Foundations of Software Engineering 605.601
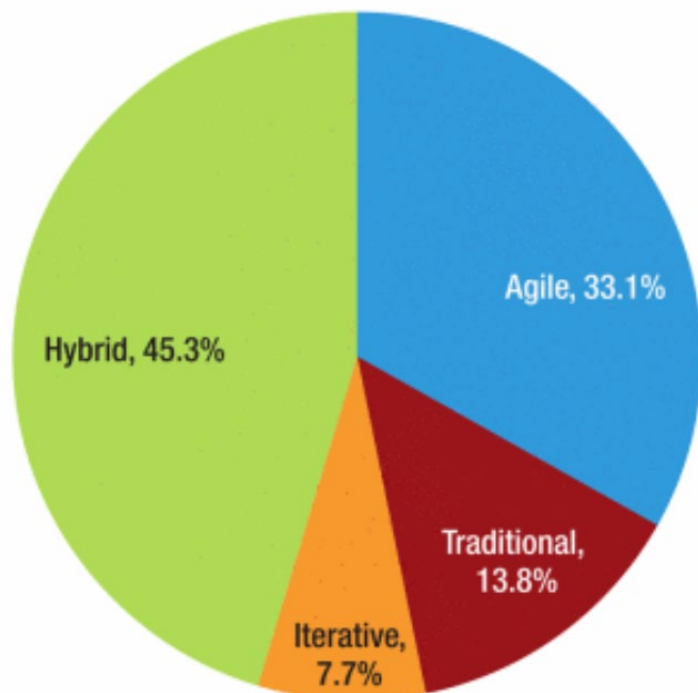
Impact of Project Characteristics on the Choice of Development Approach
&
Trends in Modern Project Delivery

Johns Hopkins University
Whiting School of Engineering
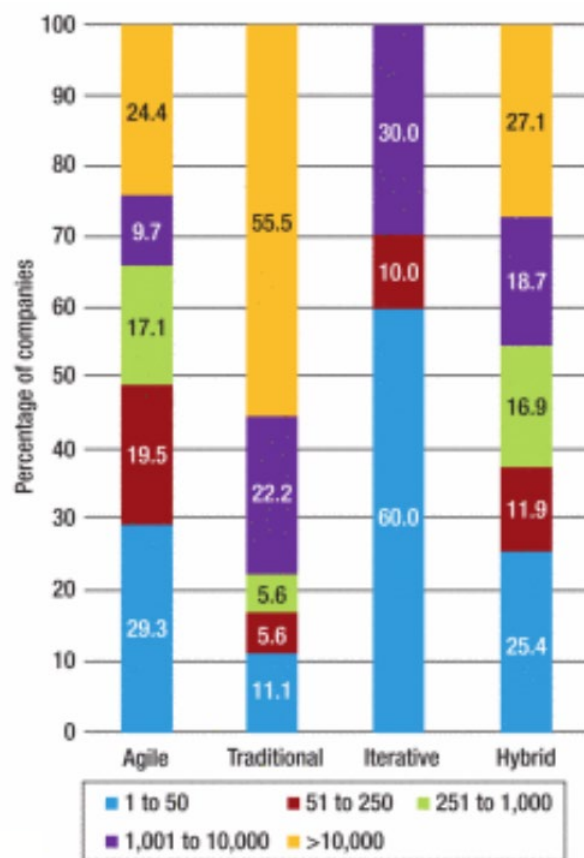**Engineering for Professionals**

Joseph M. Demasco
2024

Summary of Development Approaches

Pie chart: Agile, 33.1%; Hybrid, 45.3%; Traditional, 13.8%; Iterative, 7.7%

- Survey of 153 respondents from many different business sectors
- 133 U.S. respondents
- 39% new projects
- 24% enhancements
- 13% COTS
- 10% system integration
- 7% migration
- 7% other

Vijayasarathy, L.R., Butler, C.W., Choice of Software Development Methodologies: Do Organizational, Project, and Team Characteristics Matter?, IEEE Software, Volume 33, Issue 5, Sep-Oct 2016
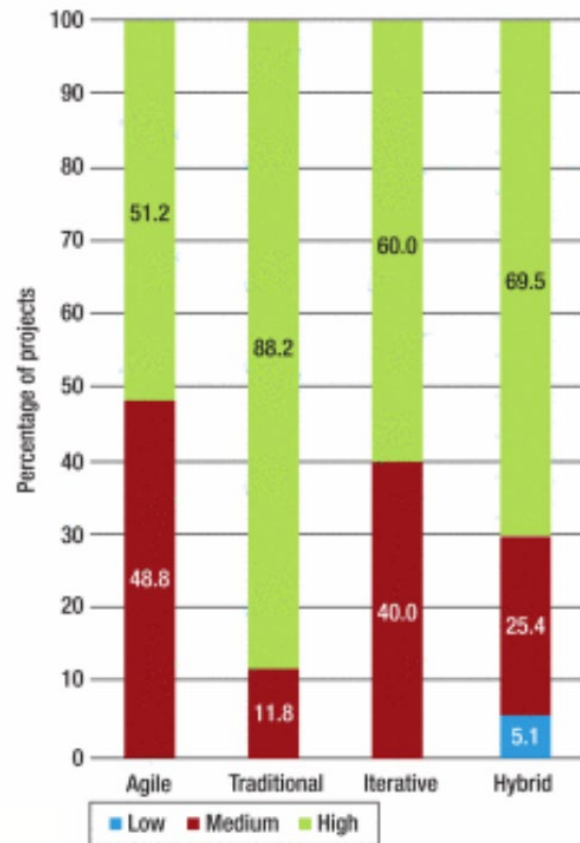
Approach Based on Number of Employees

- Companies with high employee counts were the dominant group for traditional approaches
- Companies with low employee counts were the dominant group for iterative and agile approaches

Vijayasarathy, L.R., Butler, C.W., Choice of Software Development Methodologies: Do Organizational, Project, and Team Characteristics Matter?, IEEE Software, Volume 33, Issue 5, Sep-Oct 2016

Approaches Based on Project Criticality

- Organizations tend to use traditional approaches on high criticality projects…followed by hybrid, iterative, and agile approaches

Vijayasarathy, L.R., Butler, C.W., Choice of Software Development Methodologies: Do Organizational, Project, and Team Characteristics Matter?, IEEE Software, Volume 33, Issue 5, Sep-Oct 2016
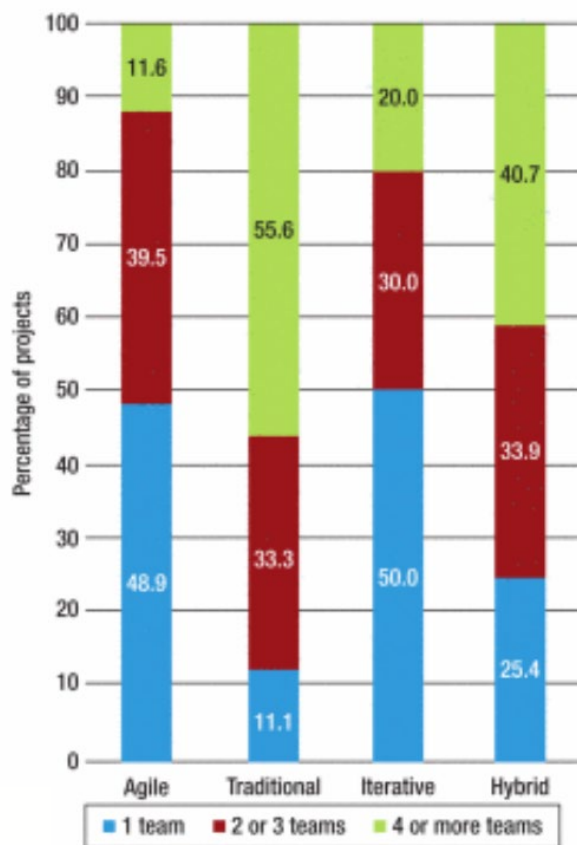
Approaches Based on Project Teams

- Projects with 1 team were the most prevalent for agile and iterative approaches

- Projects with 2-3 teams were distributed fairly equally across all approaches

- Projects with 4 or more teams were the most prevalent with traditional and hybrid approaches

Vijayasarathy, L.R., Butler, C.W., Choice of Software Development Methodologies: Do Organizational, Project, and Team Characteristics Matter?, IEEE Software, Volume 33, Issue 5, Sep-Oct 2016
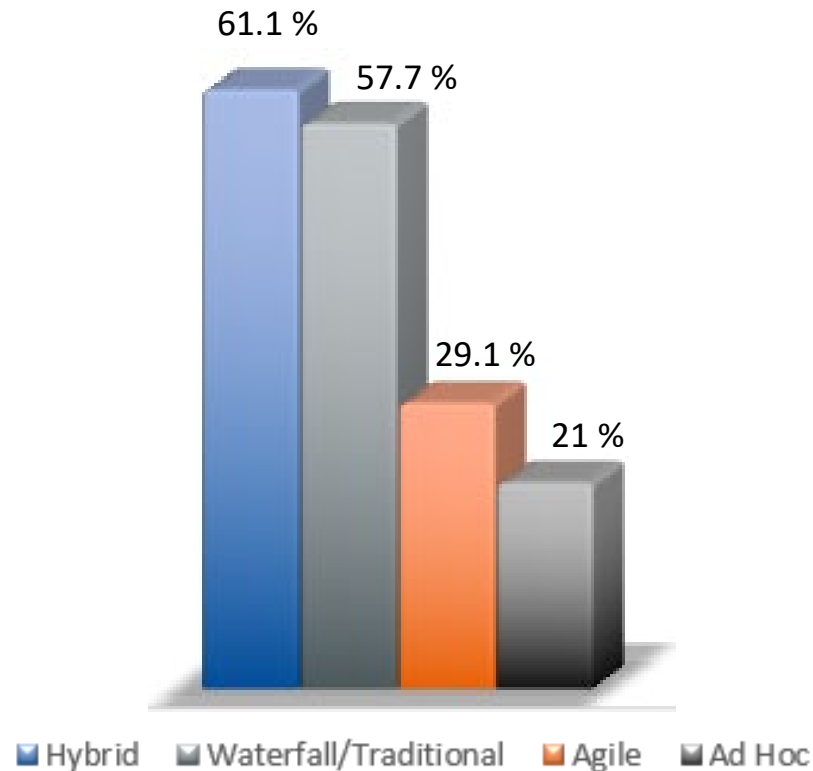
Project Characteristics and Approaches

Approach	Characteristics		
	Organizational	Project	Team
Agile	Moderate revenue A small number of employees	Low budget Medium to high criticality	One team Small team
Traditional	High revenue A large number of employees	High budget High criticality	Multiple teams Medium team
Iterative	A small number of employees	Medium budget Medium to high criticality	One team Small team
Hybrid	Organization size unimportant	Medium budget High criticality	Small team

Vijayasarathy, L.R., Butler, C.W., Choice of Software Development Methodologies: Do Organizational, Project, and Team Characteristics Matter?, IEEE Software, Volume 33, Issue 5, Sep-Oct 2016

Trends in Modern Project Delivery

Trends in Modern Project Delivery, Project Management Institute & Wrike Inc., 2021

When Hybrid Approaches Work Best

- Diverse stakeholder needs
- Varied project phases
- Uncertain requirements
- Risk management
- Complex project structures

Nieto-Rodriguez, A., It's Time to End the Battle Between Waterfall and Agile, Harvard Business Review, October 2023