

Project Management Methodologies



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DAMA-MN

August 15, 2018

Two BIG Ideas

- It Depends
- It's all about LEARNING

Building Models to Solve Engineering Problems – UMN – Institute of Technology course (~1978 – 2000)

- ☐ Thinking Like an Engineer
- ☐ Problem Identification
- ☐ Problem Formulation
- ☐ Problem Representation
- ☐ Problem Solving



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Top Three Main Engineering Work Activities

Engineering Total

Design – 36%

Computer applications
– 31%

Management – 29%

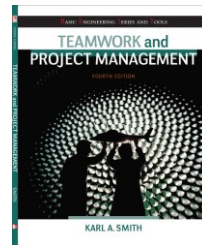
Civil/Architectural

Management – 45%

Design – 39%

Computer applications
– 20%

Burton, L., Parker, L., & LeBold, W. 1998.
U.S. engineering career trends. *ASEE
Prism*, 7(9), 18-21.

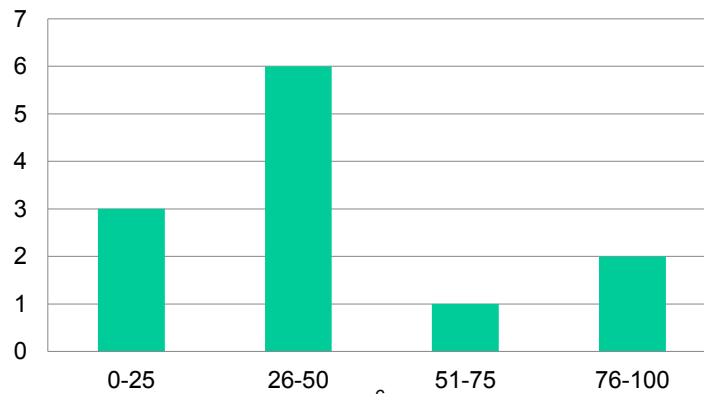


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Percentage of Current Work that is Project Work

DAMA – MN – August 15, 2018

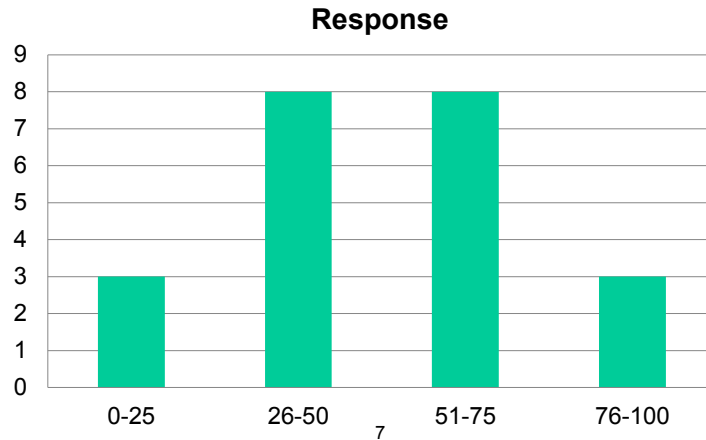
Response



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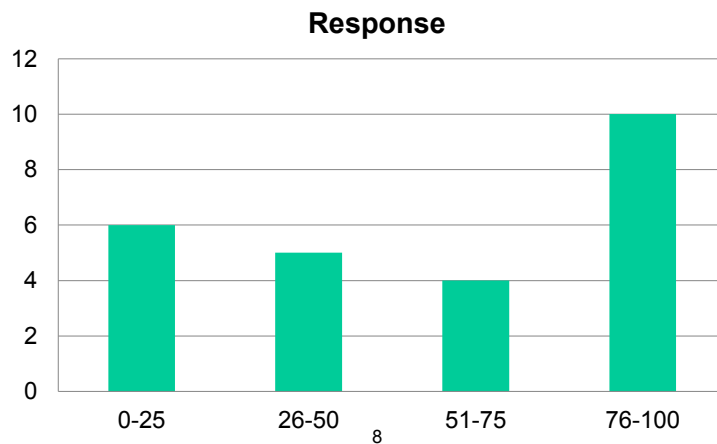
Percentage of Current Work that is Project Work

MOT 8221 – Spring 2018



Percentage of Current Work that is Project Work

MOT 8221 – Spring 2017



Process Clarity	Goal/Task/Deliverables Clarity	
	Low	High
High		?
Low		

What percentage of the projects you work on fit in the upper right hand quadrant (High Process Clarity AND High Goal/Task/Deliverables Clarity)?

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Process Clarity	Goal/Task/Deliverables Clarity	
	Low	High
High	Adaptive Project Management (APM)?	Traditional Project Management (TPM)
Low		Adaptive Project Management (APM)

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Types of Projects – Exploitation vs Exploration (March, 1991)

Exploiting Old Ways: Organizing for Routine Work	Exploring New Ways: Organizing for Innovative Work
Drive out variance	Enhance variance
See old things in old ways	See old things in new ways
Replicate the past	Break from the past
Goal: Make money now	Goal: Make money later

March, J.G. 1991. Exploration and exploitation in organizational learning.
Organizational Science, 2, 71-87

Characteristics of exploration and exploitation

(Martin, R. (2010) *Design of Business*, Table 1.1)

	Exploration	Exploitation
Organizational focus	The invention of business	The administration of business
Overriding goal	Dynamically moving from the current knowledge stage to the next	Systematically honing and refining within the current knowledge stage
Driving forces	Intuition, feeling, hypotheses about the future, originality	Analysis, reasoning, data from the past, mastery
Future orientation	Long-term	Short-term
Progress	Uneven, scattered, characterized by false starts and significant leaps forward	Accomplished by measured, careful incremental steps
Risk and reward	High risk, uncertain but potentially high reward	Minimal risk, predictable but smaller rewards
Challenge	Failure to consolidate and exploit returns	Exhaustion and obsolescence

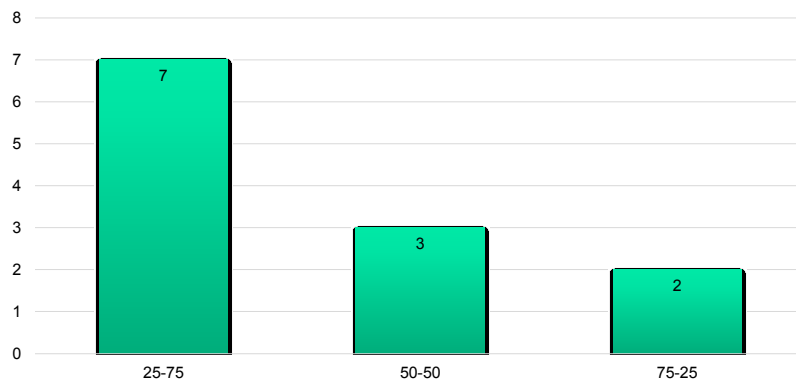
Typical Planning Processes for the Performance Engine and best practices for Innovation
Govindarajan and Trimble (2010) , Table 4.1

Planning Principles for Innovation	Norm in Performance Engine
Invest heavily in planning	Invest in proportion to budget
Create the plan and the scorecard from scratch	Just modify last year's plan
Discuss data and assumptions	Focus on data
Document a clear hypothesis of record	Document clear expectations
Find ways to spend a little, learn a lot	Be on budget, on time, and on spec
Create a separate forum for discussing results	Separate forums are unnecessary
Frequently reassess the plan	Deliver the results in the plan
Analyze trends	Analyze totals
Allow formal revisions to predictions	Revisions frowned on
Evaluate innovation leaders subjectively	Evaluate based on results

Distribution Between Supporting Innovation and Supporting On-Going Operations

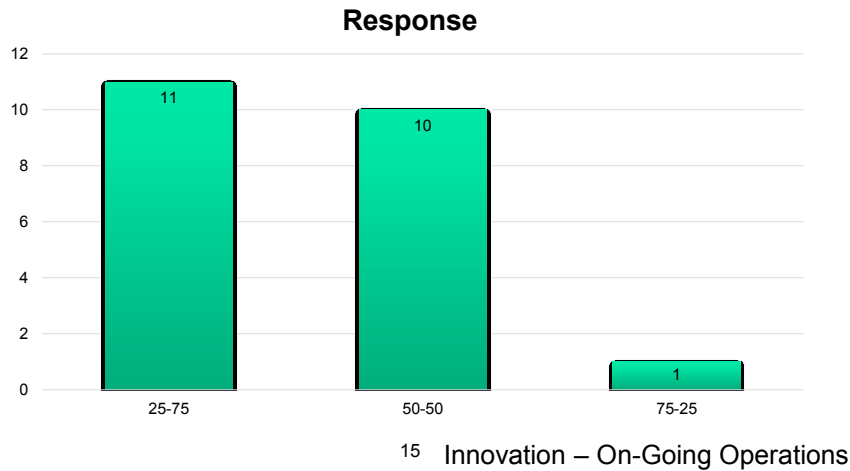
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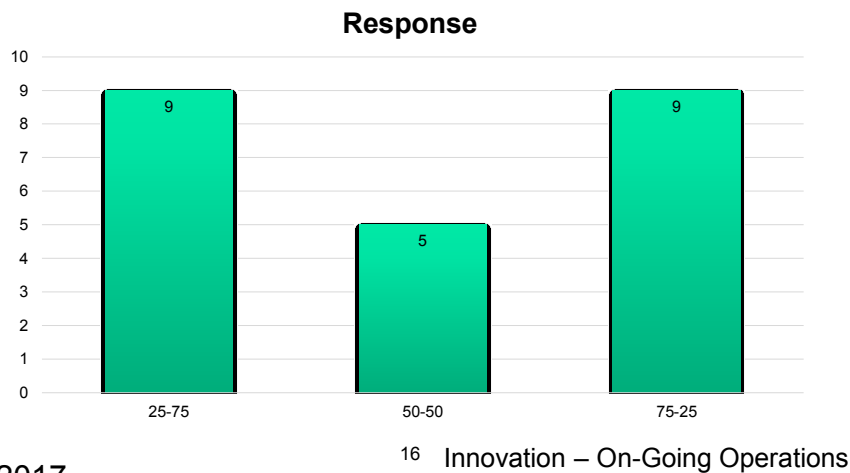


14 Innovation – On-Going Operations

Distribution Between Supporting Innovation and Supporting On-Going Operations

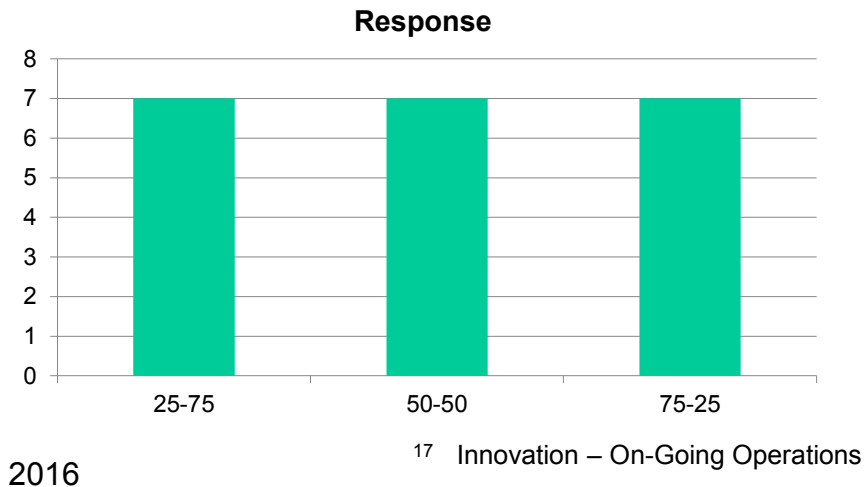


Distribution Between Supporting Innovation and Supporting On-Going Operations



2017

Distribution Between Supporting Innovation and Supporting On-Going Operations



Types of Projects

- On-going operations – Traditional Project Management – PMBOK
- Innovation – Agile/Adaptive Project Framework – Wysocki

Agile project management is an iterative and incremental method of managing the design and build activities for engineering, information technology, and new product or service development projects in a highly flexible and interactive manner (Wikipedia, 2014)

Strategic Project Leadership (Shenhar)



Fig. (2). SPL - The new science of project management.

Shenar, Aaron, J. 2015. What is Strategic Project Leadership?

<https://pdfs.semanticscholar.org/6d5f/e12416ad7e87d7a6ee17a8adb13b92428c43.pdf>

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Agile Principles*

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiations
- Responding to change over following a plan

*Principles behind the Agile Manifesto. 2001. *Manifesto For agile software development*.

<http://agilemanifesto.org/principles.html>

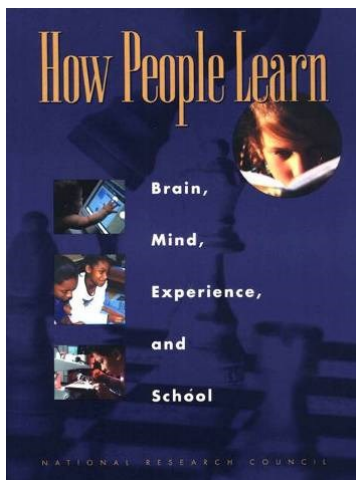
Agile Projects: Typical Activities*

- Team Manifesto
- Planning and Prioritization
- Iteration (or Sprint)
- Daily Standup (or Scrum)
- Product Demonstration
- Retrospective

*MacNeal, R. 2014. Agile projects and teams. In Smith, 2014, *Teamwork and project management, 4e.* NY: McGraw-Hill

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Project Management Expertise



Expertise Implies (Ch. 2):

- a set of cognitive and metacognitive skills
- an organized body of knowledge that is deep and contextualized
- an ability to notice patterns of information in a new situation
- flexibility in retrieving and applying that knowledge to a new problem

Bransford, Brown & Cocking. 1999. *How²² people learn*. National Academy Press.

Characteristics of Expert PMs

- Ability to identify and simply define a problem quickly
- Critical thinking
- Strong problem solving skills
- Organized
- Communication
- Open mindedness
- Knowing your team
- Knowledge of business domain. This can provide guard rails to requirements and technical design
- Energy, enthusiasm, commitment to the goal and the team
- Very clear understanding of PMBOK
- Approachable and focused on positive interactions
- Conflict management
- Prioritization
- humble

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Acquisition of Expertise

Fitts P, & Posner MI. Human Performance. Belmont, CA: Brooks/Cole, 1967.

- Cognition: Learn from instruction or observation what knowledge and actions are appropriate
- Associative: Practice (with feedback) allowing smooth and accurate performance
- Automaticity: “Compilation” or performance and associative sequences so that they can be done without large amounts of cognitive resources

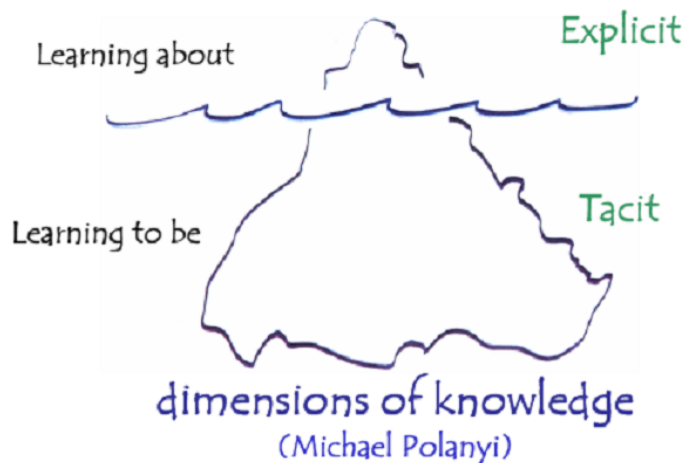
“The secret of expertise is that there is no secret. It takes at least 10 years of concentrated effort to develop expertise.” Herbert Simon

Paradox of Expertise

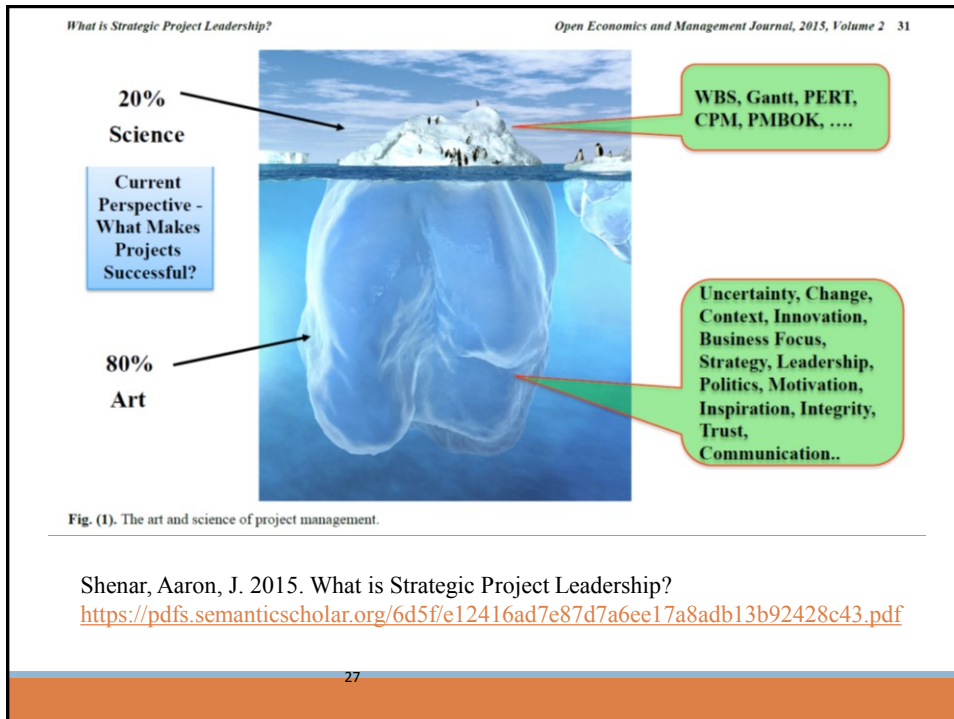
- The very knowledge we wish to teach others (as well as the knowledge we wish to represent in computer programs) often turns out to be the knowledge we are least able to talk about.

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'Learning to be' sooner rather than later!

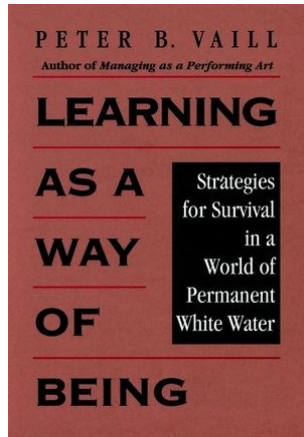


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“The only sustainable competitive advantage is an organization's ability to learn faster than the competition.”

— Peter M. Senge



LEARNING: Changes a person makes in himself or herself that increase the know-why and/or the know-what and/or the know-how the person possesses with respect to a given subject.

The primary purpose of this book is to make the nature of continual learning for managerial leadership real and not just the cliché of congressional testimonies and keynote addresses at meetings of educators.

Learning Organization

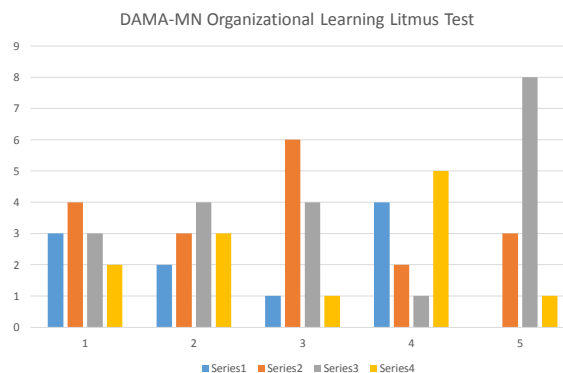
A learning organization is an organization skilled at creating, acquiring, interpreting, transferring, and retaining knowledge, and at purposefully modifying its behavior to reflect new knowledge and insights – David Garvin

Garvin, David. 2000. Learning in action: A guide to putting the learning organization to work. Cambridge, MA: Harvard Business School Press.

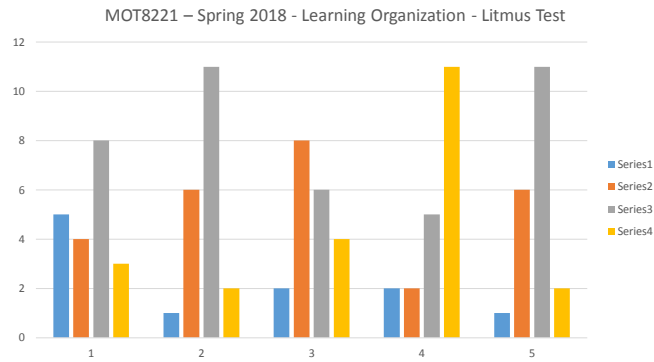
Learning Organization – Litmus Test

1. Does the organization have a defined learning agenda? **No 1 2 3 4 Yes**
2. Is the organization open to discordant information? **No 1 2 3 4 Yes**
3. Does the organization avoid repeated mistakes? **No 1 2 3 4 Yes**
4. Does the organization lose critical knowledge when key people leave? **No 1 2 3 4 Yes**
5. Does the organization act on what it knows? **No 1 2 3 4 Yes**

Garvin (2000) p. 15.



1. Does the organization have a defined learning agenda? **2.33**
2. Is the organization open to discordant information? **2.67**
3. Does the organization avoid repeated mistakes? **2.42**
4. Does the organization lose critical knowledge when key people leave? **2.58**
5. Does the organization act on what it knows? **2.83**



1. Does the organization have a defined learning agenda? **2.4**
2. Is the organization open to discordant information? **2.7**
3. Does the organization avoid repeated mistakes? **2.6**
4. Does the organization lose critical knowledge when key people leave? **3.3**
5. Does the organization act on what it knows? **2.7**

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Learning Requires*

deliberate

distributed

practice

***Thanks to Ruth Streveler for these slides**

Also see Brown, P.C., Henry L. Roediger III, H.L., & Mark A. McDaniel, M.A. (2014). *Make It Stick: The Science of Successful Learning*. Belknap Press: An Imprint of Harvard University Press

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Key Implications

Deliberate

Attention must be paid

Attention and processing power = cognitive load (bandwidth)

- LIMITED – need to be careful how one uses the learner's bandwidth
 - Link to Curricular Priorities
- Continuous partial attention
- Reflection is needed
 - Need for feedback
 - Link to assessment

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Key Implications

Distributed

Repetition over time

- Spaced vs. massed practice*
- Spiral curriculum

Multiple modes of input

- Visual
- Audio
- Kinesthetic
- Self-explanation
- Explaining to others

*Kandel, E.B. 2007. In Search of Memory: The Emergence of a New Science of Mind. New York: Norton.

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Key Implications

Practice what you want to learn

Active (Attentive) – doing something

Constructive – adding to your prior knowledge

Interactive – working with others to add to your prior knowledge

Chi, M.T.H. 2009. Active-Constructive-Interactive: A Conceptual Framework for Differentiating Learning Activities. *Topics in Cognitive Science* 1, 73–105.

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Lean Startup Method

Who's familiar with the Lean Startup Method?

Two Parts to Innovation* (including Educational)

1. Advancing the science/technology
[research]
 2. Finding a repeatable business model
- **Current efforts focus on #1**
 - **Successful efforts require both**

*Innovation - **the adoption of a new practice in a community.**
Denning and Dunham (2010) *The Innovators Way*. MIT Press

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Lean Startup Method

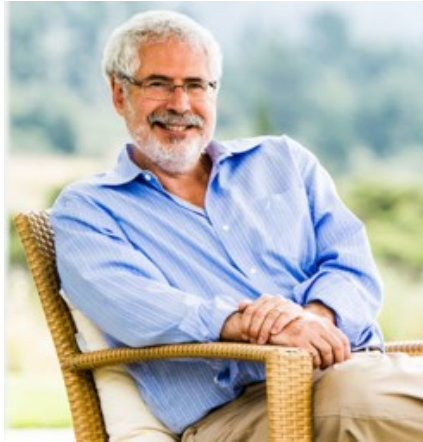
Lean Startup isn't just about starting a company ...

It's really about how to maximize the number of people you help and impact

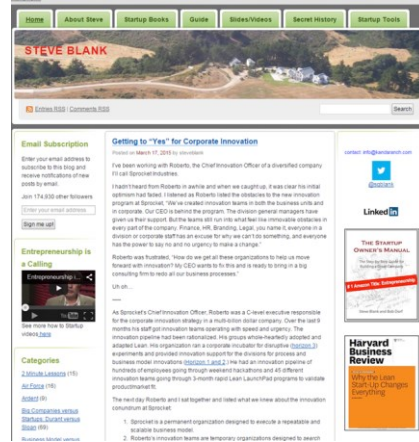
Business Modeling & Mission Modeling

Lean Startup

Three Steps to Taking an Idea to a Business



Steve Blank, Lean LaunchPad® Developer



www.steveblank.com

1. Frame Hypotheses

- Frame Hypotheses → Business Model Canvas

BUSINESS MODEL CANVAS

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
	Key Resources		Channels	
Cost Structure			Revenue Streams	

1. Frame Hypotheses

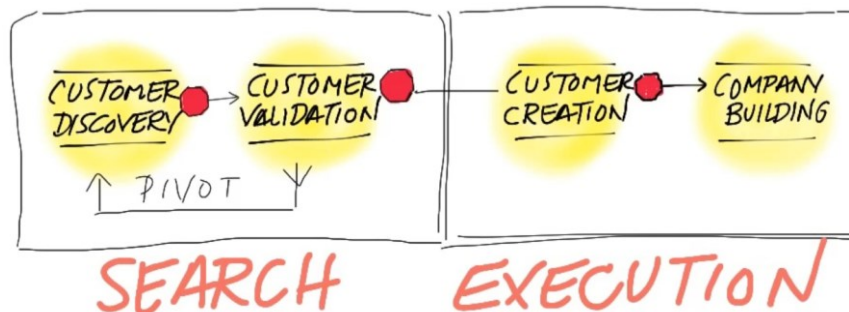
Mission Model Canvas			Mission (or "problem") Description goes here	
Key Partners Which of these activities can your company outsource to others?	Key Activities What are the <i>unique</i> activities your company needs to deliver the value proposition? Key Resources Which of these activities does your company need to own?	Value Proposition For each beneficiary what is their value proposition? What problem/pain/gain does this solve for them?	Buy-in & Support For each beneficiary how does the team get "Buy-In" Deployment <ul style="list-style-type: none"> What will it take to deploy the MVP to widespread use? " What constitutes a successful deployment? 	Beneficiaries/ Stakeholders <ul style="list-style-type: none"> By title/function who are the individuals we are creating value for? What is their archetype
Mission Budget (or cost) What are the costs to deliver the value proposition?			Mission Achievement/Success (or "fulfillment" or "impact") Factors For each beneficiary how does the team know they succeeded?	

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2. Test Hypotheses

- Frame Hypotheses → Business Model
- Test Hypotheses → Customer Development Beneficiaries/Stakeholders



3. Build Incrementally & Iteratively

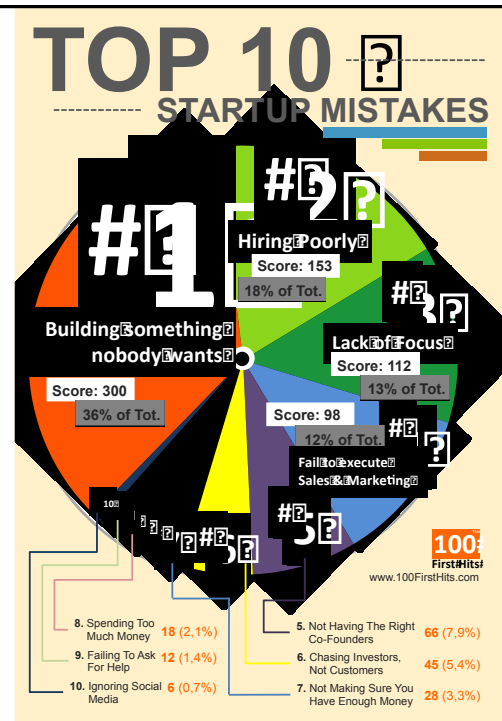
- Frame Hypotheses → Business Model
- Test Hypotheses → Customer Development
- Build the product/service Iteratively & Incrementally → **Agile Engineering**
- Achieve the mission

Rapid Learning

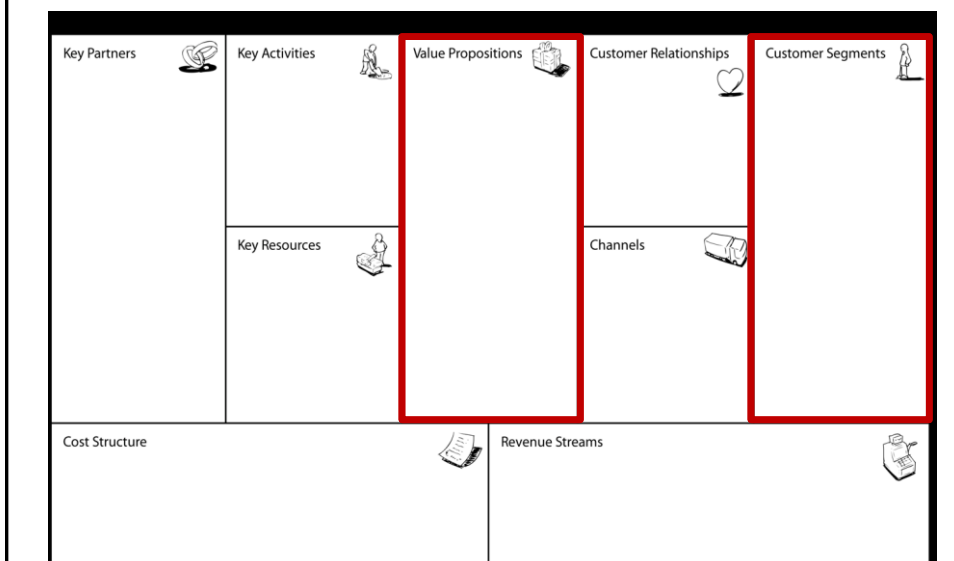
- Out of the building 10-15 hours/weekly
- Formal methodology for customer interaction
- *Evidence-based* decisions
- Focus on **rapid learning**
100 customers/partners in eight weeks

Mistake #1

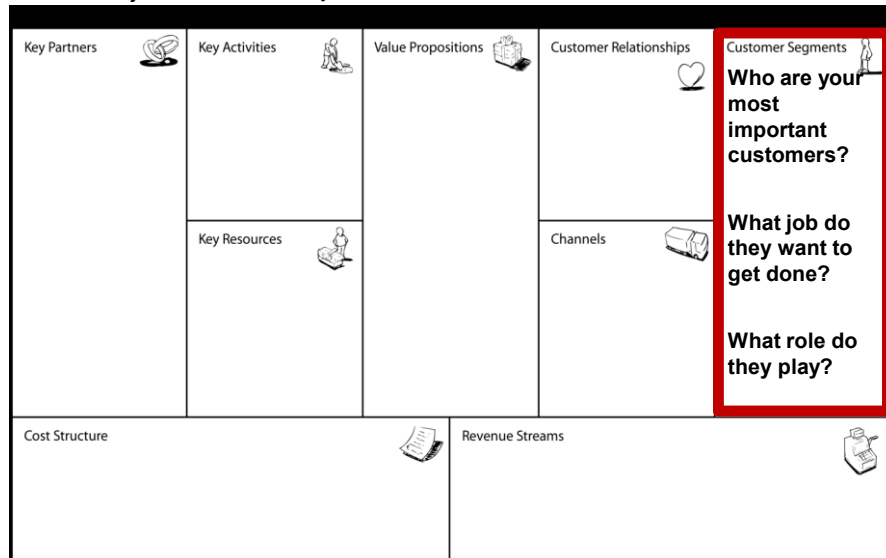
**Building
Something
Nobody
Wants!**



That's why we start with *these*



Customer Segments, Beneficiaries, Stakeholders (Does Anyone Care?)

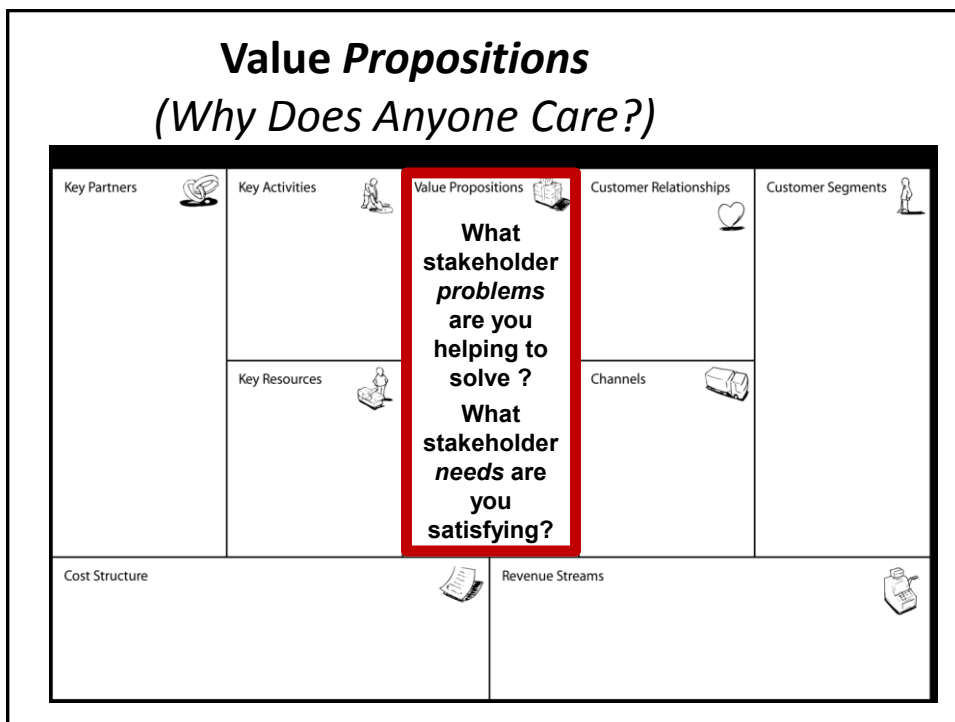


Big Idea: Multiple CS Roles

- The **Payer/Decision Maker** may be different from the **End User/Beneficiary**
- Each **Role in a CS** has its own specific **VP**

CS Roles	
Beneficiary	An individual or group benefitting from an innovation
End User	The day-to-day users of a product or service Possibly have the least influence
Decision Maker	Those having the ultimate/final purchasing authority
Payer	Those that control the purchase of products or services
Influencer – Recommender – Skeptic –	Informants, opinion leaders with persuasive power An individual or group with powerful influence to buy Their influence can slow or stop the purchase

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The Value Proposition

A **value proposition** is a promise of value to be delivered. It is a clear statement that:

- explains how your innovation solves customers' problems or improves their situation (**relevant**),
- delivers specific benefits (**descriptive, measurable**),
- tells the user or buyer why they should use it or buy from you and not from the competition (**unique**).

<http://conversionxl.com/value-proposition-examples-how-to-create/#>.

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Reflection and Dialogue

- Individually reflect on the session. Write for about 1 minute.
 - Key takeaways
 - Lessons learned
 - Questions/Comments
- Discuss with your neighbor for about 2 minutes
 - Select/create a response to present to the whole group if you are randomly selected