

Evaluating Innovations in Real Time: Packaging and Spreading Innovation

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Outline

- Innovation and diffusion: “a perfect complexity”
- Implications for evaluation
- Examples from the literature
- Summary



General Internal Medicine: *e pluribus unum*

- Value-adding activities of primary care
 - Triage
 - Navigation
 - Primary prevention
 - Screening
 - Acute care
 - Chronic illness management
 - End-of-life care
 - Psychosocial care



Life on “Eye Street”

- Innovation
- Intervention
- Implementation
- Improvement



Challenge to Evaluators: “Doubling Down” on Complex Interventions

- Payment scheme
- Practice management redesign
- Staffing change
- Clinician behavior modification program
- Patient behavior modification program
- Communications project
- Health information technology project

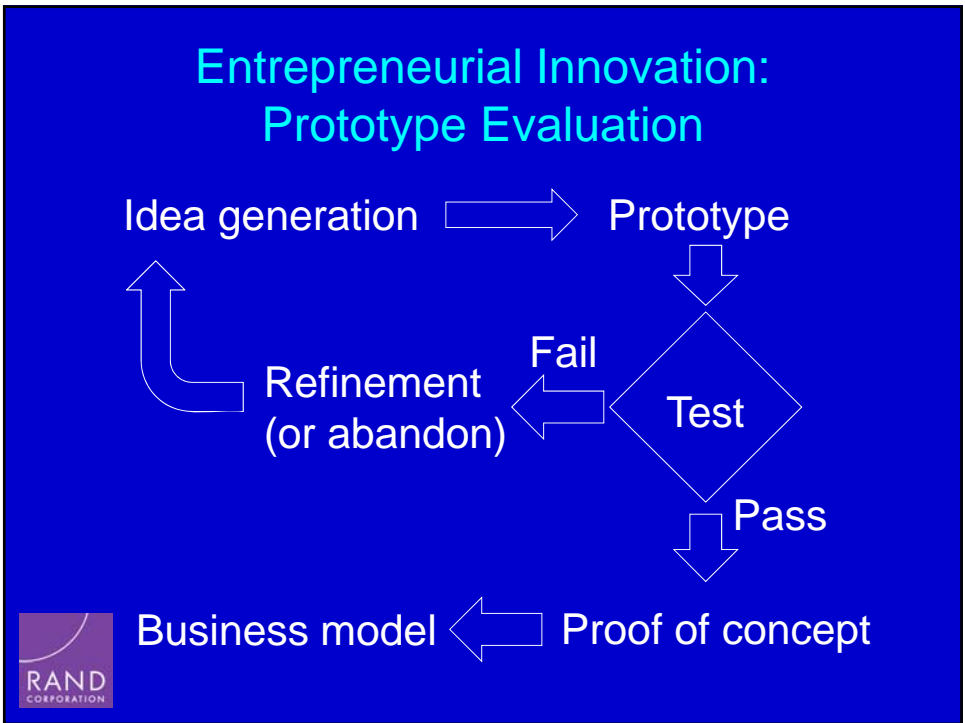


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What is an innovation?

Idea, practice, or tool that is perceived as new by the individual or other “unit of adoption”





Zones and Types of Product Innovation

PRODUCT LEADERSHIP ZONE	CUSTOMER INTIMACY ZONE	OPERATIONAL EXCELLENCE ZONE	CATEGORY RENEWAL ZONE
Disruptive Innovation	Line-Extension Innovation	Value-Engineering Innovation	Organic Innovation
Application Innovation	Enhancement Innovation	Integration Innovation	Acquisition Innovation
Product Innovation	Marketing Innovation	Process Innovation	Harvest and Exit
Platform Innovation	Experiential Innovation	Value-Migration Innovation	



Moore, G. [Dealing with Darwin](#), 2005

To improve quality, innovations are critically dependent on diffusion

- Diffusion is the process by which an *innovation* is *communicated* through certain *channels* over *time* among members of a *social system*



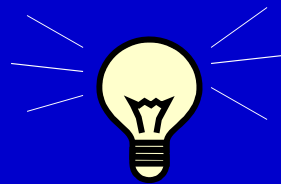
Linear (“Rational”) Model of Diffusion

Innovator

Receiver



Linear (“Rational”) Model of Diffusion

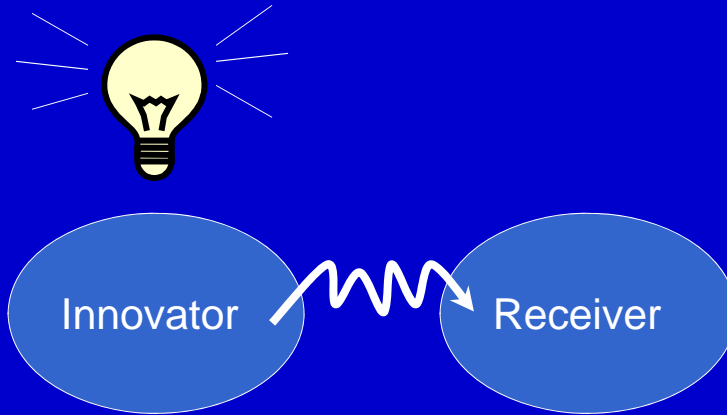


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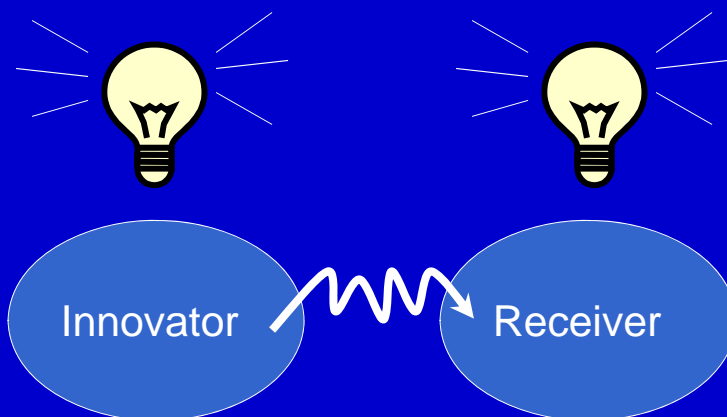
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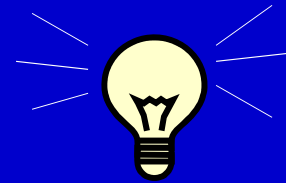
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Linear ("Rational") Model of Diffusion



Social Model of Diffusion

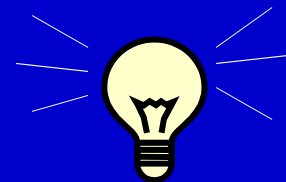


Innovator

Receiver



Social Model of Diffusion

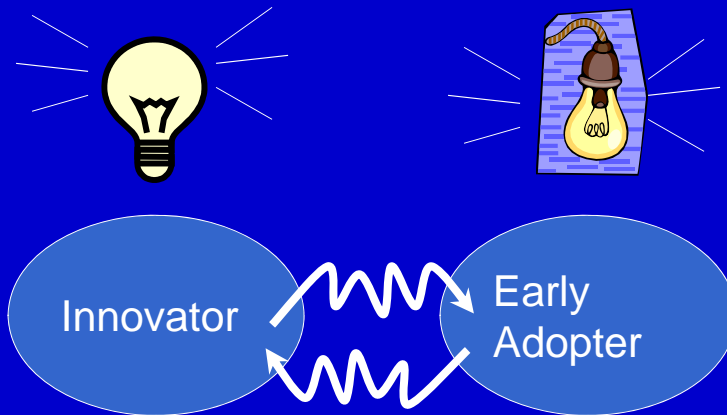


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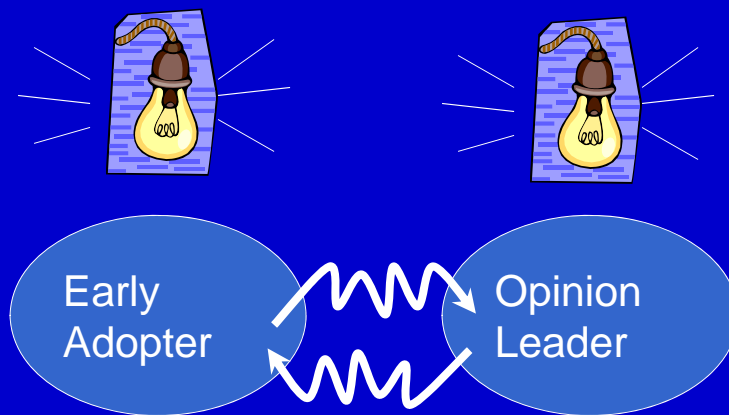
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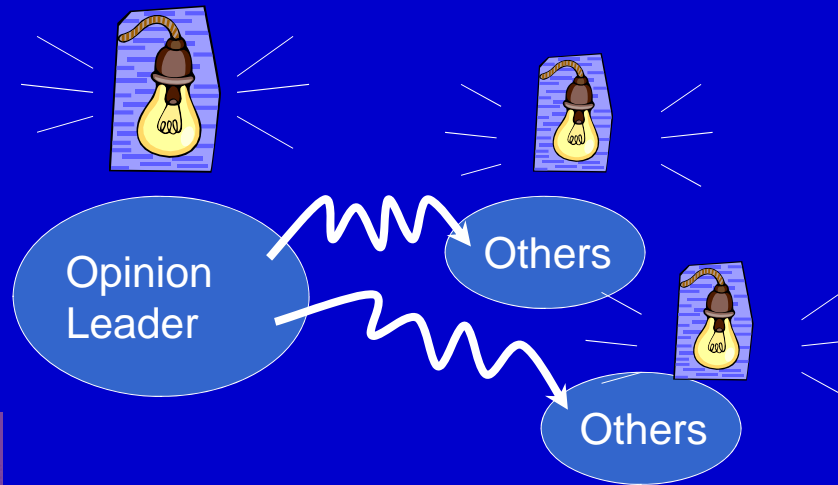
Social Model of Diffusion



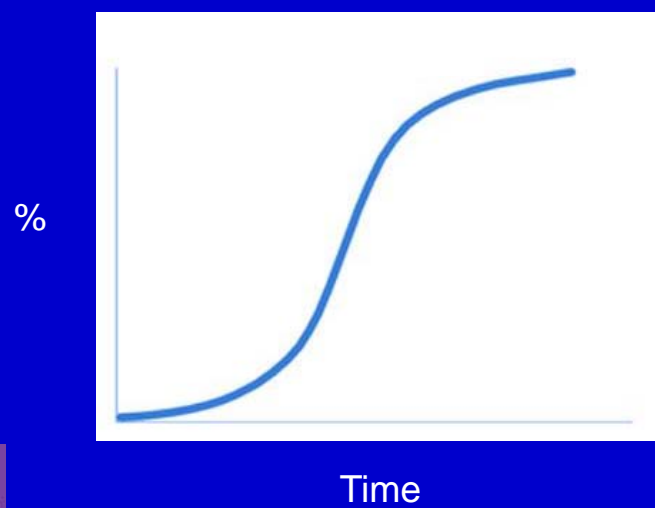
Social Model of Diffusion



Social Model of Diffusion



Take Up of Successful Innovations



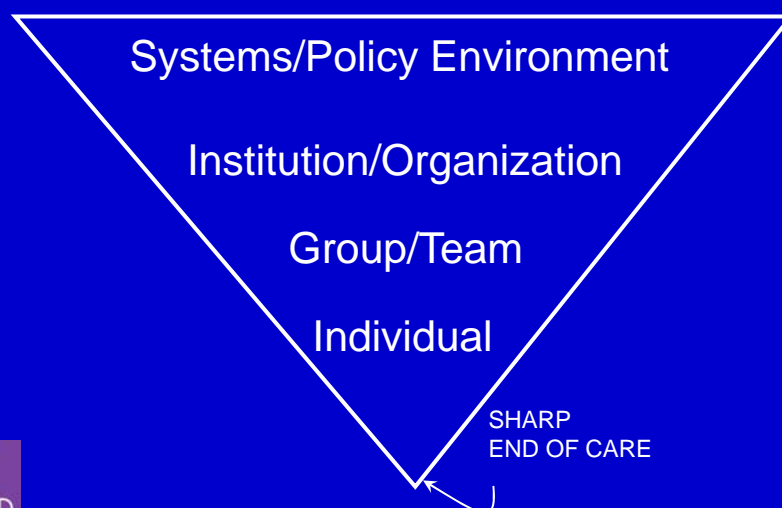
Characteristics of an innovation that enhance diffusion

- Simplicity
- Relative advantage
- Trialability
- Capacity for reinvention
- Compatibility
- Observability



Berwick D, JAMA, 2003

Context Factors



Implications for Evaluators

- High risk of failure or “partial success”
- Frame the target and purpose of the evaluation
 - Innovations are nearly always modified in practice
 - Context factors can trump take up
- Timing of measurements is critical
 - Median “time to take up” is difficult to predict
 - Take up is almost never 100%
- Analysis and interpretation are challenging
 - Partial take up is difficult to interpret
 - Comparison groups are critical



Key Framing Questions for Real-time Evaluation

- What is the evaluation intended to do?
 - Is the main focus learning or accountability?
- Who will use the evaluation results and for what purpose?
- What decisions will rely on this evaluation?



Specifying the Intervention

- Specify a Logic Model
 - Components of the innovation/intervention “package”
 - Rationale for inclusion of each component of the innovation/intervention
 - Implementation plan
 - Expected outcomes

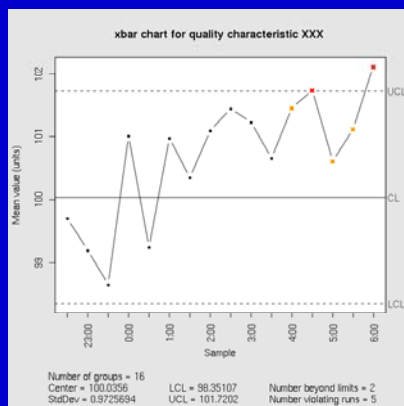


Data Collection

- Avoid collecting data for underpowered comparisons
- Use key informant interviews
 - Assess fidelity
 - Document unexpected changes to the innovation/intervention package
- Attempt to obtain all relevant perspectives
 - Involve leaders in study design



Control Charts: Use with Caution



- Fun Facts

- Shewhart believed that choice of control limits was a convenient heuristic that lacked an empirical basis
- Deming said that control charts are not useful for hypothesis testing



Example 1 Geisinger ProvenCare

- Single payment for all CABG service and post-op complications (warranty)
 - Pay-for-performance on 40 care elements
- Evaluation
 - 137 patients pre-intervention vs. 117 patients post
 - Charges for CABG patients fell 5%, 16% reduction in total LOS (not post-op LOS)
 - 30-day readmissions fell from 7.1% to 6%
 - Adherence to care elements increased from 59% to 100%
 - No change in 19 health outcomes



Example 2 PROMETHEUS Bundled Payment Demonstration

- Bundle payment based on pre-defined clinical episode
 - “evidence-informed case rates”
- 21 bundles
 - chronic and acute conditions, procedures
- Attempts to separate “probability risk” (random events) from “technical risk” (potentially avoidable complications)
 - Insure probability risk but not technical risk



PROMETHEUS designed to address anticipated feasibility issues

- Defining the services included in a bundle
- Defining the payment method
 - Formulas for sharing financial risk while redesigning care
- Implementing quality measurement
- Determining physician and hospital accountability
- Engaging physicians
- Implementing care redesign



Hussey P et al, Health Affairs, 2011

PROMETHEUS Pilot Site Experience (2008-2011)

- 5 pilot sites
 - 2 dropped out before starting
 - Financial cutbacks
 - Limited opportunity for improvement (AMI care)
 - 2 chose chronic medical condition focus, 1 chose procedure focus
 - None were able to implement contracts over 2 years



Hussey P et al, Health Affairs, 2011

PROMETHEUS Challenges

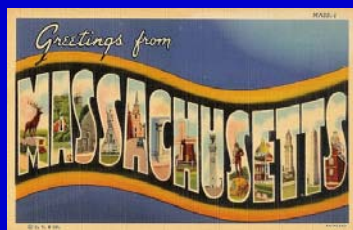
- Fee-for-service claims data and PROMETHEUS software identified erroneous “episodes, typical care, and potentially avoidable complications”
- Language barriers
 - Unfamiliar terminology, population vs. patient frame
- Skepticism about achievable goals
 - 50% reduction in potentially avoidable complications
- Inability to agree on payment incentive structure
- Where is the investment for care redesign?



Hussey P et al, Health Affairs, 2011

Example 3 BCBSMA Alternative Quality Contract (2009 – 2014)

- Combines global payment and pay-for-performance
 - 5-year contract
 - Includes downside risk
 - PCP designation mandatory (referral authorization)
 - FFS claims with year-end reconciliation
- P4P up to 10% of budget (pre-set thresholds)
- Insurer assists with regular reports on spend, utilization, quality



AQC Study Population.

Table 1. Characteristics of the Study Population.*

Characteristic	All Intervention Groups (N=380,142)		Control Group (N=1,351,446)	
	Before Implementation of AQC (2006–2008)	After Implementation of AQC (2009)	Before Implementation of AQC (2006–2008)	After Implementation of AQC (2009)
Age (yr)	34.4±18.6	35.3±18.5	35.3±18.7	35.5±18.8
Female sex (%)	52.6	51.2	51.8	51.0
Health risk score†				
Mean	1.08	1.16	1.11	1.16
Interquartile range	0.12–1.29	0.13–1.39	0.11–1.33	0.12–1.39

Song Z et al. N Engl J Med 2011;365:909-918.



Change in Average Health Care Spending per Member per Quarter in the Intervention and Control Groups

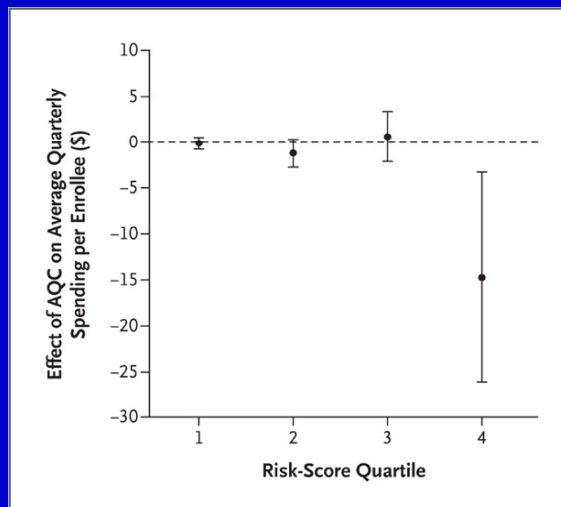
	Intervention (change)	Control (change)	Difference	P-value
Spending Category		U.S. \$		
Total quarterly	53	69	-15.51	0.009
E and M	25	27	-2.22	0.002
Procedures	10	16	-5.96	0.001
Imaging	8	11	-3.47	<0.001
Test	7	11	-3.72	<0.001
Outpatient facility	16	30	-14.50	<0.001

Non-significant spending changes: Inpatient, outpatient professional services, ancillary services



Song Z et al. N Engl J Med 2011;365:909-918.

Difference-in-Differences Estimates of the Effect of the Alternative Quality Contract (AQC) on Average Health Care Spending.



Song Z et al. N Engl J Med 2011;365:909-918.



AQC Key Insights

- AQC contract associated with modestly lower spending in year 1
- Savings primarily among high-risk enrollees
 - Not a Medicare population
- Savings generated by steering patients to organizations with lower fees
 - Not reductions in utilization
- Quality improved on included measures



Song Z et al. N Engl J Med 2011;365:909-918

Summary of Approach to Evaluation

- Independent, but closely engaged implementer and evaluator teams
- Careful specification and agreement on logic models beforehand
 - Pilot phase if feasible to establish intervention and instruments
- Rely heavily on guided interviews with multiple key informants
- “Light-touch” data collection (“PDSA-like”)



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Publishing, not Perishing

- Describe context
- Identify the novel question
- Emphasize comparison groups
- Don't oversell modest results
- Make failure interesting

