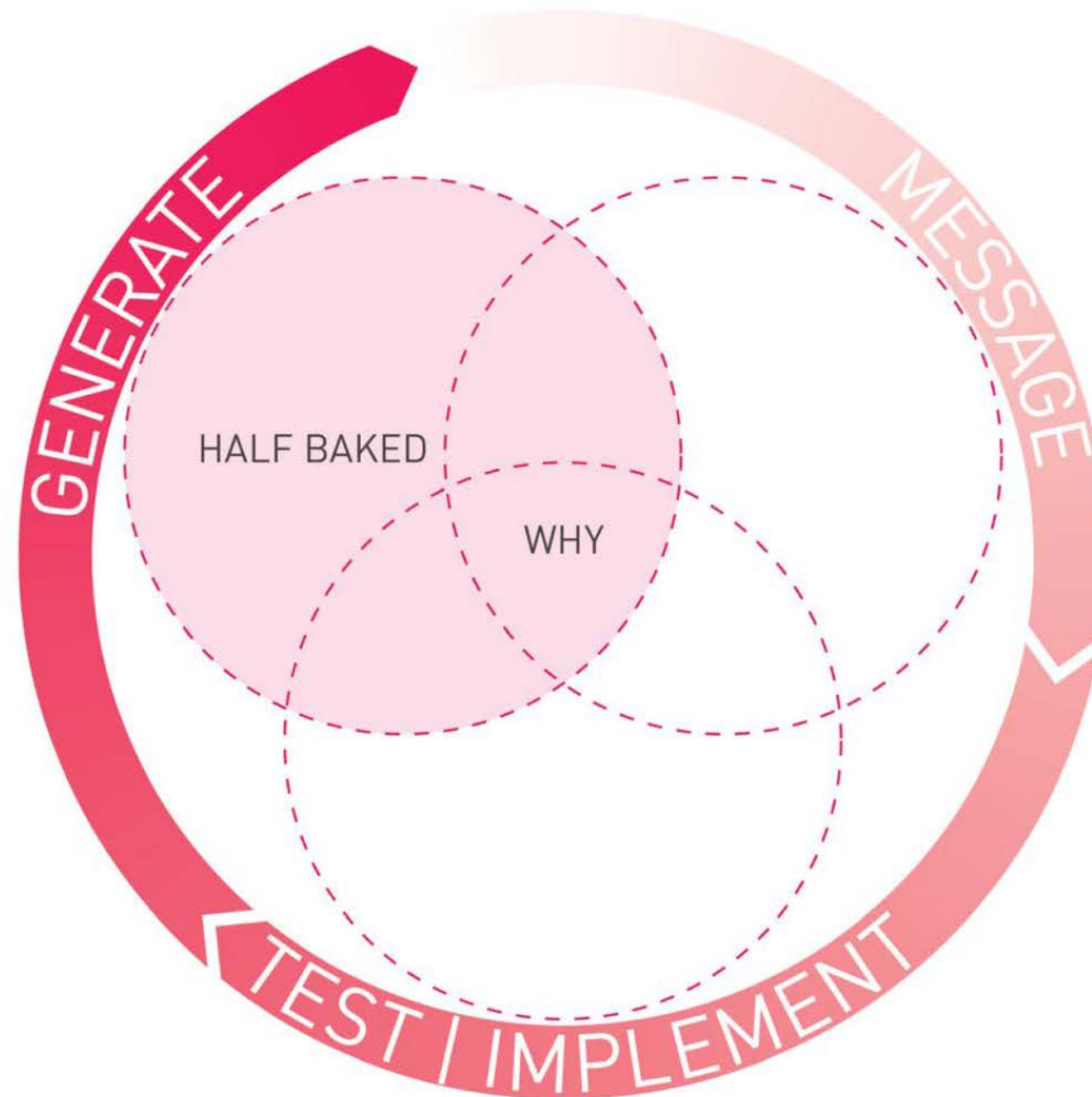
Jennifer Ries, Jonathan Bartling, Sarah Berseth and Lyssa Olker



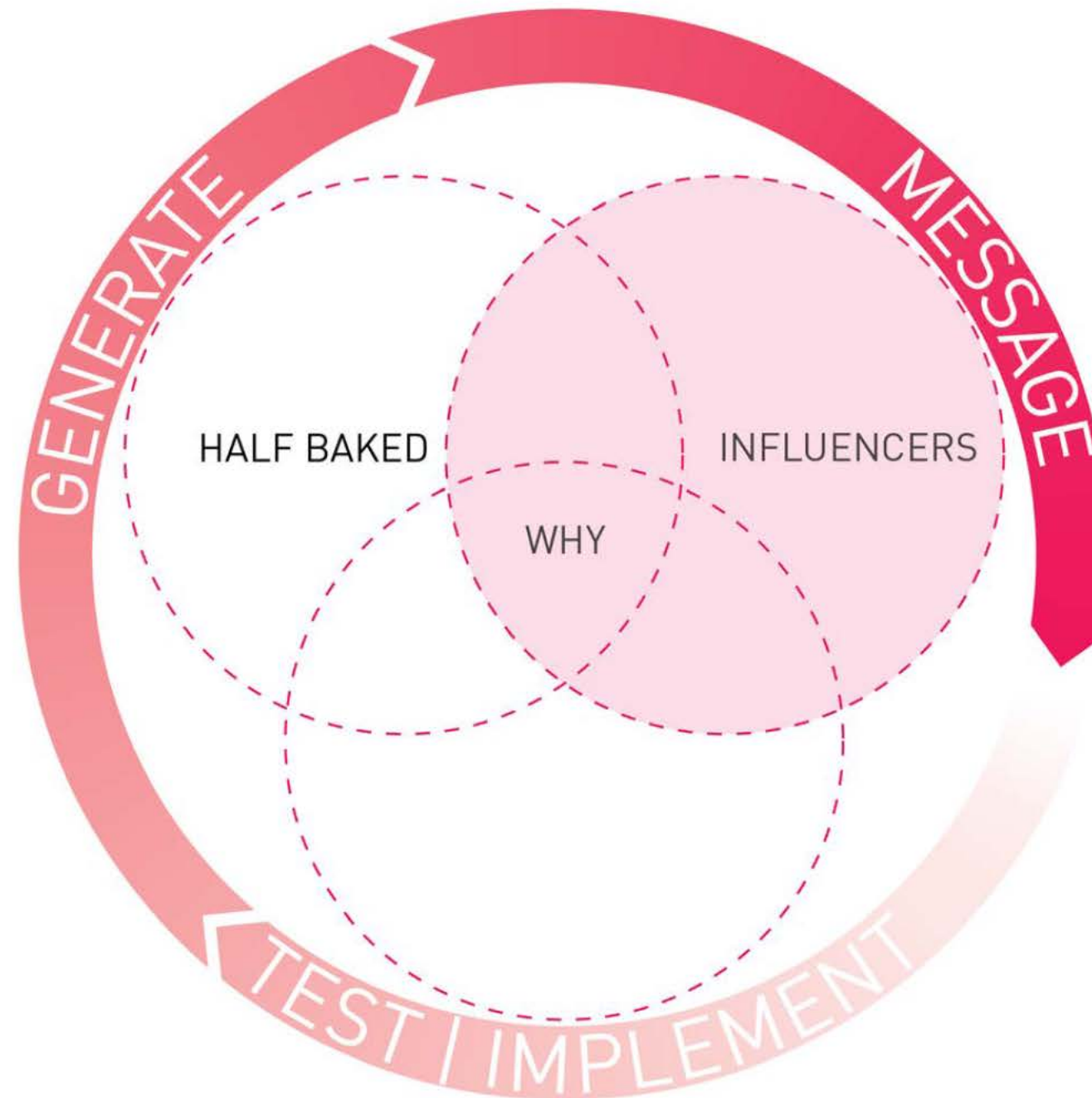
# PROCESS OF CHANGE



# FOUNDATIONS OF CHANGE: HALF BAKED IS OK

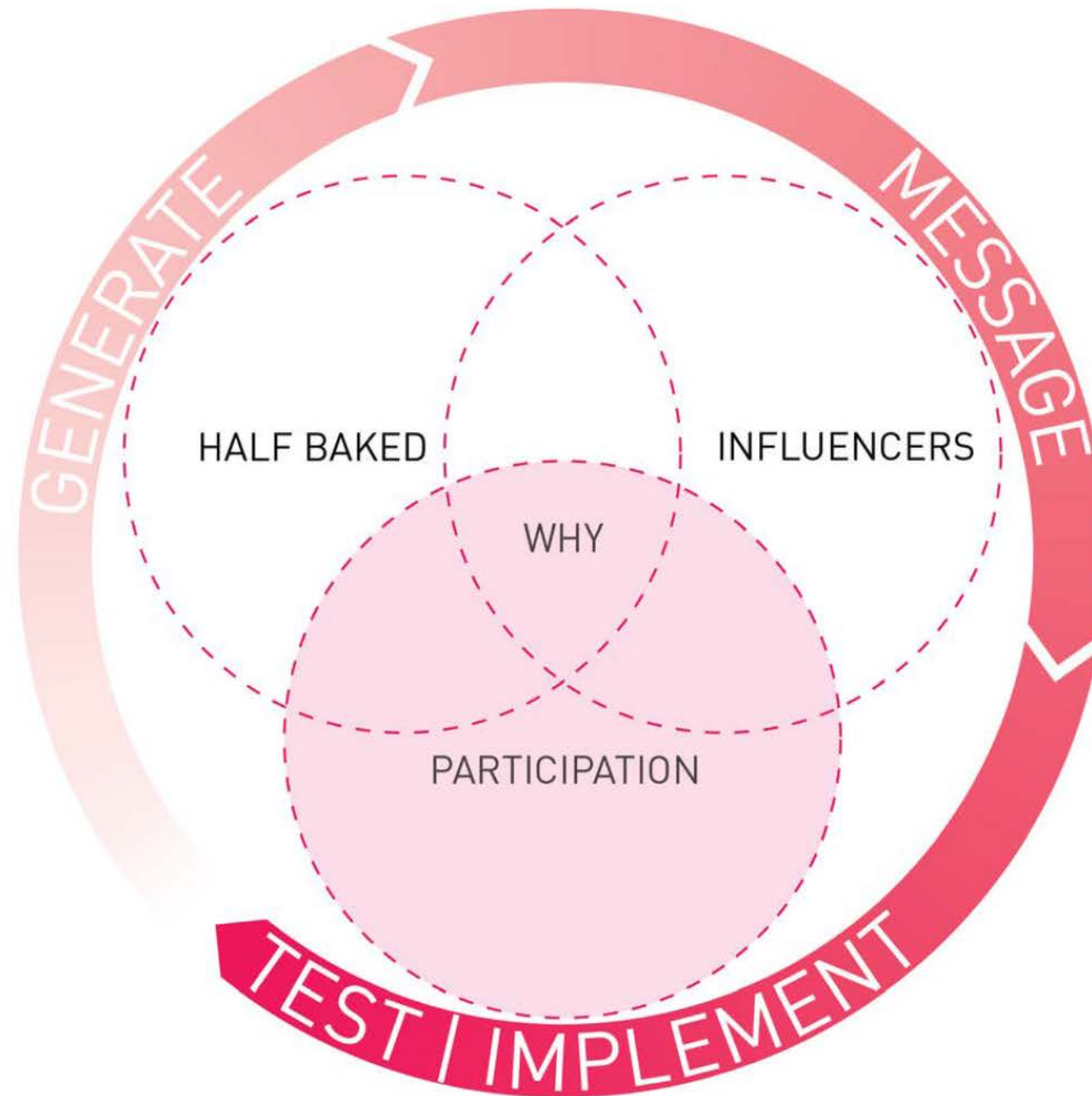


# FOUNDATIONS OF CHANGE: MESSAGE



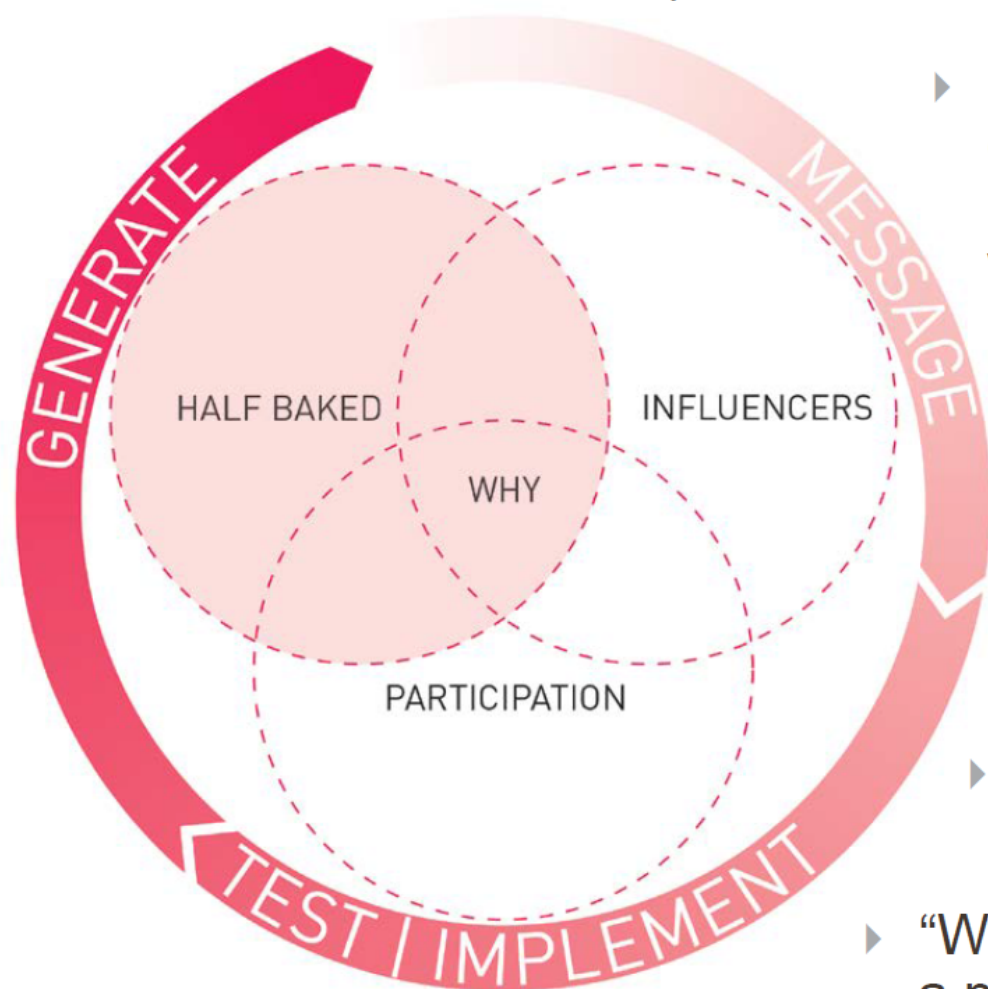


# FOUNDATIONS OF CHANGE: PARTICIPATION



# LISTENING TOUR

- ▶ “It is about an engagement process and not a communication plan.” MJ|MSP



- ▶ “...unlike many professions, ours affords us the fairly unique opportunity to continually reinvent our process because we have new opportunities to learn and develop on every new project we work on.” AK|MSP

- ▶ “We struggle with implementation. Great ideas disappear.” AA|MSP

- ▶ “Information is best distributed at the local level amongst people who have built up a level of trust.” JM|LOS

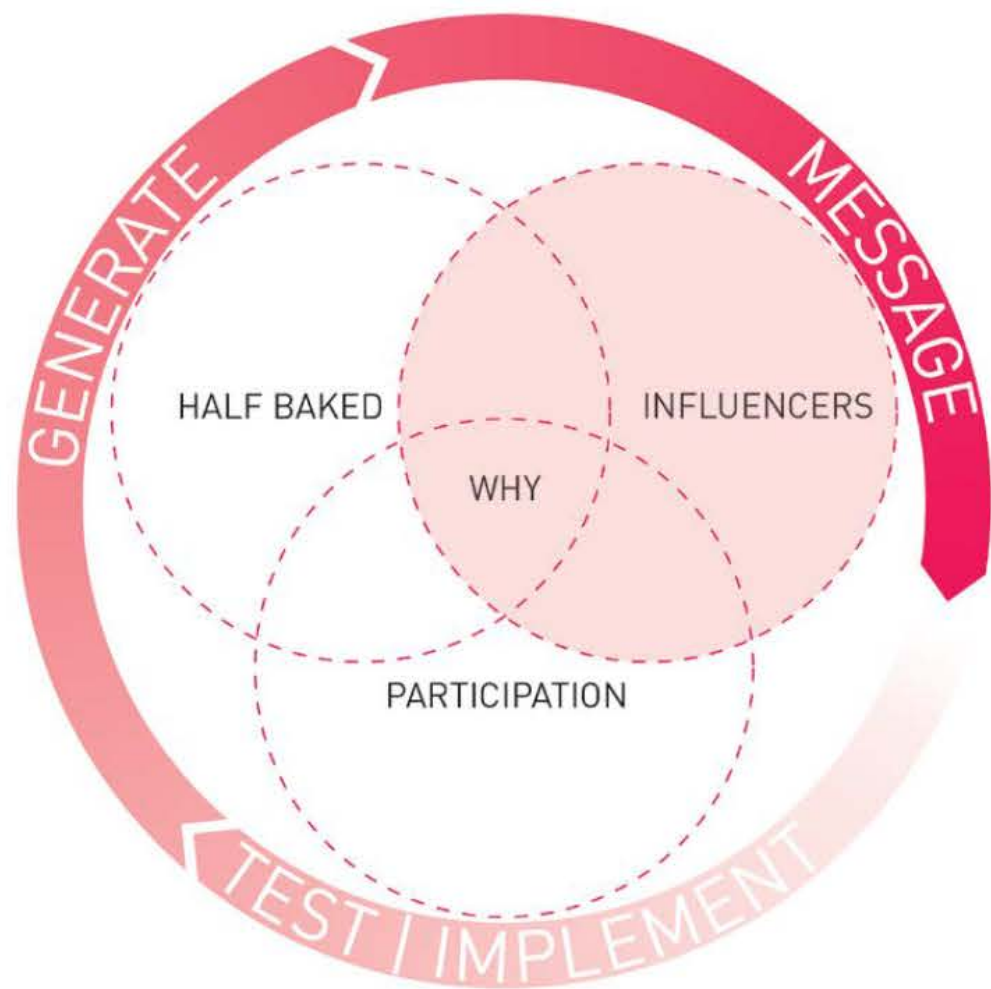
- ▶ “Accept it, change it, or leave it.” SJ|MSP

- ▶ “We need to go outside of our traditional job descriptions, outside of a prescriptive system of implementing a project. We need to get involved in the process. The how and the why.” AR|GLO

- ▶ “Ideas typically do not travel up the food chain.” JM|LOS



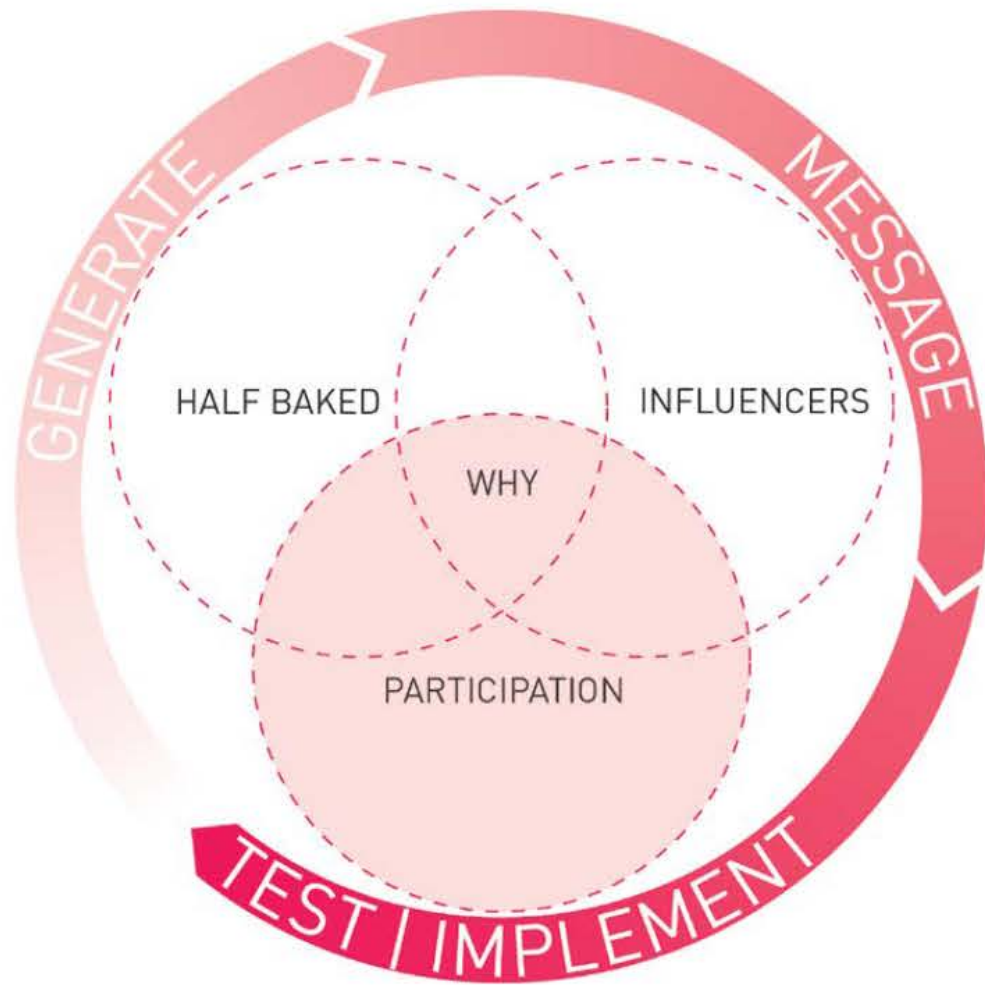
# TOWN HALL



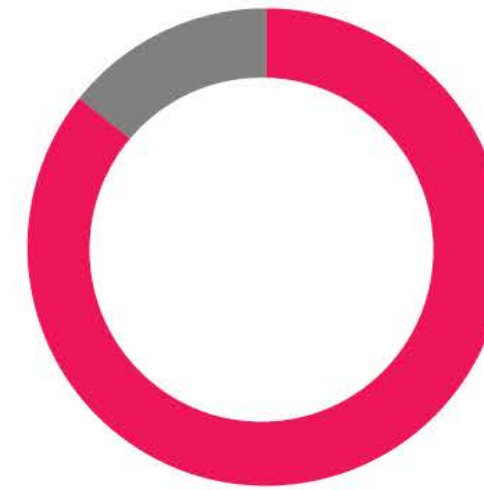
Minneapolis



# SURVEY ANALYTICS

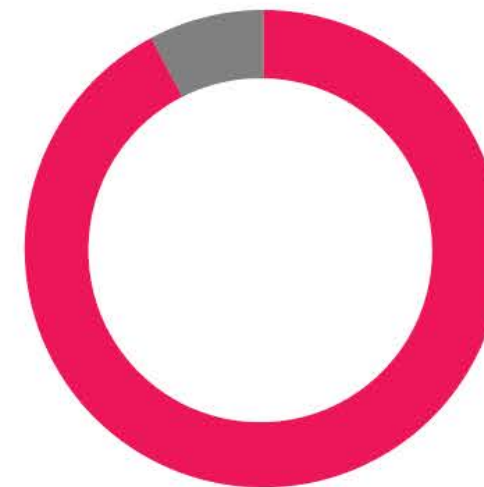


15 Min. Weekly



■ LIKELY  
■ UNLIKELY

Town Hall



■ LIKELY  
■ UNLIKELY

The model evolves





# The perfect Lean Design Firm

**IDEO, Palo Alto, California**

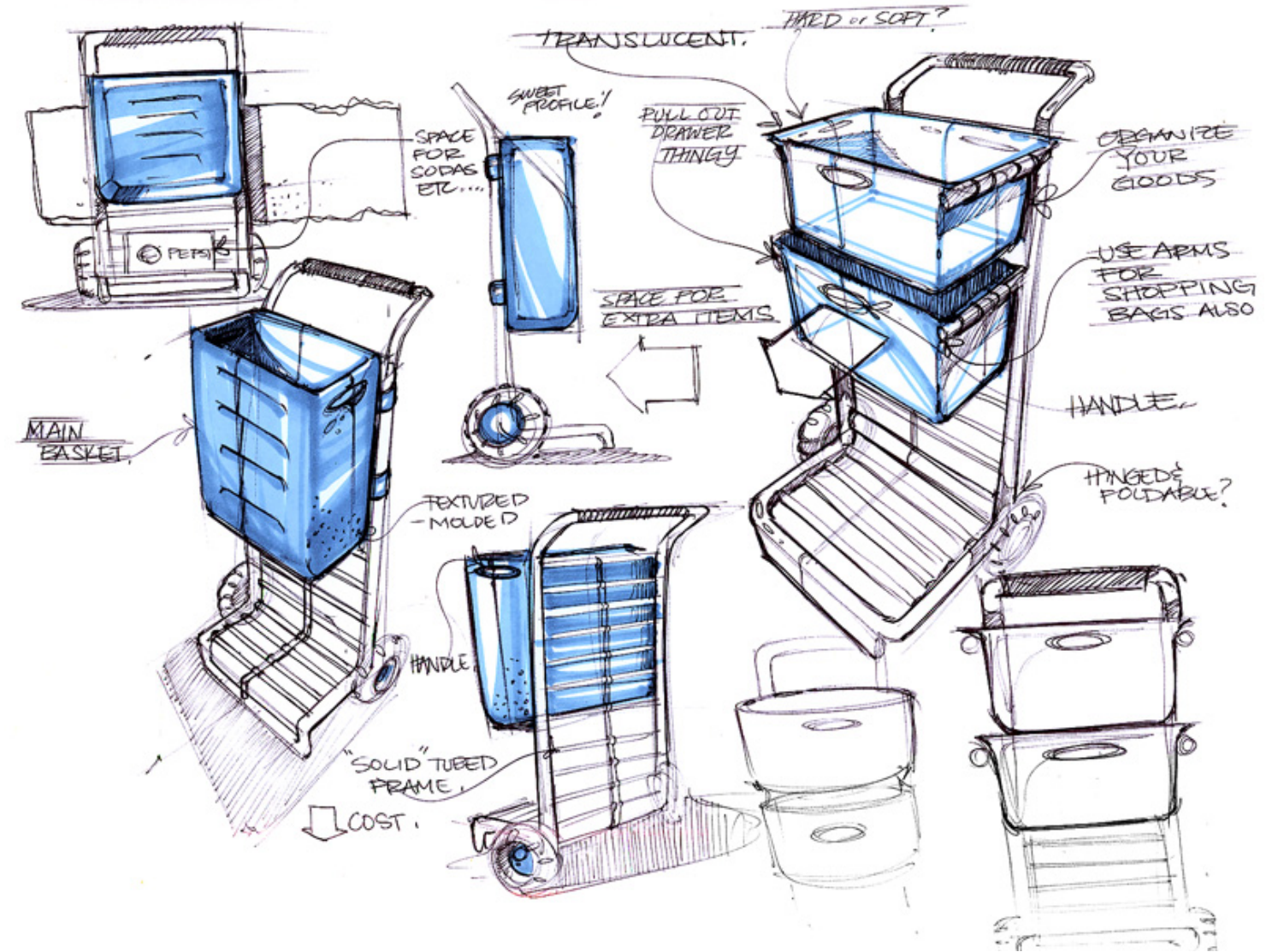
**Mainstreamed the idea of “Design Thinking”**

**-Utilize Going to the Gemba**

**-Root cause analysis**

**-Rapid Proto-typing**

**-...and neutral Standard of Care issues**



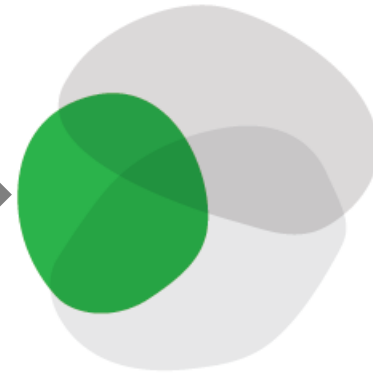
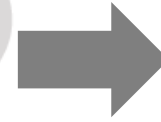




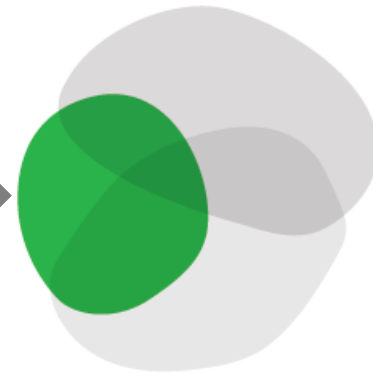
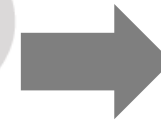
**inspire**



**ideate**



**implement**



inspire

### Vision

Mission Goals  
Desired  
outcomes  
Workplan  
Team  
Data request



### Current State

Shadowing  
Interviews  
Volumes /  
Thruput  
Workflows  
Benchmarks



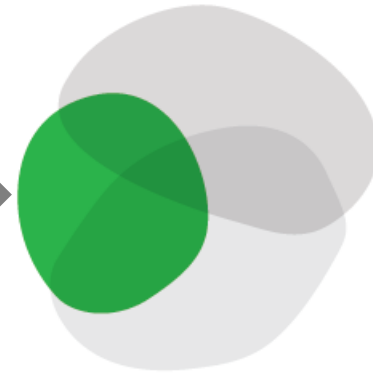
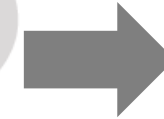
success → big questions



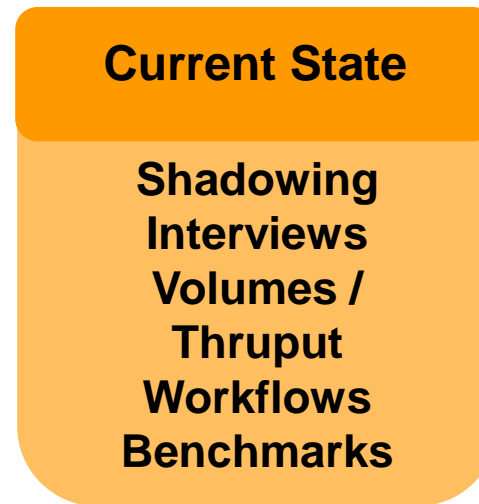
inspire



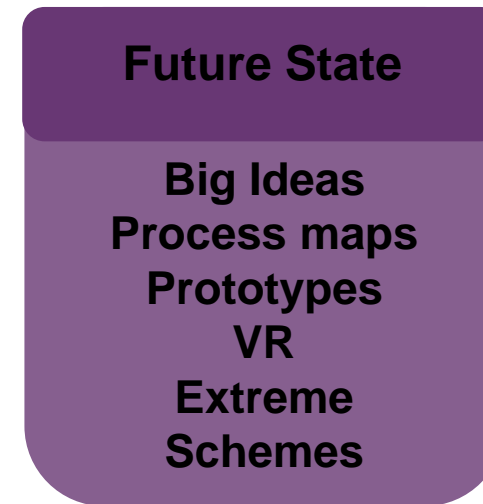
ideate



success



big questions



big ideas

→

→

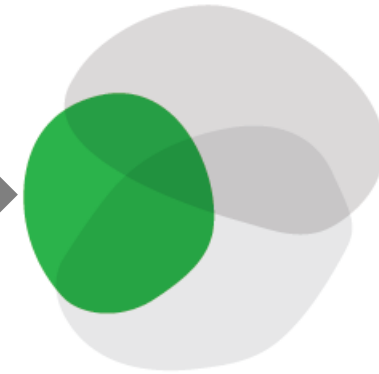
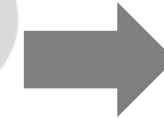




**inspire**



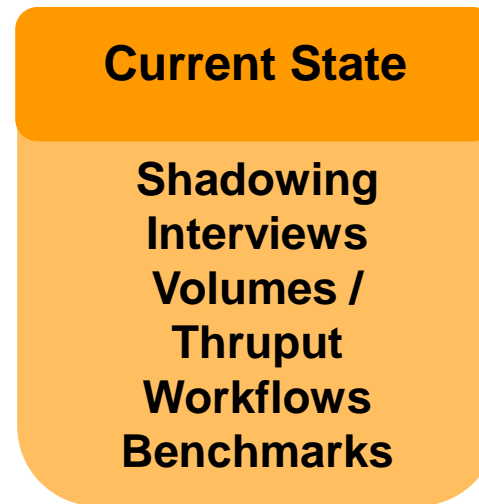
**ideate**



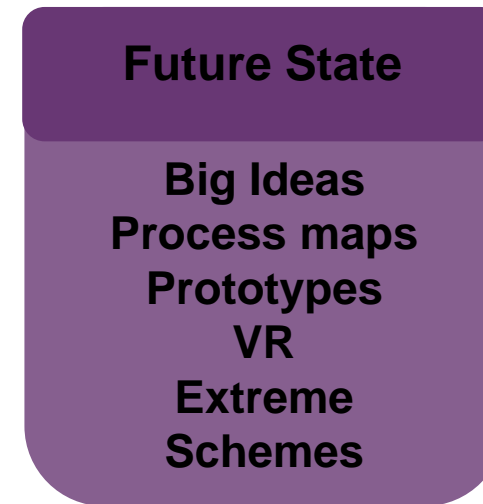
**implement**



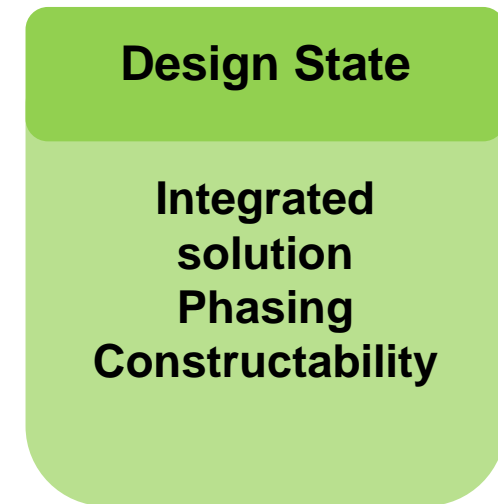
**success**



**big questions**



**big ideas**



**the answer**

→ big questions → big ideas → the answer





*Design is  
principally a  
social activity.*

-- Gregory Howell