



PROJECT MANAGEMENT CENTER FOR EXCELLENCE

A.J. CLARK SCHOOL OF ENGINEERING
Civil & Environmental Engineering Department



AGILE QUANTITATIVE RISK ANALYSIS

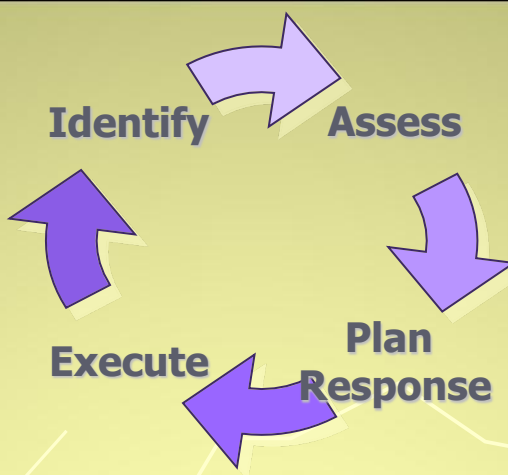
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2018 Project Management Symposium



Agile Quantitative Risk Analysis

Presented by: Susan Parente

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Objectives

- ▶ What is Agile?
- ▶ What is Project Risk Management?
- ▶ What is Agile Risk Management?
- ▶ Risk Analysis for Agile
- ▶ Recommendations for Implementing
- ▶ Risk as an Opportunity!!!

What is Agile?

- ▶ Principles that guide teams
- ▶ Principles that guide development
- ▶ A culture shift
- ▶ A great solution for some types of projects
- ▶ Open Communication: between teams, stakeholders and customers
- ▶ Different from traditional project management

Agile Project Management

The Agile Manifesto

"We are uncovering better ways of developing software by doing it and helping others do it.

Through this work we have come to value:

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

*That is, while there is value in the items on the right, we value the items on the left more."**

Agile Project

- ▶ Rolling Wave Planning
- ▶ Iterative or Incremental Delivery
- ▶ Rapid and Flexible Response to Change
- ▶ Open Communication

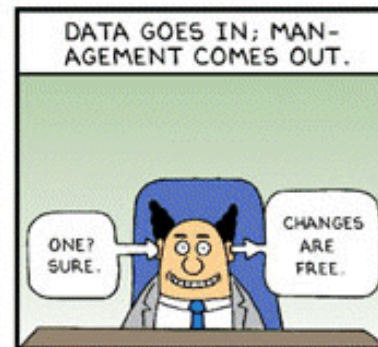
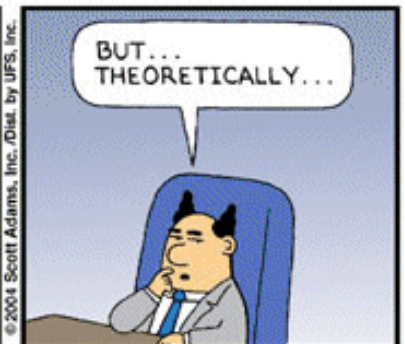
Agile Methodologies or Frameworks:

- Scrum, XP (eXtreme Programming), Lean and Test-driven Development (TDD), Kanban, & ...

What is Agile?

Dilbert

by Scott Adams



Why Agile?

- ▶ Agile Principles and Practices, Used to:
 - Manage Change
 - Improve Communication
 - Reduce Cost
 - Increase Efficiency
 - Provide Value to Customers and Stakeholders
 - Decrease Project Risk



When use Agile?

Consider using an agile approach when 1 or more of these conditions are present:

► Uncertainty

- particularly in requirements and changing conditions

► Complexity

- content, integration, stakeholder mgmt., solution

► Innovation

- new technology, content or system

► Urgent

- high priority, short timeline

Comparing Traditional to Agile

The Triple Constraint: time, cost, scope

Traditional Project Process:

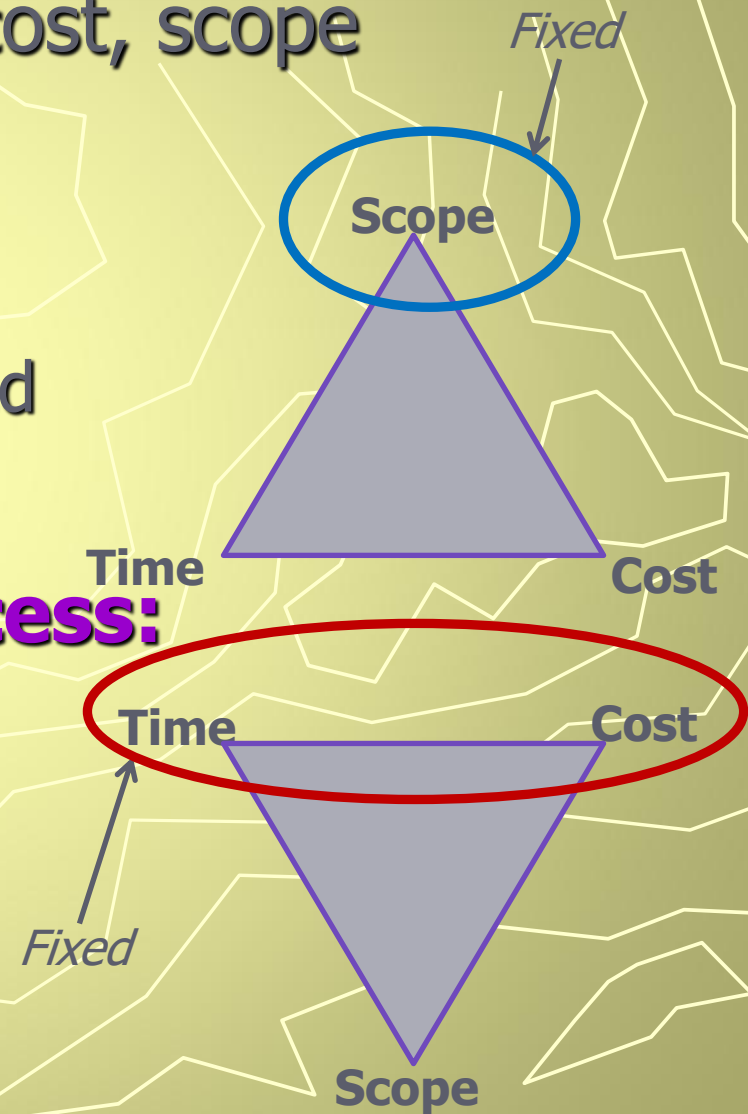
Plan Driven

- Cost and Schedule are estimated
- Requirements are fixed

Agile/ Adaptive Project Process:

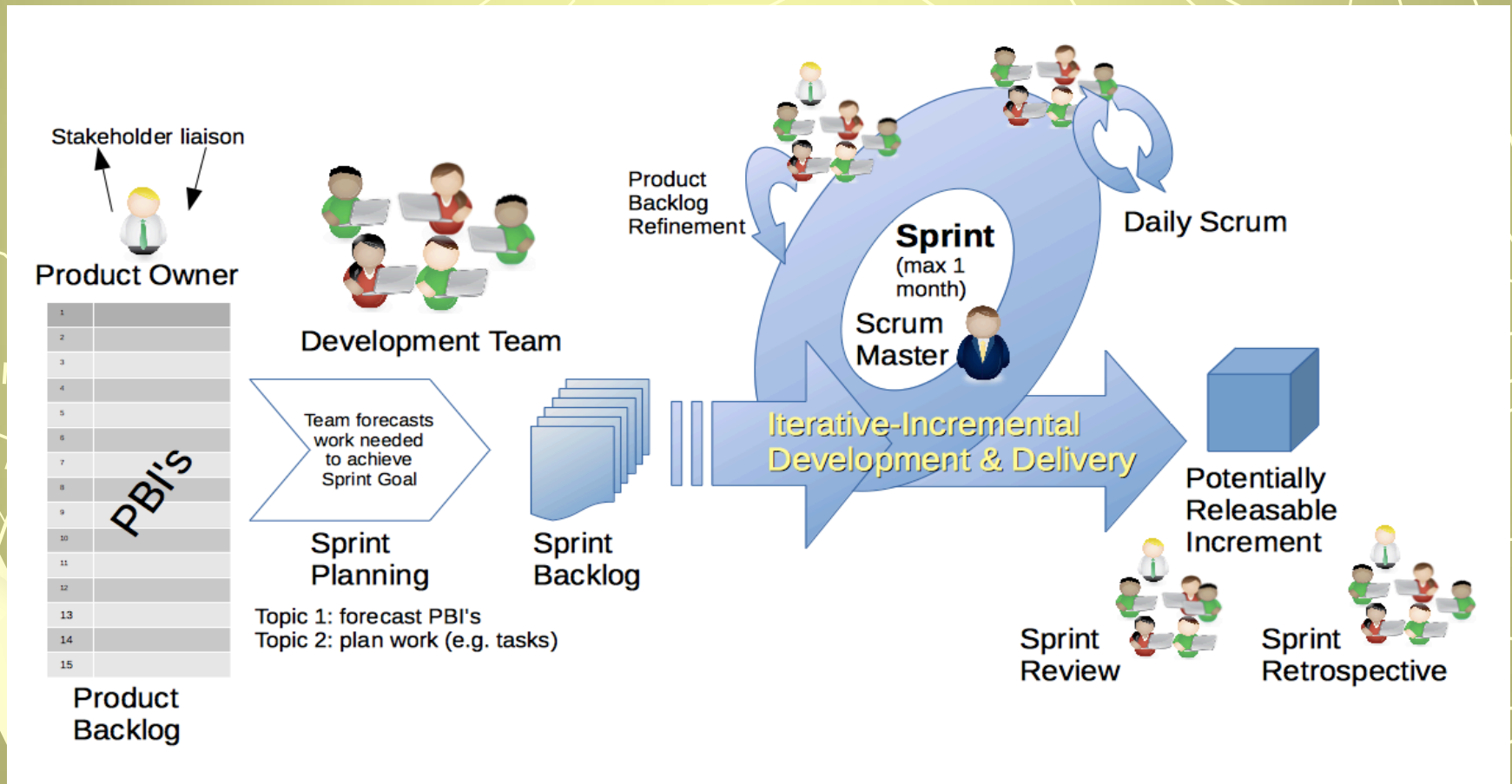
Value Driven

- Features are estimated
- Cost and Schedule are fixed

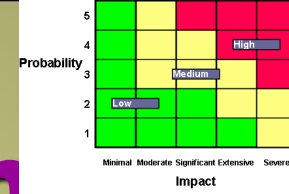


Agile Scrum

What is Scrum?



*Reference: Mitchell, Dr. I. (11/9/2015) Schematic of the Scrum Framework process. Retrieved from: https://commons.wikimedia.org/wiki/File:Scrum_Framework.png



Project Risk Management

- ▶ Project Risk Management is an organized, systematic decision-making process that efficiently *plans, assesses, handles, monitors, and documents* risk to increase the likelihood of achieving project goals and decrease the likelihood that a risk would become a future problem

Project Risk Management Process

► Identification

- Discovery of a potential risk

► Assessment

- Review, analysis, and prioritization

► Response Planning

- To mitigate, avoid, transfer or assume assessed risks

► Execution

- Of response strategies, as determined in response planning

Planning, Monitoring, Documentation and Communication

- Foundations of the RMP, essential to all phases
- Part of continuous process improvement for the RMP



Agile Risk Management

- ▶ Agile RM is inherent in 'Inspection and Adaptation'
- ▶ Focus on maximizing value (opportunity), in addition to minimizing threats
- ▶ Regular and iterative inspection (retrospective)
- ▶ Regular capturing of lessons learned





Agile Quantitative Risk Mgmt.

- ▶ Agility is our ability to respond to change
- ▶ The focus of Agile is Value
- ▶ Software Development Performance Agility
 - ▶ *Response Efficiency*
 - ▶ Time, Cost, resources to respond to changes
 - ▶ *Response Extensiveness*
 - ▶ 80% of changes are incorporated

(Important to measure this effectiveness)

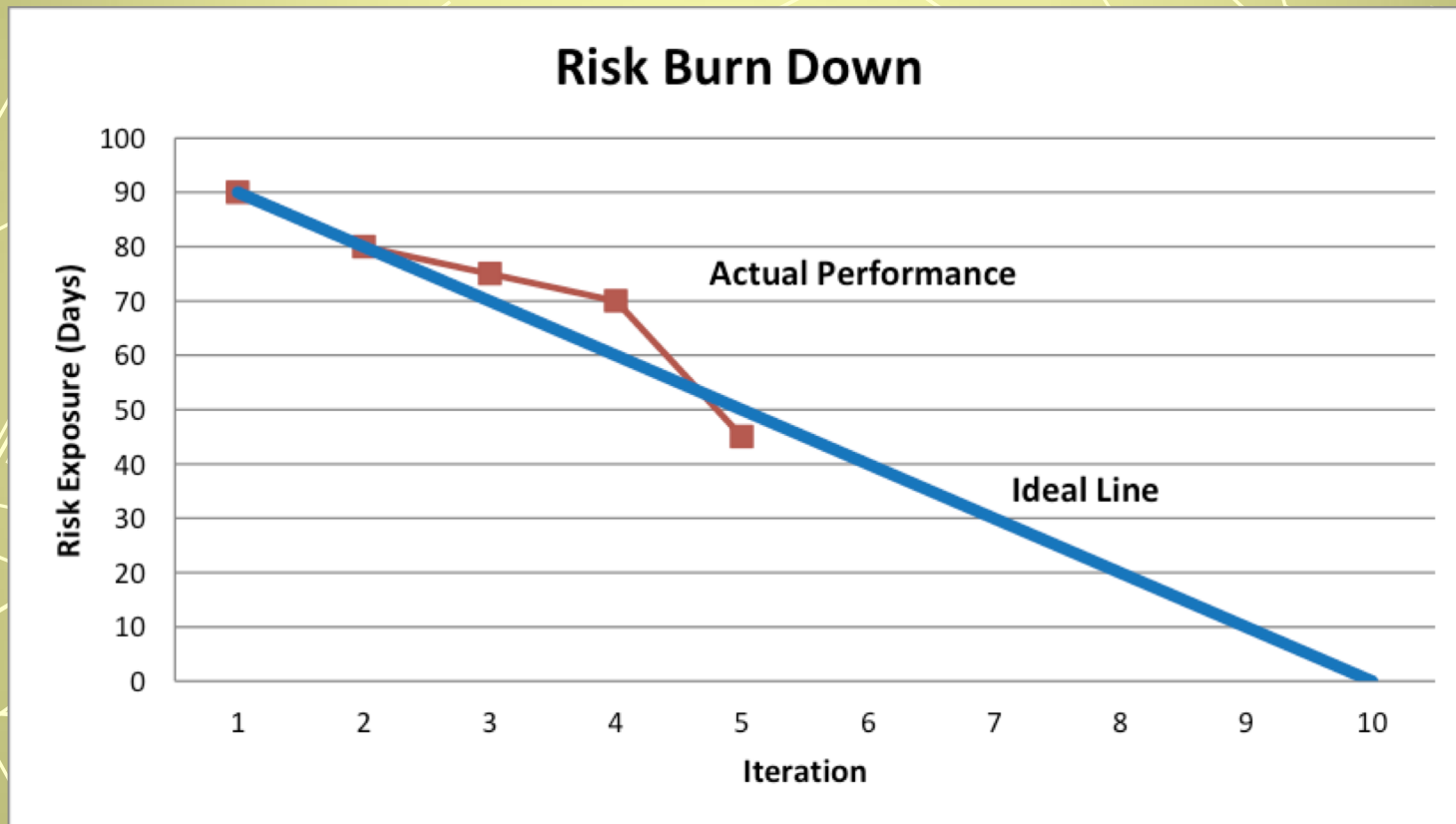


Agile Risk Management

- ▶ Risk Management is **built into Agile Practices**

- ▶ RM is integrated in Agile, but **not transparent**
- ▶ Risk is constantly reviewed

- ▶ **Risk relates to Value** (evaluate these together)
- ▶ View and adjust the Backlog based on Risk
- ▶ Risk Burn Down Chart
 - As the project progress risk decreases

Agile Risk Management

Tracking Project Risk



Cagley, T., (10/42013) Agile and Risk Management: Prioritization and Measurement Techniques, Part 2, Retrieved from: <https://tcagley.wordpress.com/2013/10/04/agile-and-risk-management-prioritization-and-measurement-techniques-part-2/>

Agile Risk Management

RELAX, LOOK AHEAD



Agile Risk Management

Team Assessment...



Of the Team and by the Team

Agile RM Implementation

- ▶ Risk Identification by *everyone* on the team!
- ▶ Being *conscious* of risk
- ▶ Being *intentional* about risk planning
- ▶ Risk Assessment (*separate from identification*)
- ▶ Planning:
 - Use Iteration Planning Meetings to manage iteration risks
 - Team communicates with Customer- escalating high risks
 - Work with the Customer to identify concerns and reduce risk

Agile RM Implementation

► Iteration Planning

- Evaluate Risks for each iteration
- For the next 2-3 iterations
- Risk Adjusted Backlog

► Daily Standup Meetings

- Risk Response **Planning** from barriers denoted in daily stand-up

► Spike

- Quick Experiment/ Investigation
- For risk response planning

► Iteration Review/ Retrospective

- How were risk **successful** handled?
- What risk were **not Identified**?
- What risk responses, or process could be **used in the future**?



Agile Risk Management

- ▶ Agile Principles and Practices, used to:
 - Manage Change
 - Improve Communication
 - Reduce Cost
 - Increase Efficiency
 - Provide Value to Customers and Stakeholders
 - Decrease Project Risk



Agile Risk Management

- ✓ **Project Risk Management** is an organized, systematic decision-making process that efficiently *plans, assesses, handles, monitors, and documents* risk to increase the likelihood of achieving project goals and decrease the likelihood that a risk would become a future problem.
- ✓ **Agile Risk Management** is about incorporating risk management into the Agile framework as part of the iterative process to increase the likelihood of achieving product goals and decrease the likelihood that a risk would become a future problem.
- ✓ **Risk Management is everyone's job!**

That means you!

Risk Management

*Everyone wants to be doing it. Every
thinks everyone else is doing it.*

*Not many people are actually doing
it, and no one is doing it
particularly well...*

Agile Risk Management

References:

- ▶ Cagley, T., (10/42013) *Agile and Risk Management: Prioritization and Measurement Techniques, Part 2*, Retrieved from: <https://tcagley.wordpress.com/2013/10/04/agile-and-risk-management-prioritization-and-measurement-techniques-part-2/>
- ▶ Hamilton-Whitaker (2011) "Agile Risk Management for Projects and Pro-grammes", Canada
- ▶ Lee, G., & Xia, W. (3/2010) "Toward Agile: An Integrated Analysis of Quantitative and Qualitative Field Data on Software Development Agility", *MIS Quarterly*, Vol 34 #1
- ▶ PMI. *A Guide to the Project Management Body of Knowledge (PMBOK)*. New-town Square, PA: Project Management Institute, Inc., Sixth Edition, 2017.
- ▶ Sliger, M (2011) "Relating PMBOK Practices to Agile Practices", Retrived from: <http://www.stickyminds.com/sitewide.asp?Function=edetail&ObjectType=COL&ObjectID=11133>

Agile Risk Management



QUESTIONS?

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Agile Risk Management

For discussion and resources on Risk Management...

Please join us on  in the

Risk Management Implementation Group

<http://www.linkedin.com/groups?mostPopular=&gid=3442533>

Agile Risk Management Group

http://www.linkedin.com/groups?gid=4020498&trk=myg_ugrp_ovr

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Likelihood of Occurrence	Consequence of Occurrence			
	1 - Minimal	2 - Moderate	3 - Significant	4 - Extreme / Severe
Very High 5	High	Very High	Very High	Very High
High 4	Medium	High	High	High
Medium 3	Low	Medium	Medium	Medium
Low 2	Very Low	Low	Low	Low
Very Low 1	Very Low	Very Low	Very Low	Very Low



Additional Information



Additional Information

PMI-RMP® Certification



PMI-RMP® Certification

PMI Risk Management Professional (PMI-RMP)®

- "PMI's Risk Management Professional (PMI-RMP)® credential is a response to project management's increasing growth, complexity and diversity. Globally recognized and demanded, the PMI-RMP® fills the need for a specialist role in project risk management."
- "It recognizes your unique expertise and competency in assessing and identifying project risks, mitigating threats and capitalizing on opportunities, while still possessing a baseline knowledge and practical application in all areas of project management."

Reference: PMI, "PMI Risk Management Professional (PMI-RMP)" Retrieved from:
<https://www.pmi.org/certifications/types/risk-management/rmp>

PMI-RMP® Certification

Who should apply:

- Risk management specialists and Project Risk Managers
- To increase your skills in project management
- To highlight your specialized expertise to employers

PMI-RMP Requirements:

- A 4 year degree (bachelor's or the global equivalent), with at least 3,000 hours of project RM experience and 30 hours of project RM education.

OR

- A secondary diploma (high school or the global equivalent) with at least 4,500 hours of project RM experience and 40 hours of project RM education.

Reference: PMI, "PMI Risk Management Professional (PMI-RMP)" Retrieved from:
<https://www.pmi.org/certifications/types/risk-management-rmp>

PMI-RMP® Certification

How to Apply:

- Online at www.pmi.org
- More Info:
 - PMI-RMP Handbook
 - PMI-RMP Exam Preparation

Maintain Your PMI-RMP:

- Earn 30 PDUs/ 3 year cycle in project risk management
- Learn more at: <https://www.pmi.org/certifications/types/risk-management-rmp>

Reference: PMI, "PMI Risk Management Professional (PMI-RMP)" Retrieved from:
<https://www.pmi.org/certifications/types/risk-management-rmp>

Additional Information

PMI-ACP® Certification



PMI-ACP® Certification

PMI Agile Certified Practitioner (PMI-ACP)®

- ▶ “PMI’s Agile Certified Practitioner (PMI-ACP)® credential is a response to project management’s increasing
- ▶ “The PMI-ACP recognizes knowledge of agile principles, practices and tools and techniques across agile methodologies.” (PMI, 2014)

By earning the PMI-ACP®, practitioners can:

- ▶ Demonstrate to employers their level of professionalism in agile principles, practices, tools and techniques.
- ▶ Increase their professional versatility in project management tools and techniques.
- ▶ Hold a certification that is more credible than existing offerings based only on exams or training.

Reference: PMI, “PMI Agile Certified Practitioner (PMI-ACP)” Retrieved from:
<https://www.pmi.org/certifications/types/agile-acc>

PMI-ACP® Certification

Who should apply:

- ▶ If you already use agile practices or your organization is adopting agile methods, earning the PMI Agile Certified Practitioner (PMI-ACP)® certification will demonstrate your knowledge of and commitment to this rapidly growing approach to project management.

PMI-ACP Requirements:

General Project Experience

- ▶ 2,000 hours working on project teams (within the last 5 years), or an active PMP®

Agile Project Experience

- ▶ 1500 hours working on agile project teams or with agile methodologies (within the last 3 years)

Education

- ▶ 21 contact hours in agile practices

Reference: PMI, "PMI Agile Certified Practitioner (PMI-ACP)" Retrieved from:
<https://www.pmi.org/certifications/types/agile-acc>

PMI-ACP® Certification

How to Apply:

- Online at www.pmi.org
- More Info:
 - PMI-ACP® Handbook
 - PMI-ACP® Exam Content Outline
- Learn more at:
<https://www.pmi.org/certifications/types/agile-acp>

Reference: PMI, "PMI Agile Certified Practitioner (PMI-ACP)" Retrieved from:
<https://www.pmi.org/certifications/types/agile-acp>