

Facilitating the Adoption of New Project Delivery Practices among AEC Project Teams

Brian Lines, PhD – University of Kansas

Anthony Perrenoud, PhD – University of Oklahoma

Kenneth Sullivan, PhD, MBA – Arizona State Univ.

Change Adoption

The extent to which the organization implements and achieves the goals, benefits, and processes of the change effort.

(Armenakis & Bedeian 1999, Beer & Eisentadt 1996, Holt et al. 2007)

Organizational Change in the AEC Industry

- **Technology:** software, BIM, safety, mobile...
- **Management:** BPR, QM Programs, APDMs, mgmt. realignment...
- **Supply Chain:** supplier relationship mgmt, industrialization/pre-con, modularization...
- **Market:** expansion, mergers, acquisitions, downsizing, flexible overhead...

Research Question

- Why (and how) are certain AEC firms able to adopt organizational change more successfully than other firms?

Research Objective

- Which change management practices are most linked with the adoption of organizational change initiatives within the AEC industry?

Gaps in the Literature

Erwin & Garmin 2009, Armenakis *et al.* 1999

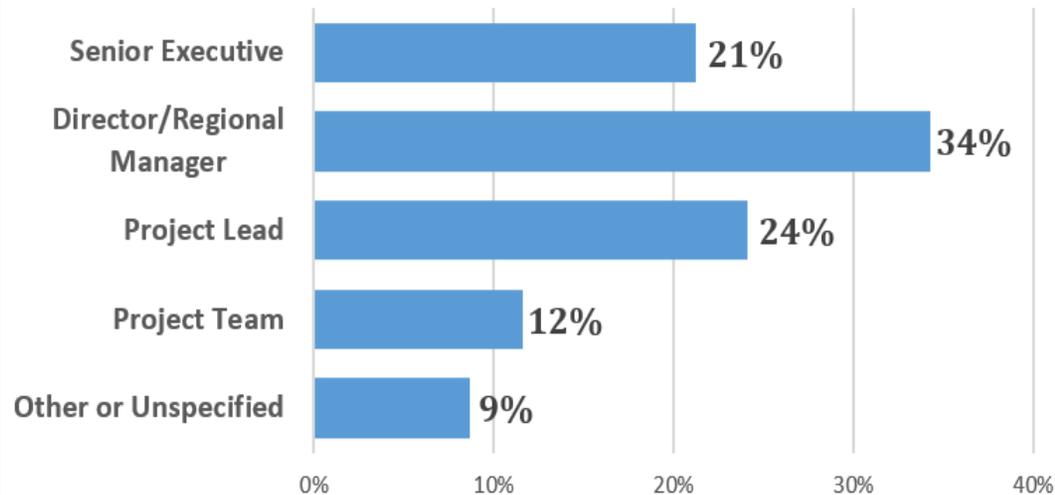
- Limitation of Research Studies from last 20 yrs
 - Primarily self-report questionnaires (surveys)
 - Retroactive data collection
 - General and theoretical analysis
 - Minimal practice-oriented guidance
- Future Research Needs:
 - Multi-Level Interventions: individual, group, org levels
 - Time: evolution over time, sequence of interventions
 - Practice-Based Methods: action research, case studies, quantitative measurements

Preliminary Study: National Survey

236 Organizational Change Initiatives

- Each represents an organization-wide change
- Architecture, Engineering, Construction, Owners
- Respondents averaged 29 years of **experience**

Hierarchical Position of Repondents



Organizational Changes within the Data Sample

- Lean Implementation
- BIM adoption
- Industrialized construction
- Project controls technology
- Supplier relations mgmt. system
- Change in marketing strategy
- Smart plant implementation
- Formal PM execution processes
- Customer relations mgmt. system
- Materials tracking upgrade
- Enterprise resource planning
- Document management systems
- Business structure reorganization
- *And many, many more...*

Change Management Practices

Top 5 :

1. Effectiveness of the Change Champions.
2. Individual Employees understand “WIFM?”
3. Measurement of Clear Performance Goals.
4. Realistic Implementation Timescale.
5. Employees understand the action steps
6. Visible Senior Leadership Commitment.

Research Design

- **Consistency in the change (all the same Project Delivery Change)**
- 16 organizations (14 public, 2 private)
- 48 project teams, two individuals each ($N = 96$)
- Top Change Management Practices
- Other Project & Personnel Parameters

Change Adoption

Hierarchical Multiple Regression

$R^2 = .439$; $F[34.823]$, $p < .001$

Predictor	b	β	RW	CI-L	CI-U	RS-RW
Intercept	2.499					
Change Agent Involvement	0.525*	0.588	0.3858*	0.2367	0.5262	82.92%
Project Duration	-0.381*	-0.252	0.0795*	0.0216	0.1664	17.08%

Predictor	Relative Weight Analysis
Change Agent Involvement	38.6%
Project Duration	7.9%

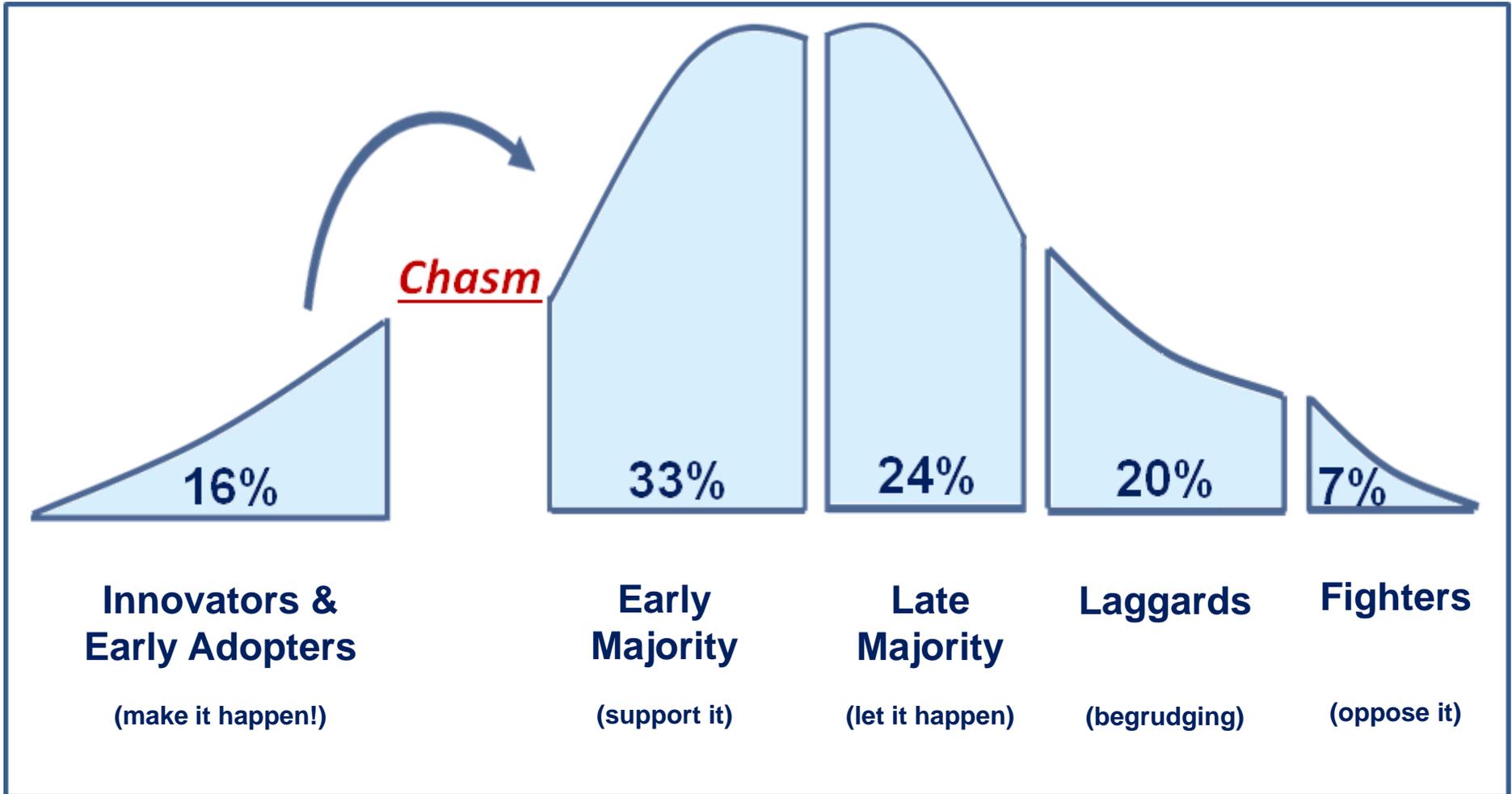
N = 96

Change Readiness

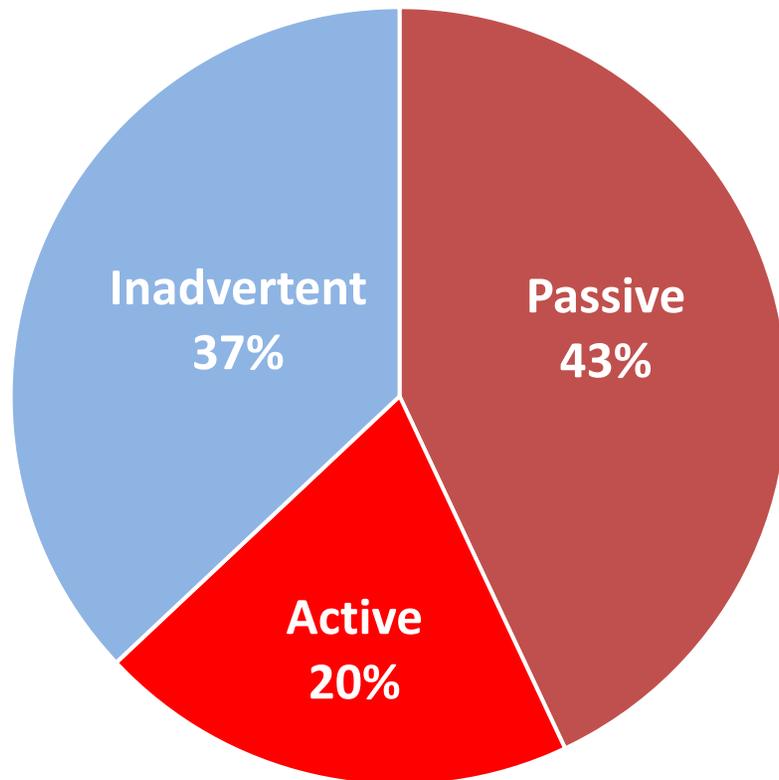
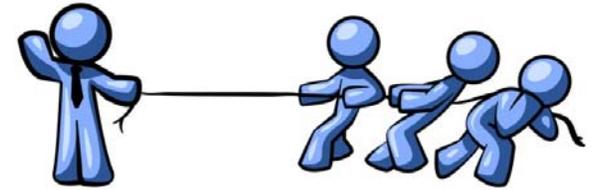
The extent to which employees hold *positive views* about the need for organizational change (acceptance).

(Jones et al. 2005)

Organizational Change Adoption



Resistance to Change



Top 4 Types of Resistance

1. Reversion
2. Reluctant Compliance
3. Arguing
4. Lack of Transparency

Research Findings

People

- Effective Change Agents Reduce Resistance by 7x
- 10-20% will Embrace the Change Upfront
- 10-25% will Oppose, Undermine, Avoid, Delay

Education & Implementation Plan

- Jumping in without Proper Training = 8x more Resistance
- Lacking a Strategic Vision leads to 6x More Resistance

Measurement & Accountability

- Transparency Systems during implementation have Doubled Operational Performance

Importance to the Industry



- Ability to adopt change directly impacts the firm's bottom-line.
- Becoming an *Early Adopter*.
 - Faster to Market
 - More Effective = Less Resistance
 - Less Resistance = Less Time, Energy, Resources

Thank you!

Correlation Analysis

	Project Characteristics			Personnel Characteristics		Organizational Expectations		Implementation Approach		Dependent Variables	
	Project Type	Project Value	Project Duration	Position Level	Career Stage	Implementation Duration	Organizational Shift	Change Message Delivery	Change Agent Involvement	Change Readiness Level	Change Adoption Level
Proj. Type	1.000										
Proj. Value	.131	1.000									
Proj. Duration	.392**	.597**	1.000								
Position	-.150	.023	.107	1.000							
Career Stage	-.113	.111	-.002	.511**	1.000						
Impl. Speed	.015	-.138	-.009	-.142	-.215*	1.000					
Change Magn.	.126	.159	.207*	.122	-.145	.460**	1.000				
Message Deliv.	-.070	-.038	.049	.041	-.024	.369**	.262**	1.000			
Change Agent	-.284**	-.250*	-.111	.146	-.058	.339**	.247*	.558**	1.000		
Readiness	-.297** ^a	-.227** ^b	-.177 ^c	.310** ^d	.167 ^e	.250** ^f	.192 ^g	.561** ^h	.604** ⁱ	1.000	
Adoption	-.253** ^A	-.337** ^B	-.318** ^C	.149 ^D	.034 ^E	.301** ^F	.206** ^G	.446** ^H	.663** ^I	.838**	1.000

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

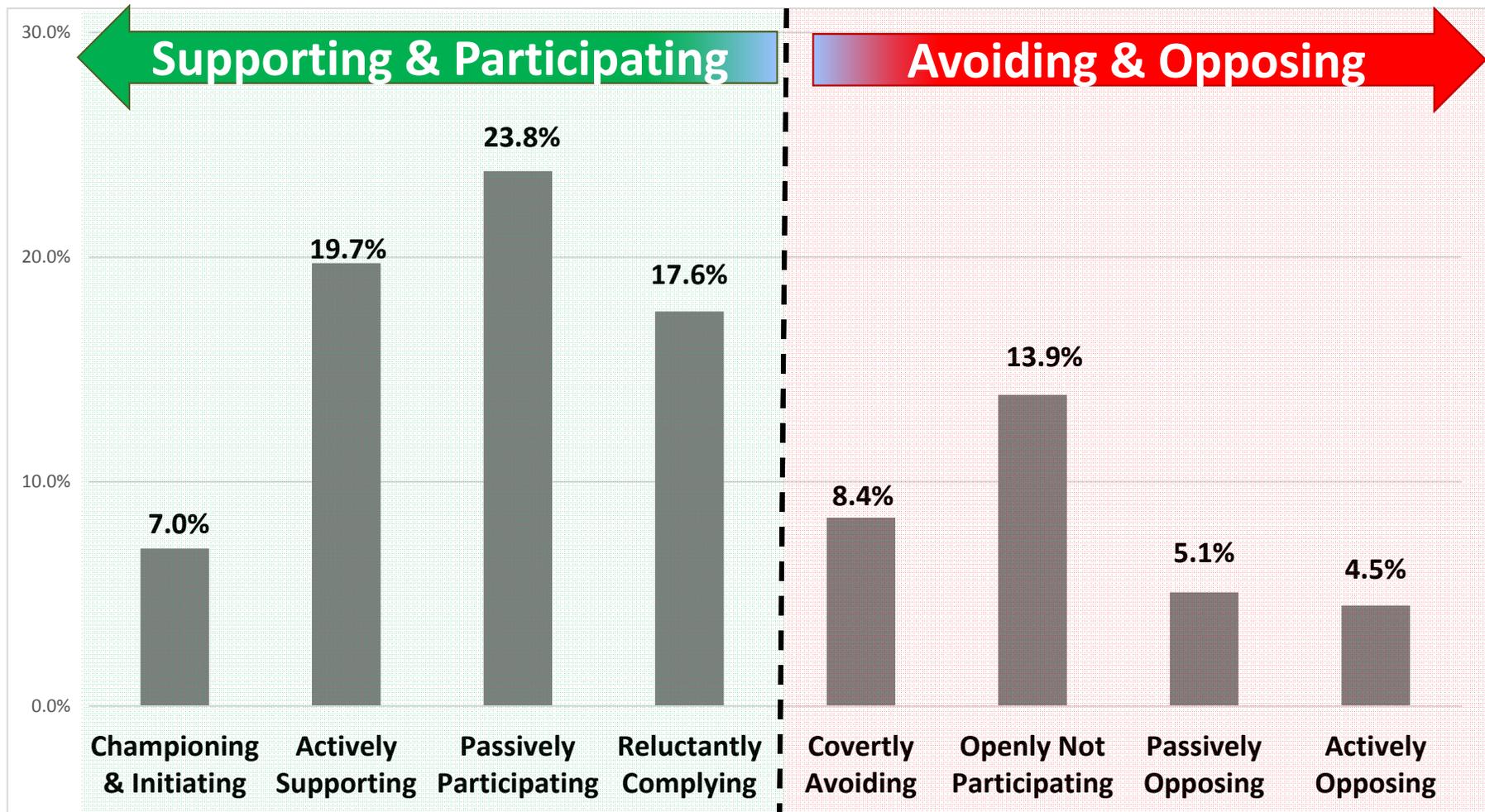
Identifying Personnel

- Early Career stage personnel display less than half the resistance of more experienced personnel.
- Mid-Career Stage personnel display the most.
- Personnel at the Supervisor level exhibit half the resistance of Front-Line or Executive personnel.

Benchmarking Change Adoption in the AEC Industry

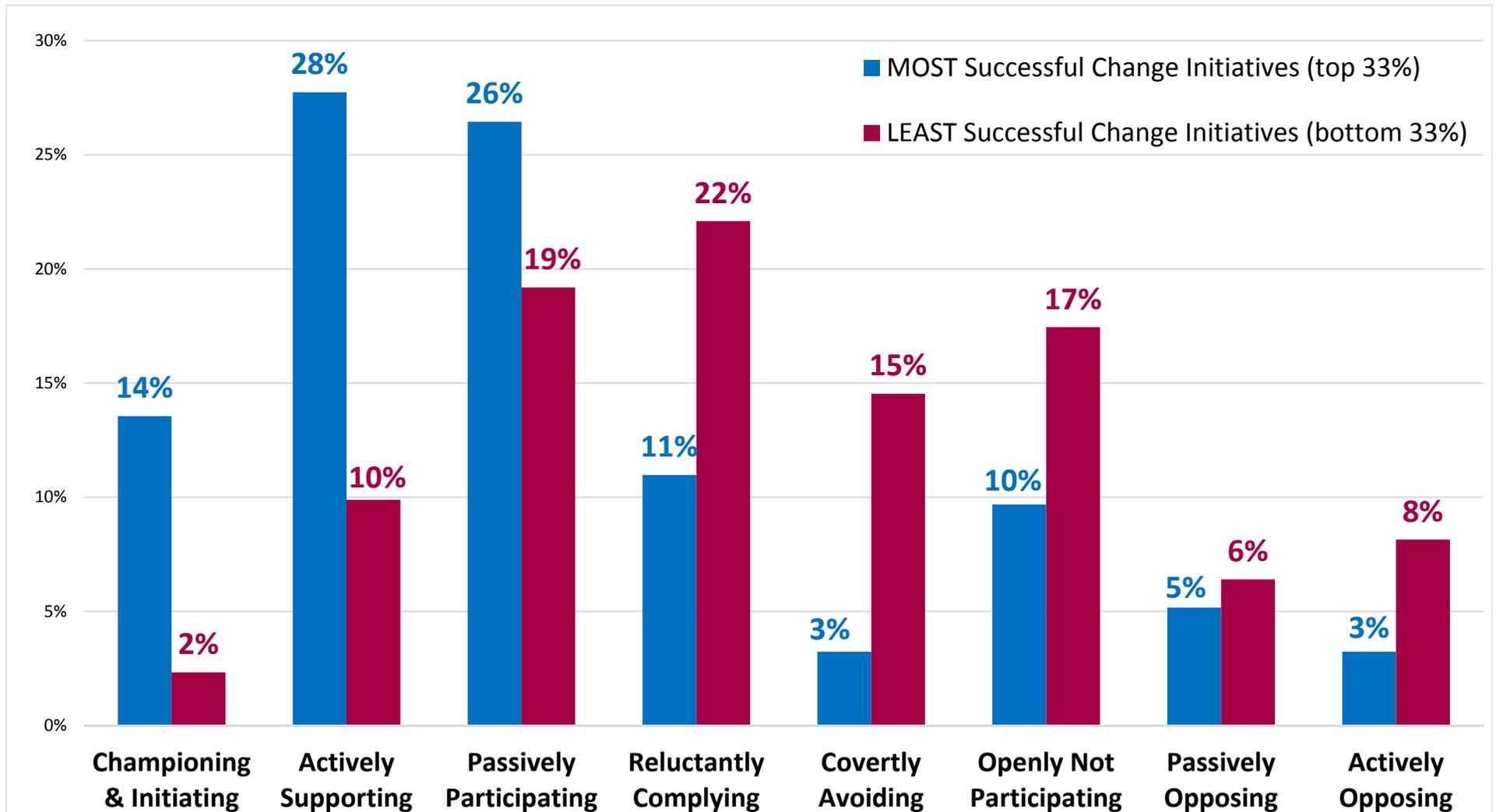
International Survey

Personnel Reactions to Change

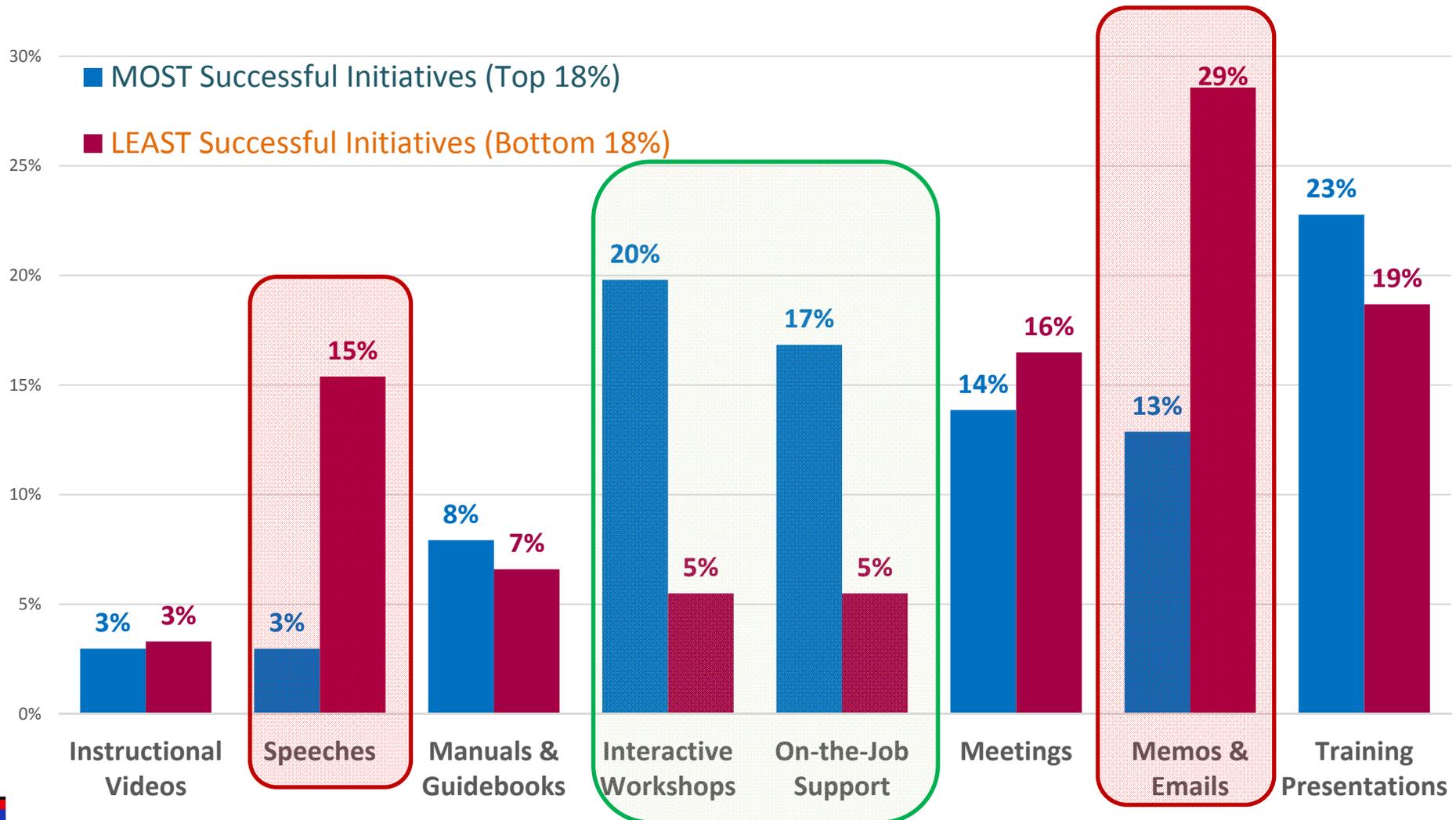


N=234

Personnel Reactions to Change

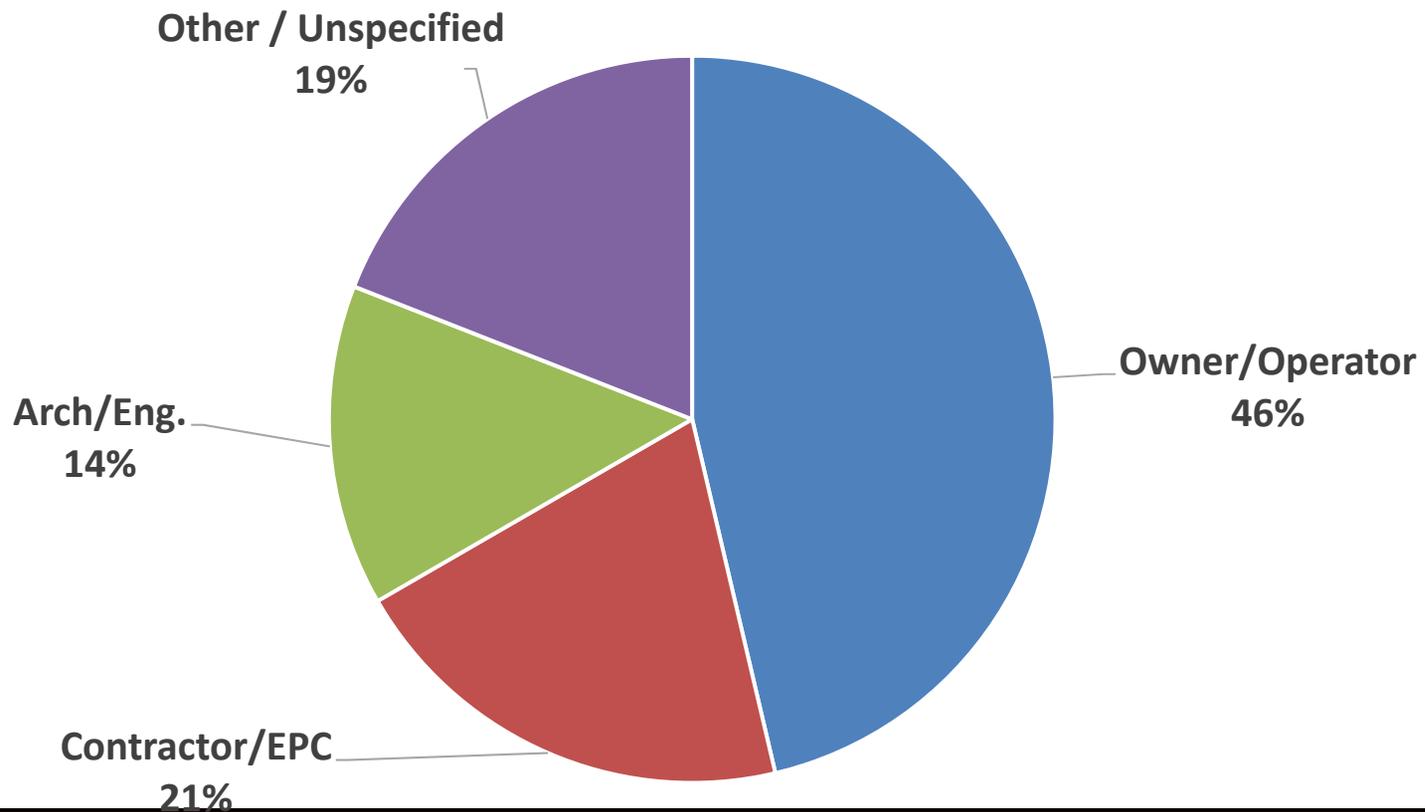


Communicating the Change Message



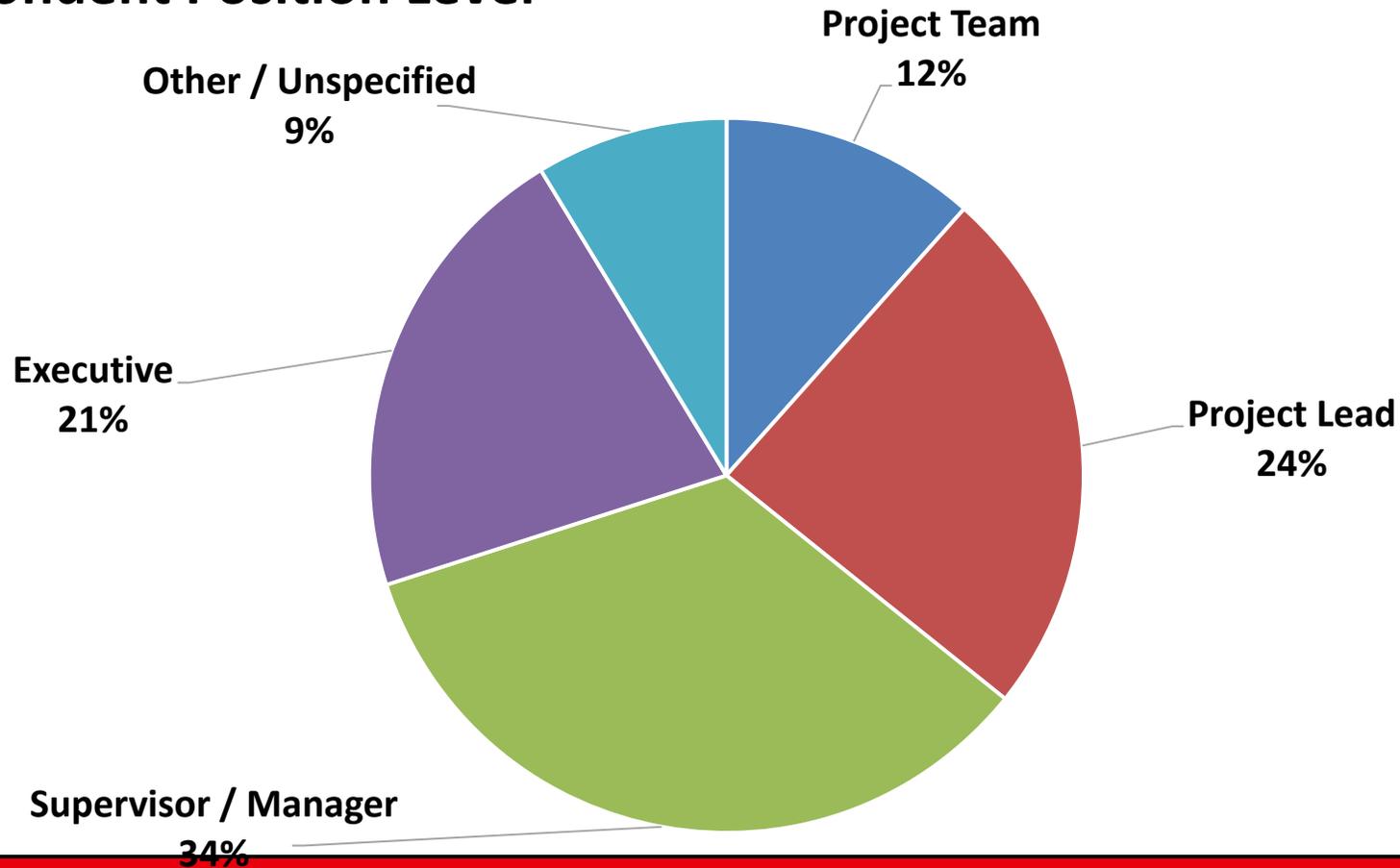
Survey Demographics

Organization Type



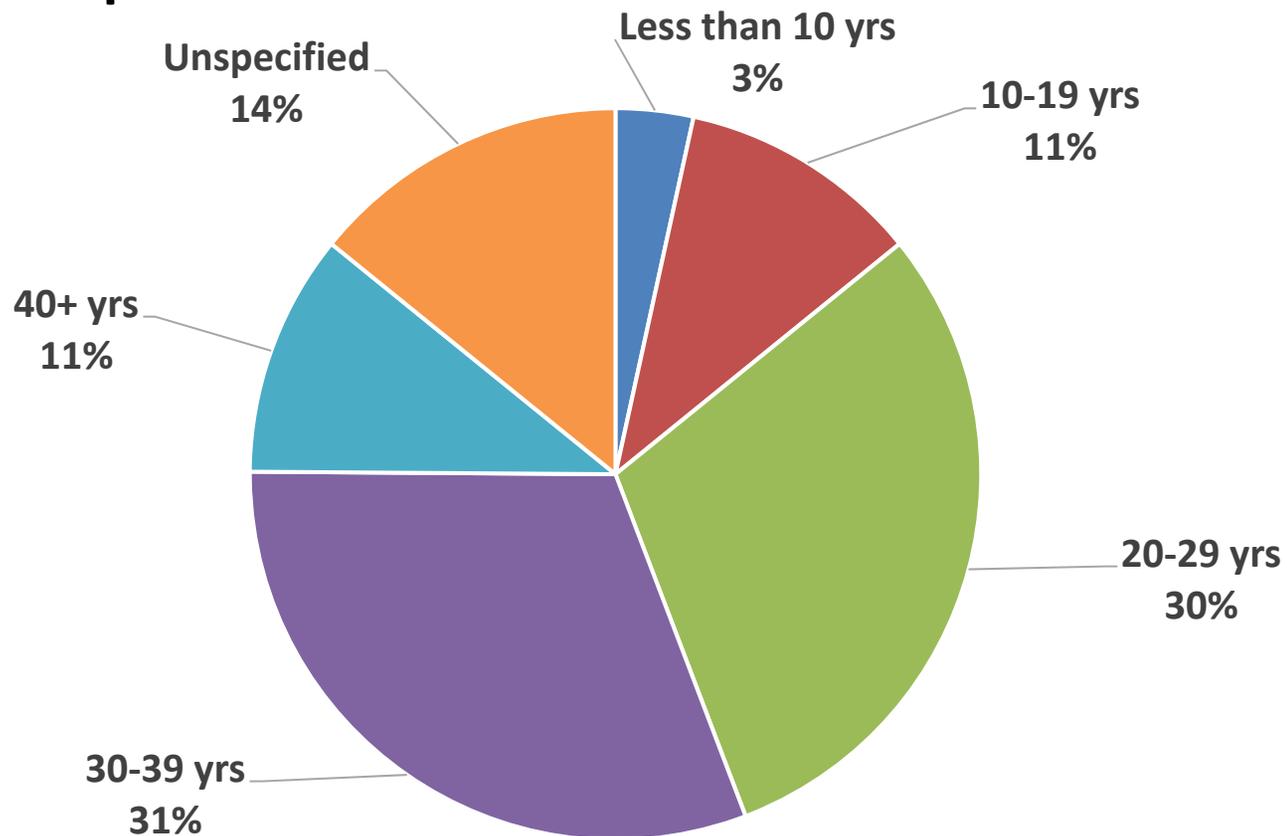
Survey Demographics

Respondent Position Level

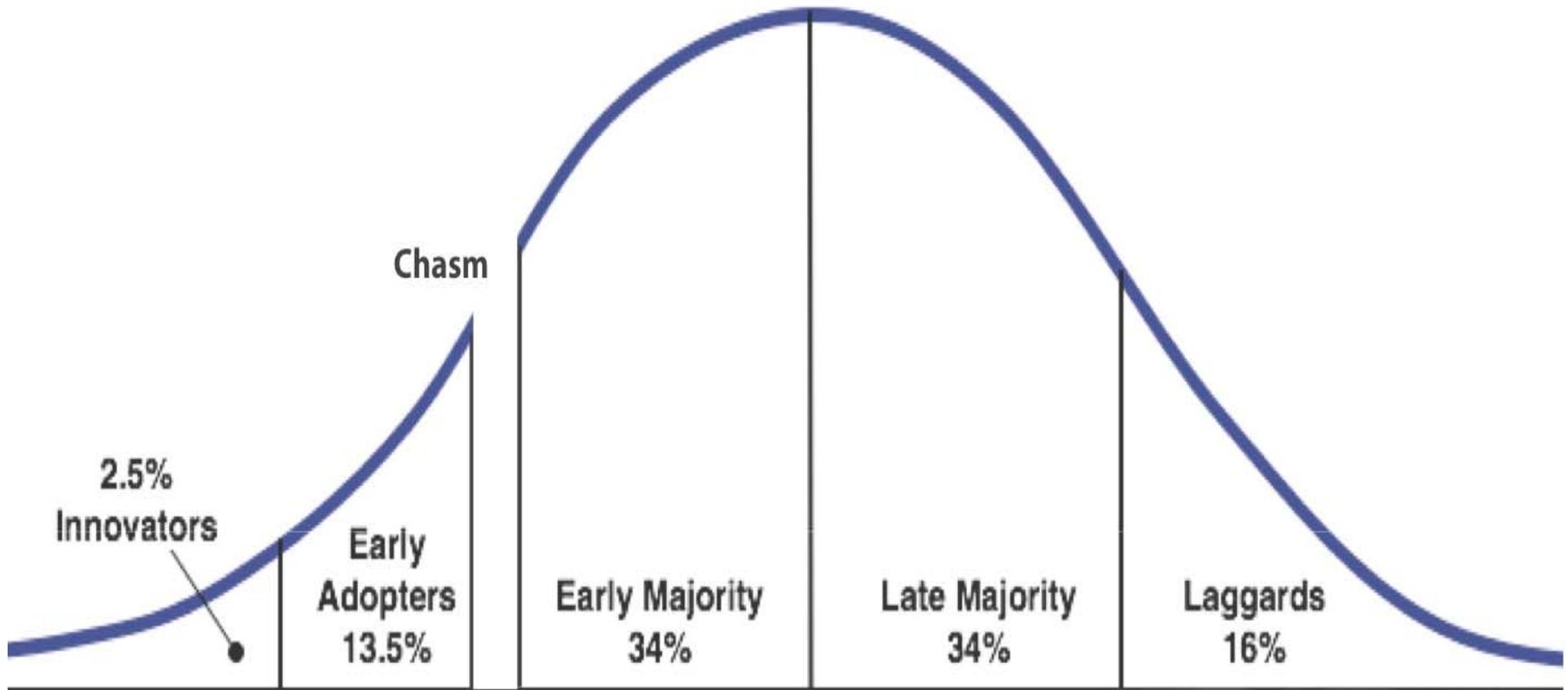


Survey Demographics

Respondent Experience



Diffusion of Innovation



Rogers 1962