

Quality Management and Continuous Improvement in Project Environments

PRINCIPLES OF QUALITY MANAGEMENT

Course Context

Project Management

PMP® Exam Prep

**Agile Transformation
for Leaders**

**Agile Transformation
for Team Members**

**Continuing Education +
Professional Development Units**



Course Objectives



Gain an understanding of quality-related terms and principles



Discover the value of a quality-focused mindset in project initiatives



Develop a quality management approach aligned with your project goals and methodology



Learn how data analysis and visualization facilitate quality management



Connect quality management and continuous improvement efforts



Principles of Quality Management

Developing a Quality Management Strategy





Continuous Improvement and Assessing Quality Challenges

Module Overview



Applying Project Principles to Quality Management



The Quality Mindset



Integrating Quality Management into Project Initiatives

Module Overview



Consequences of Poor Quality Management



Measuring and Analyzing Quality



Prioritizing Quality Management

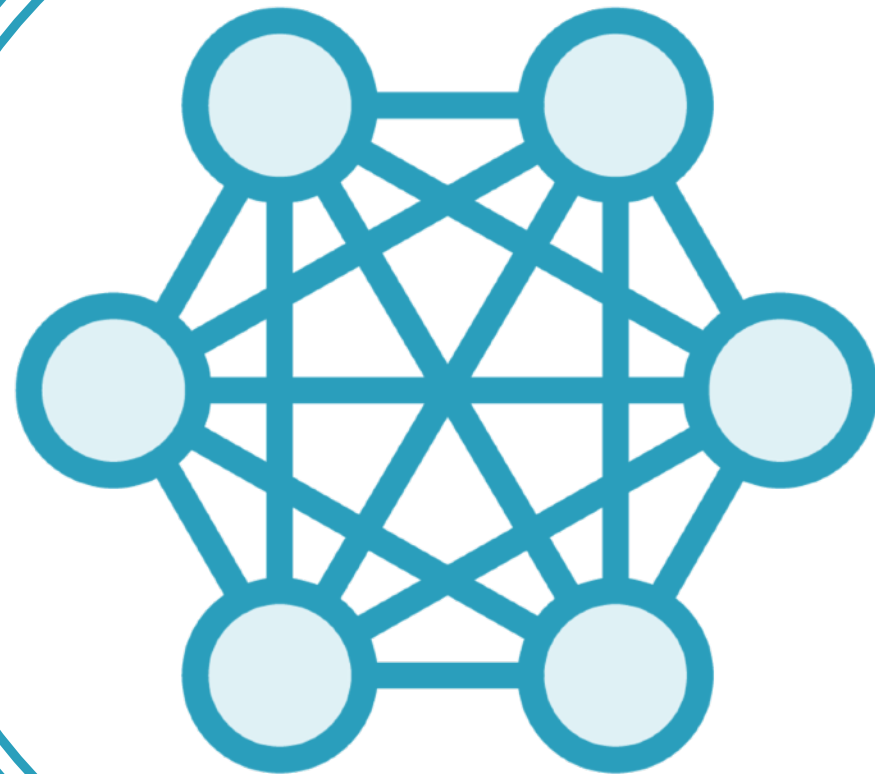
Applying Project Principles to Quality Management



Focus on Value

Quality and value are inherently tied

Underlying needs are best addressed when quality goals are achieved



Manage System Interactions

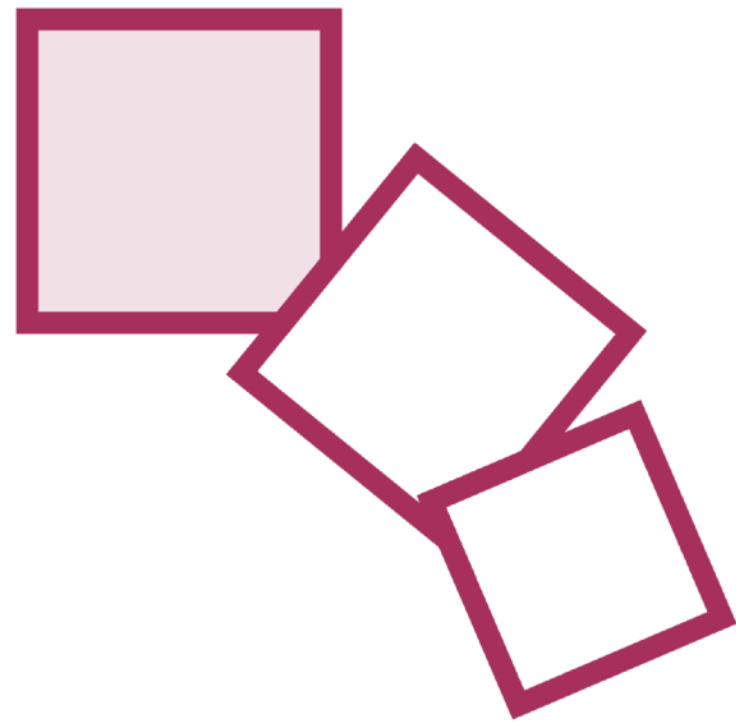
Considering the role of the project within the broader ecosystem, and the role of each action within the project, enhances quality outcomes



Recognize and Address Complexity

Selection of quality measurement methods becomes more difficult as complexity grows

Use of techniques like root cause analysis increases in value in complex environments



Enable and Facilitate Change

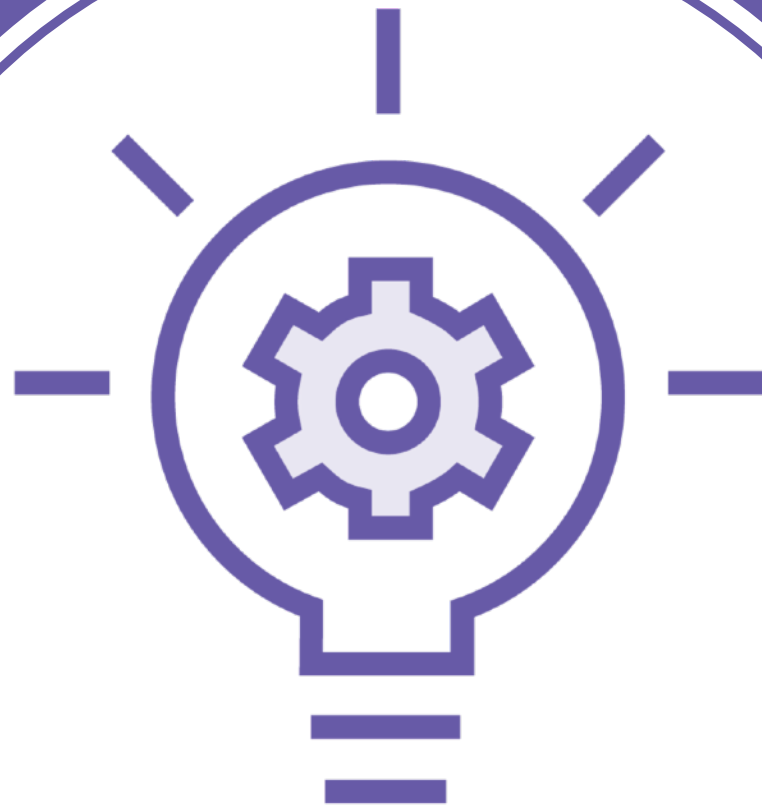
Quality outcomes are facilitators of change
Ensuring project work is handed over in a
high-quality manner enables transformation



Exhibit Adaptability and Resiliency

Quality metrics may need to adapt as project goals and work shift

High quality outcomes are definitionally more resilient



Address Opportunities and Threats

Poor quality outcomes increases threat of project failure or underperformance

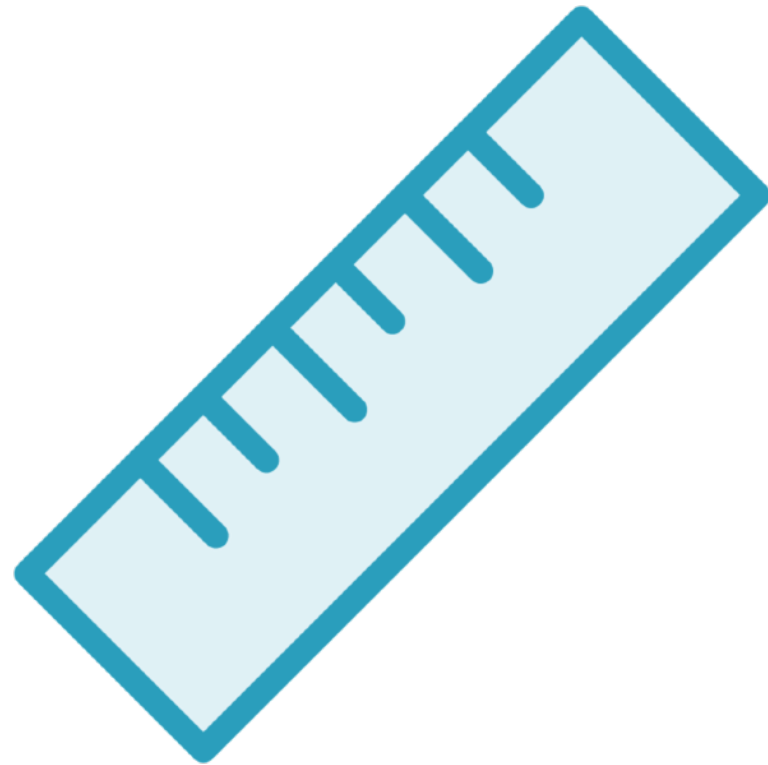
Risk tolerance is no excuse for inadequate quality management



Be a Good Steward

Quality results take into consideration the resources and effort expended in creation

Achieving the necessary quality to meet project goals is a matter of care and respect



Tailor Approach to Context

Quality metrics should be tailored to meet customer expectations and needs

While grade of product may vary, quality aspirations should always be high



Seek to Understand Stakeholders

Desired level of quality – and how quality is measured – is up to stakeholder perspective

Work should align to the quality standards and measurements that matter to stakeholders



Motivate and Coach Team Members

Commitment to quality must be exemplified by project leaders

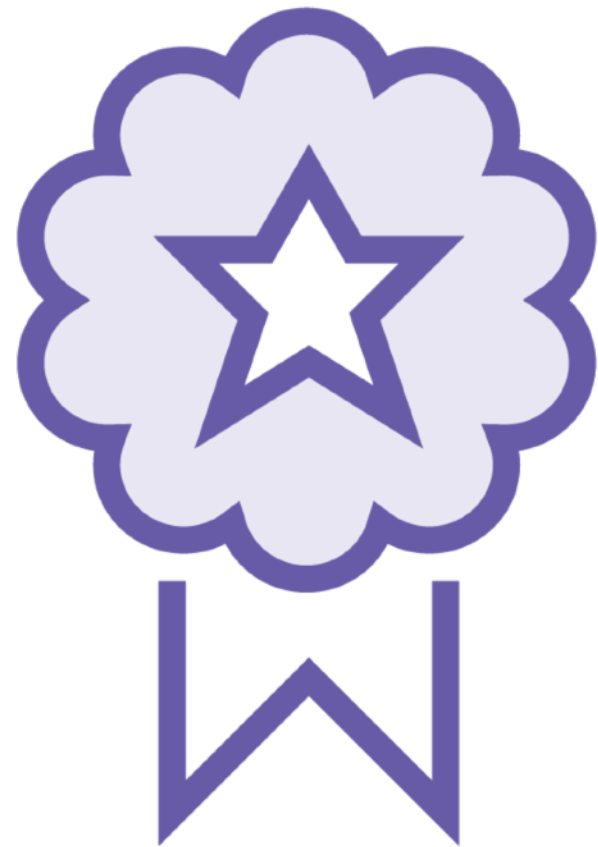
Coaching and development should help others understand the costs of subpar work



Foster Accountability and Respect

Meeting quality criteria is necessary in being held – and holding ourselves – accountable

Quality results earn respect and trust from clients, customers, and sponsors



Integrate Quality into Work

Quality should be top of mind throughout the project life cycle

The Quality Mindset

The Quality Mindset

Explicit and Defined

Implicit and Assumed

Related to Project Work Itself

Related to Output

.....



Expressed
Needs

.....

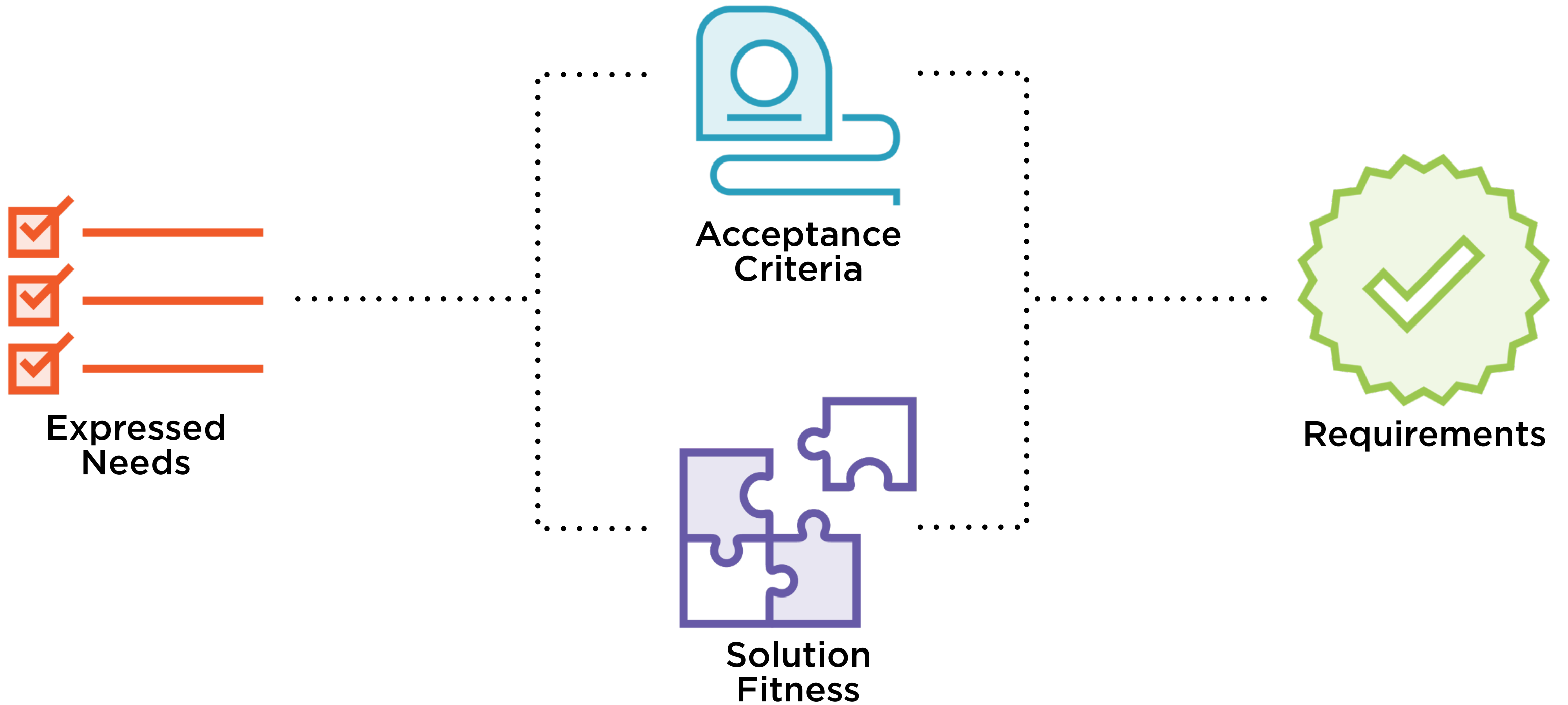
..... Contracts

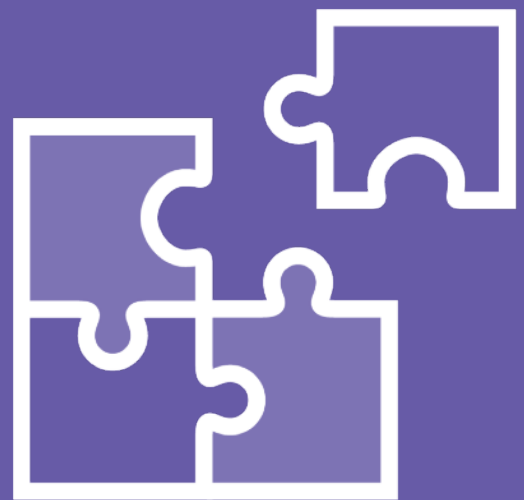
..... Stakeholders

..... Regulations

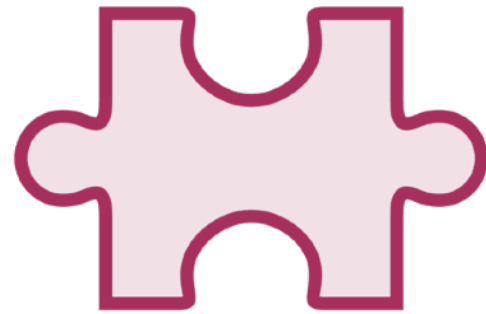
..... Policies

The Quality Mindset



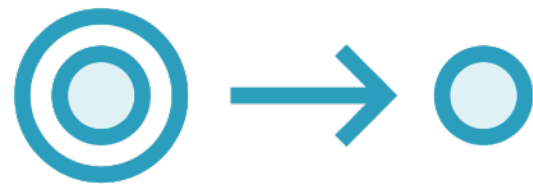


Solution Fitness



**Design
conformity:**

Meets criteria that may
impact integration



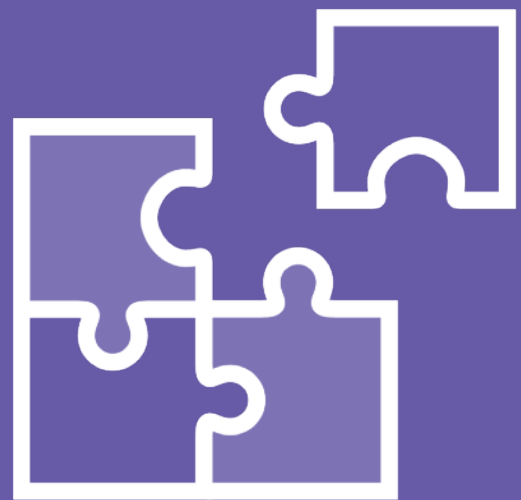
Efficiency:

Creates the desired result at
minimum expenditure



Performance:

Functions as intended
and envisioned



Solution Fitness



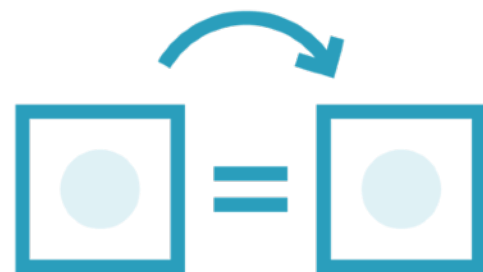
Reliability: Works without undue maintenance or downtime



Resiliency: Withstands unforeseen developments and failures; returns to service quickly following issues



Satisfaction: Is well-liked and well-adopted by intended users



Uniformity: Consistent in its output meeting requirements

Deliverables



Inspection &
Testing

Project Activities



Reviews

Deliverables



Inspection &
Testing

Project Activities



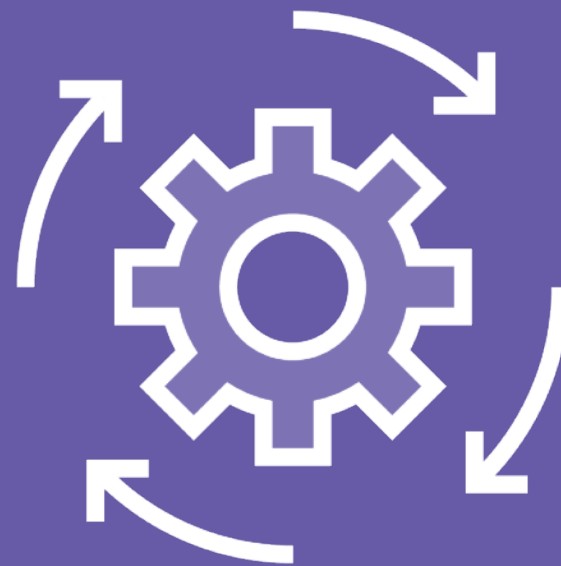
Reviews



Reviews



How quickly does project work begin offering value to the customer?



What processes empower us to minimize defects, rework, and wasted effort?

Quality management applies to project processes **and** results

Methods for managing quality are **unique** to each project

Integrating Quality Management into Project Initiatives

Quality Considerations

**Customer
Satisfaction**

**Management
Responsibility**

**Continuous
Improvement**

**Prevention Over
Inspection**

Cost of Quality

Quality Considerations



Customer Satisfaction

What does the customer expect?

What does the customer need?

What agreements have been made?

Requirements should be...

Understood	Evaluated
Defined	Managed

Quality Considerations

Management Responsibility

Define quality criteria and guidelines
prior to work taking place

Lead by example; uphold standards

Monitor quality of work and results

Coordinate necessary revisions to
quality management



Quality Considerations



Continuous Improvement

A cycle of plan-do-check-act can drive improvement efforts

Total quality management, six sigma, and other methodologies may also be useful to consider

Quality Considerations

Prevention Over Inspection

Plan, design, and build quality
into the entire project

Preventing mistakes is less costly
than correcting them later

Results in lower risk and
higher satisfaction



Quality Considerations



Cost of Quality

Includes all quality-related expenses:

- Preventing issues

- Assessing conformance

- Internal and external failure

- Rework of substandard results

Levels of Quality Management

Most effective

Foster Quality Culture

Incorporate Quality

Assure Quality

Detect and Correct

Customer-driven

Least effective

Take no active approach to quality management, leaving assessment to the customer

Leads to a variety of negative effects:

Warranty claims

Recalls

Rework

Diminished reputation

Levels of Quality Management

Most effective

Foster Quality Culture

Incorporate Quality

Assure Quality

Detect and Correct

Customer-driven

Least effective

Quality management takes place after initial work has been completed

Problems are identified before delivery to the customer

Better than nothing, but too reactive for most projects

Levels of Quality Management

Most effective

Foster Quality Culture

Incorporate Quality

Assure Quality

Detect and Correct

Customer-driven

Least effective

Apply quality management both to the result of work *and* to project processes themselves

Prevents teams from encountering the same issues repeatedly through greater proactivity

Levels of Quality Management

Most effective

Foster Quality Culture

Incorporate Quality

Assure Quality

Detect and Correct

Customer-driven

Least effective

Quality management is integrated into project planning and process development

Ensures a holistic approach to quality management within the project

Levels of Quality Management

Most effective

Foster Quality Culture

Incorporate Quality

Assure Quality

Detect and Correct

Customer-driven

Least effective

Ensures an understanding of the importance of quality management transcends the team

Results in greater buy-in and commitment from stakeholders and key executives

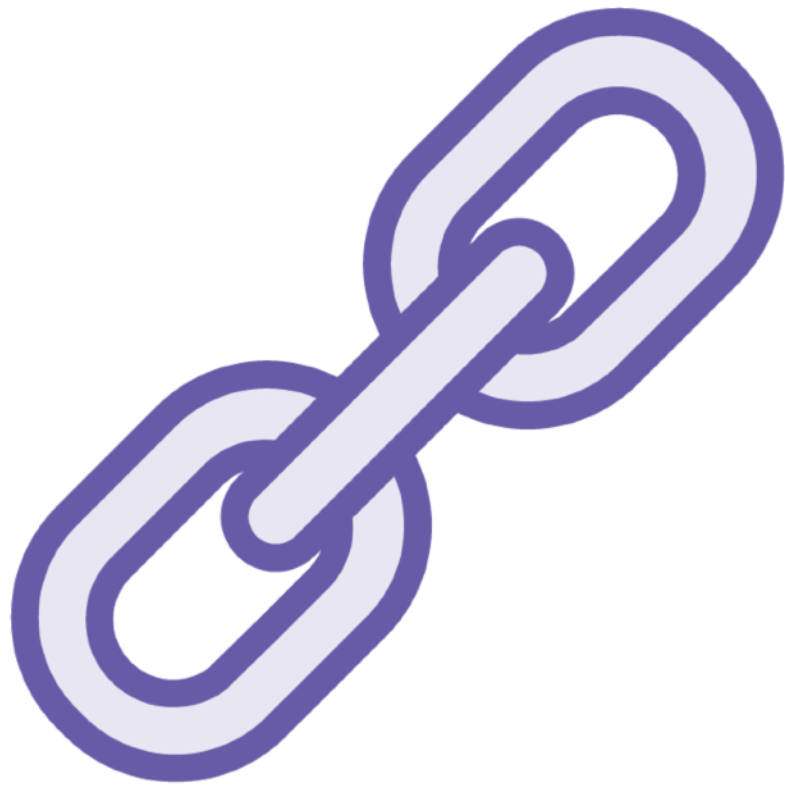
The Language of Quality Management



Costs of Conformance



Costs of Non-conformance



Costs of Conformance

Proactively focuses on reducing failure

Prevention costs are incurred ensuring creation of high-quality results

Appraisal costs are incurred searching for potential points of failure before delivery



Costs of Non-conformance

Non-conformance costs are incurred when repairs, rework, loss of functionality, and other suboptimal outcomes result from quality lapses

Internal failure costs are those incurred after discovery of flaws by the project team

External failure costs are those discovered by the customer after delivery

The Language of Quality Management

Quality

How well does the result fulfill its requirements?

Low quality: Poorly meets given requirements

High quality: Meets given requirements well

Low quality is ***always*** a problem

Grade

How sophisticated or refined is the result?

Low grade: Not very full-featured or sophisticated

High grade: Very full-featured and sophisticated

Low grade is ***not*** always a problem

High Quality / High Grade

Application with many features, extraordinary reliability and lack of bugs

High Quality / Low Grade

Application with few features but extraordinary reliability and lack of bugs

Low Quality / High Grade

Application with many features but poor reliability and many bugs

Low Quality / Low Grade

Application with few features, poor reliability and many bugs

High Quality / High Grade



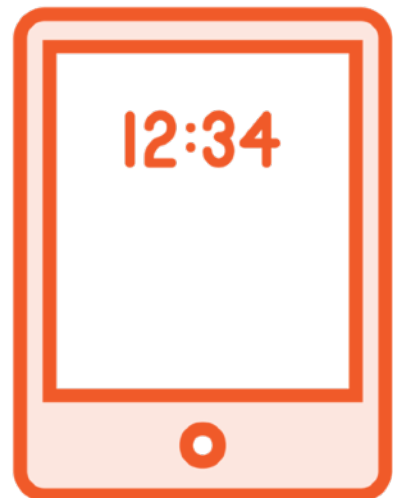
*Excellent
smartphone*

High Quality / Low Grade



*Reliable,
durable pen*

Low Quality / High Grade



*Cheaply made
tablet*

Low Quality / Low Grade



Brittle pencil

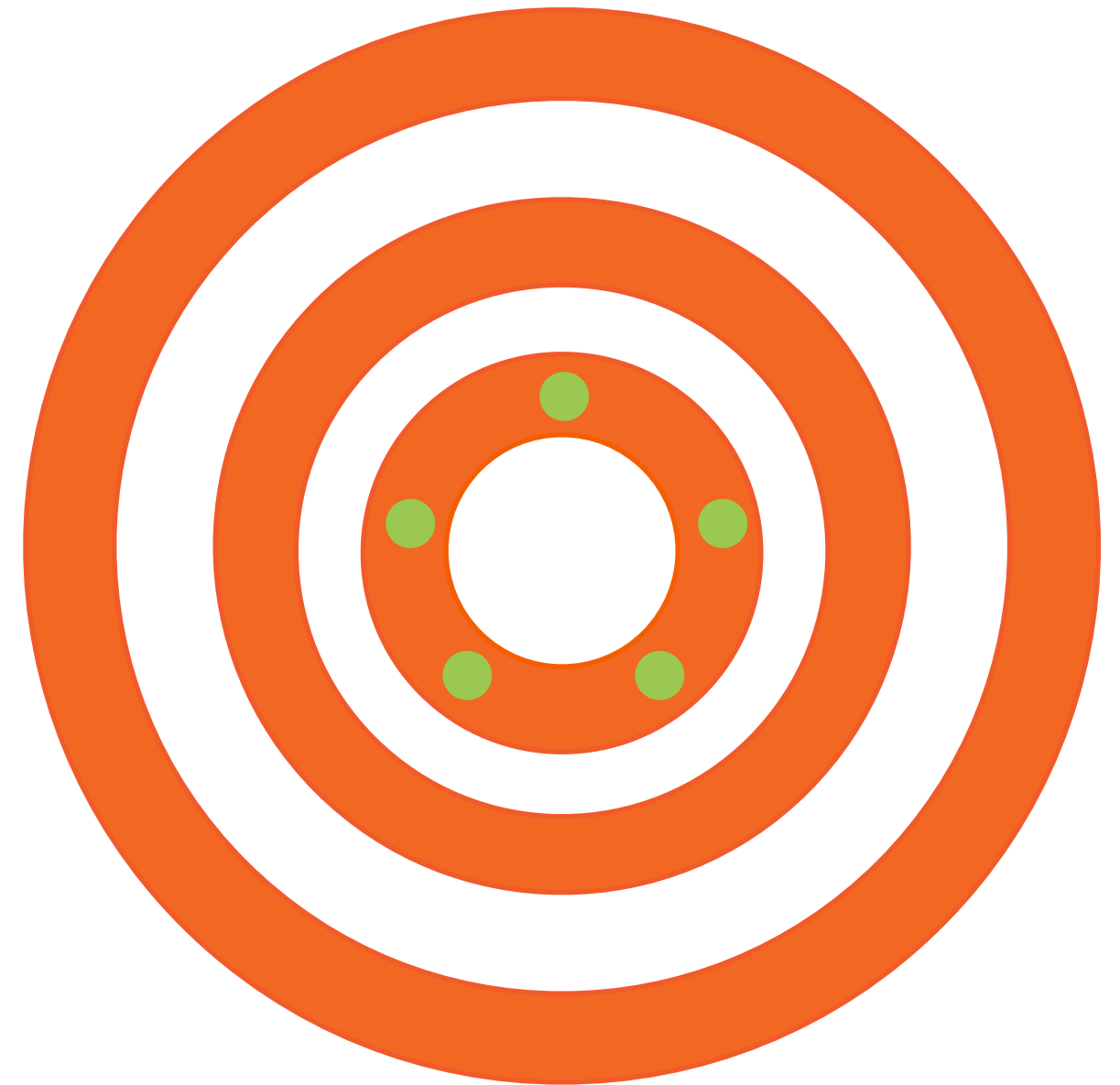
Precision

How **exact** are the results?



Accuracy

How **correct** are the results?



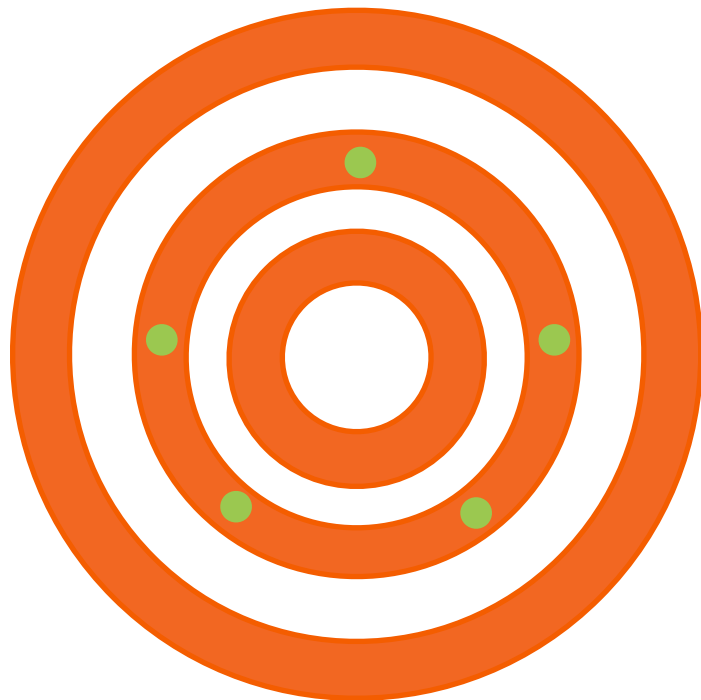
High Precision / High Accuracy



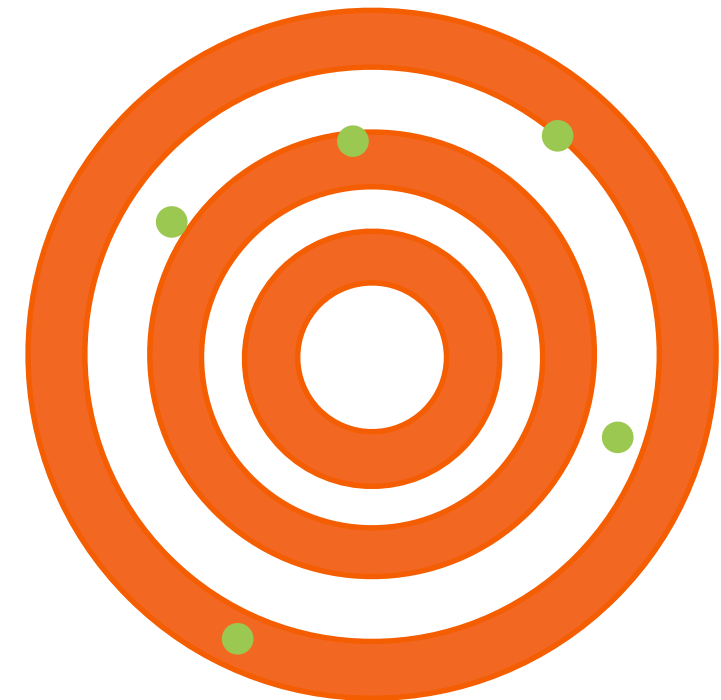
High Precision / Low Accuracy



Low Precision / High Accuracy



Low Precision / Low Accuracy





Precision and
Accuracy

Different projects may call for higher or lower **grades**, but always require high **quality**

Accurate results may be required when **precise** results not required

More rarely, highly **precise** but less **accurate** results may suffice

Measuring and Analyzing Quality



Measuring and Analyzing Quality

Quality metrics are designed in advance of work to measure performance and outcomes

Metrics focus on project or product attributes that align with goals



**Measuring and
Analyzing Quality**

Quality assurance ensures work meets goals while in production

Quality control ensures output meets goals after production is complete

Metrics are used for QA and QC purposes



Measuring and Analyzing Quality

- Percent of tasks completed when expected
- Cost performance of project activities
- Failure rate of project-developed components
- Number of defects discovered during or after delivery of a component
- Customer satisfaction with delivered components

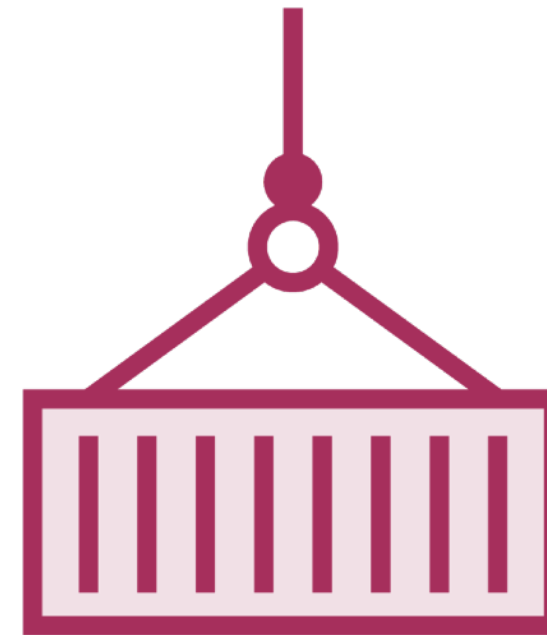
Sources of Quality Data



Checklists



Sensors



Output



Feedback



Checklists

.....
Standardized checklists help in both quality assurance and quality control

.....
Organization or industry groups may have checklists available for a variety of tasks

.....
Checklists created by the project team may later prove useful in delivery to customer

.....
Critical checklists be universally updated if procedures are changed

.....
“Do and check” method is less desirable than “Check then do”



Analyzing Documents

Quality information is typically collected in a variety of reports

Setting criteria in advance makes analysis much simpler to undertake objectively

Ensure reports are associated with the context necessary for understanding

Prioritizing Quality Management



Cost

Benefit



Cost

Benefit

Cost-benefit Analysis

Useful in determining the scope of quality management efforts

Essential to assessing alternative courses of action in meeting objectives

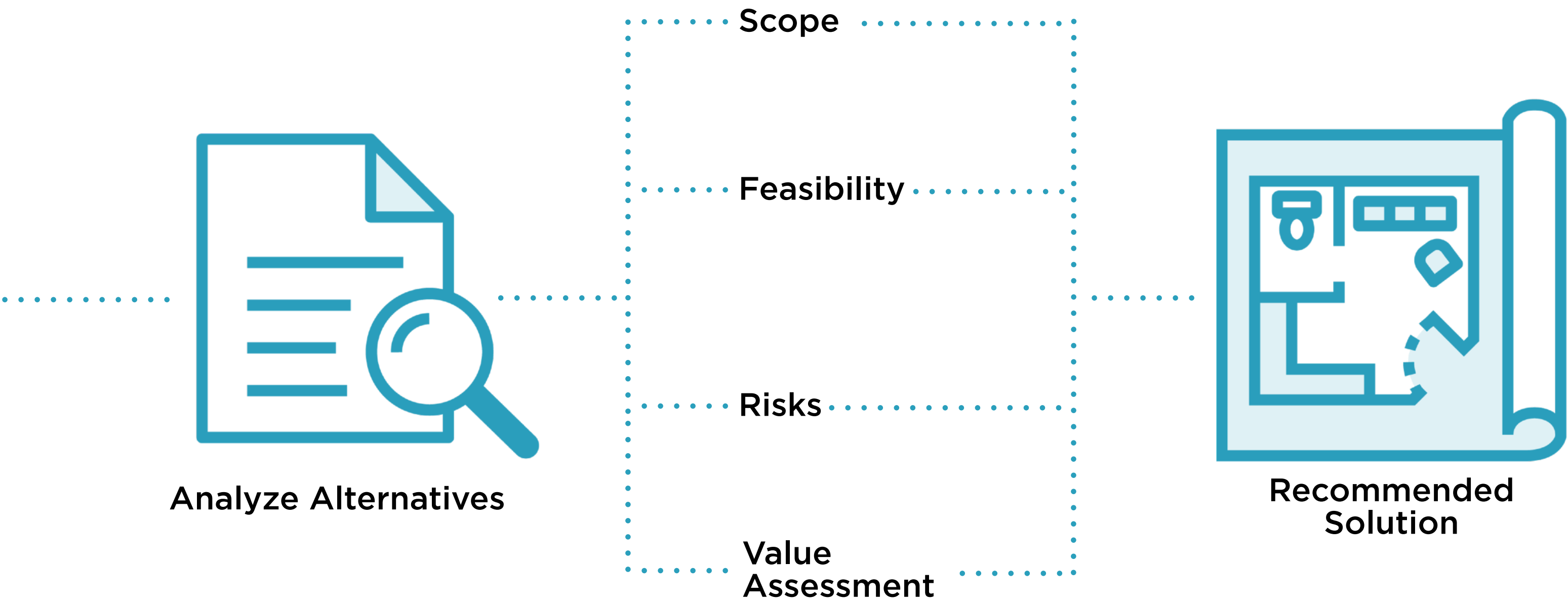
Costs of quality include those related to prevention, appraisal, and failure

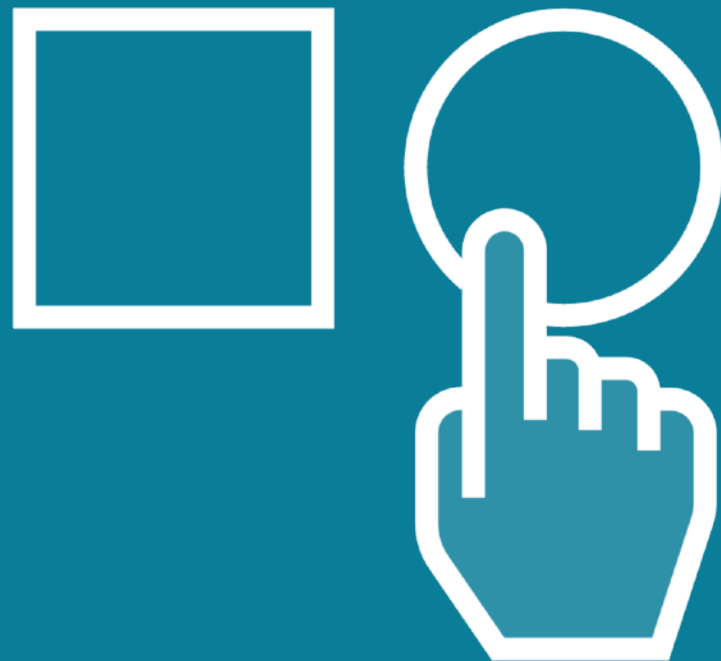


Needs Assessment



Desired
Outcomes



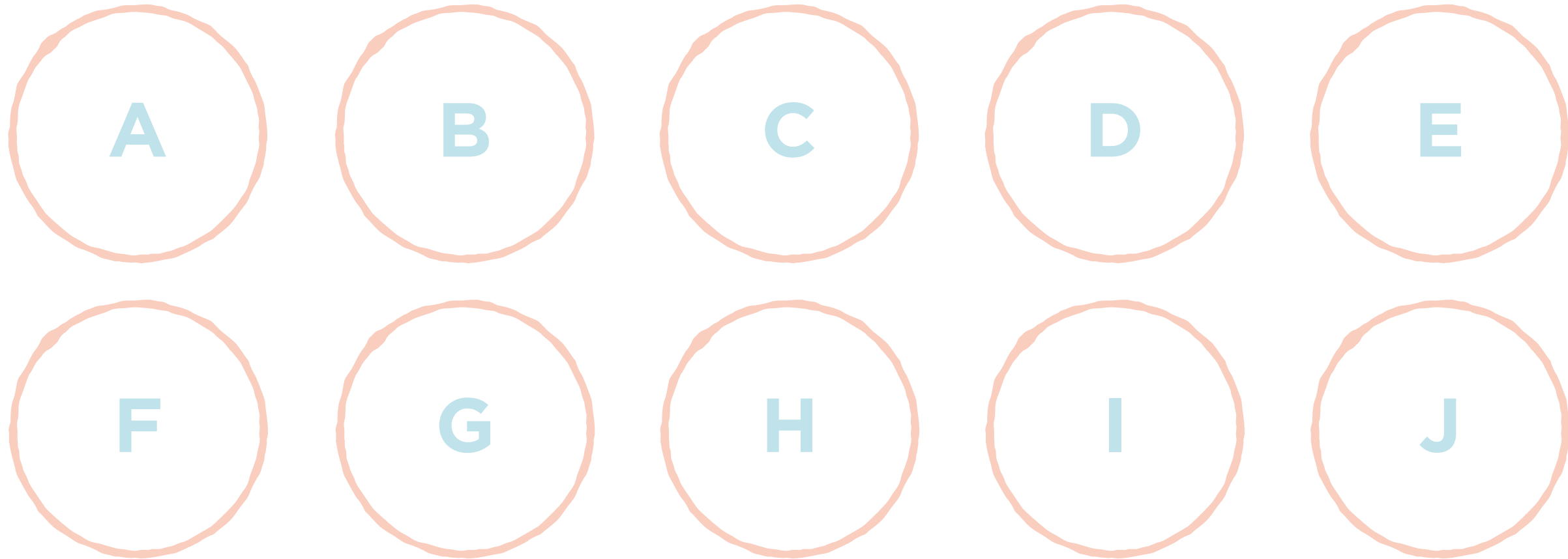


Alternatives Analysis

Weighted matrices can be useful in determining quality priorities and methods

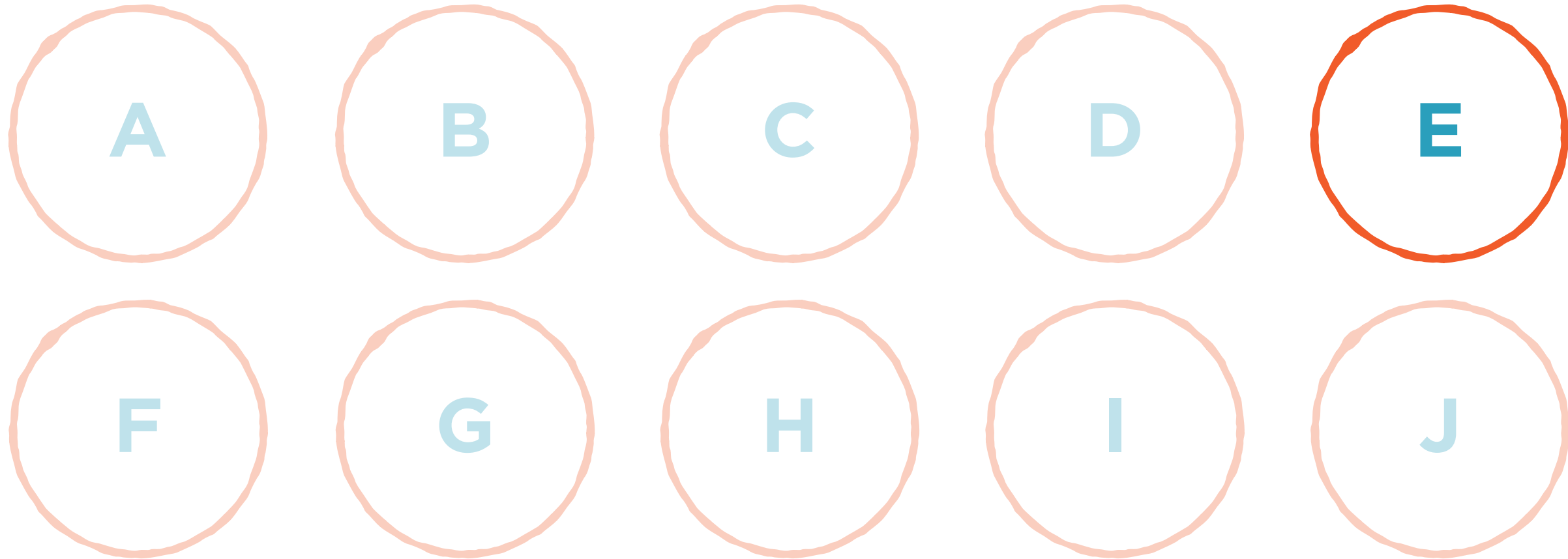
Decisions may involve the way the *project* work is conducted or the *product* that the project team is creating

Assessing Alternative Options



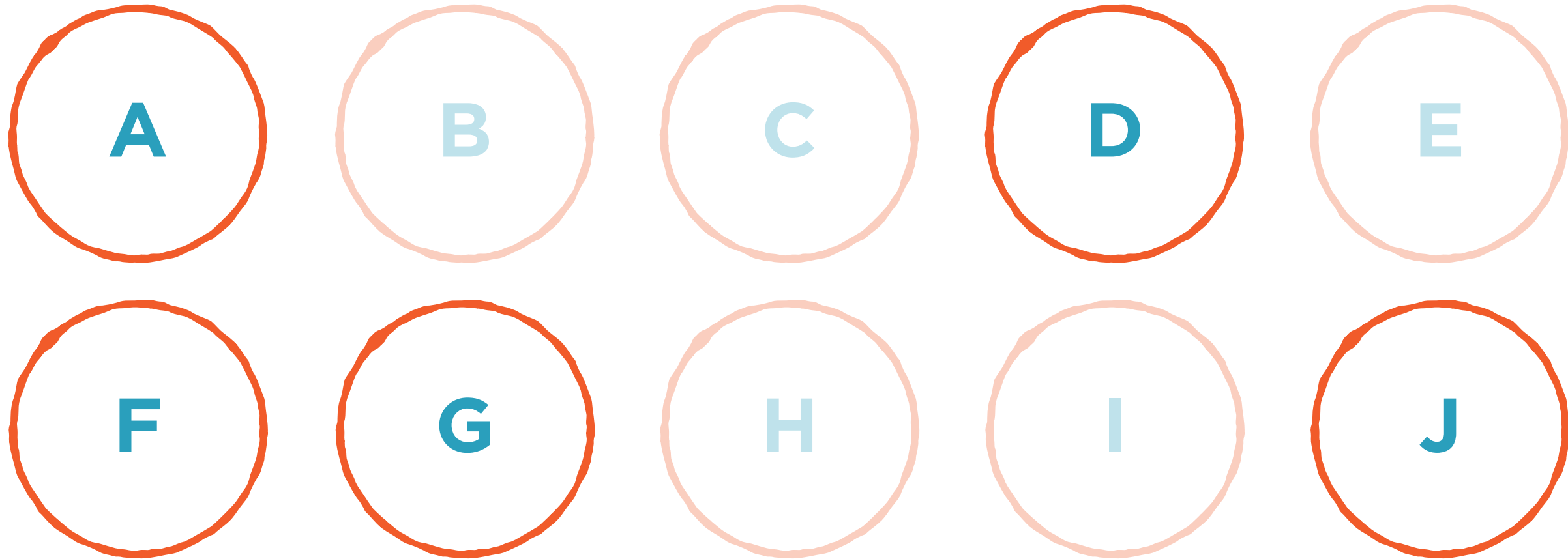
**No options considered feasible.
Recommend not taking any action?**

Assessing Alternative Options

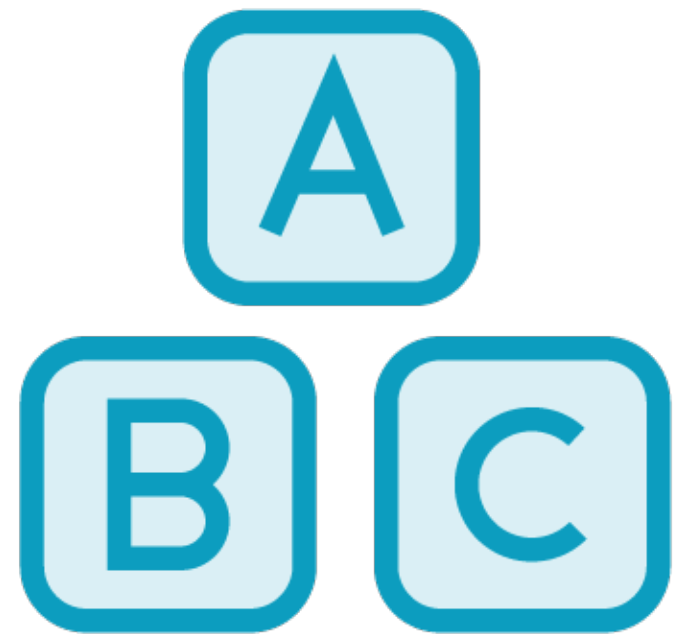


**One option considered feasible.
Likely recommend this option.**

Assessing Alternative Options



**Several options remain feasible.
Conduct a weighted ranking.**

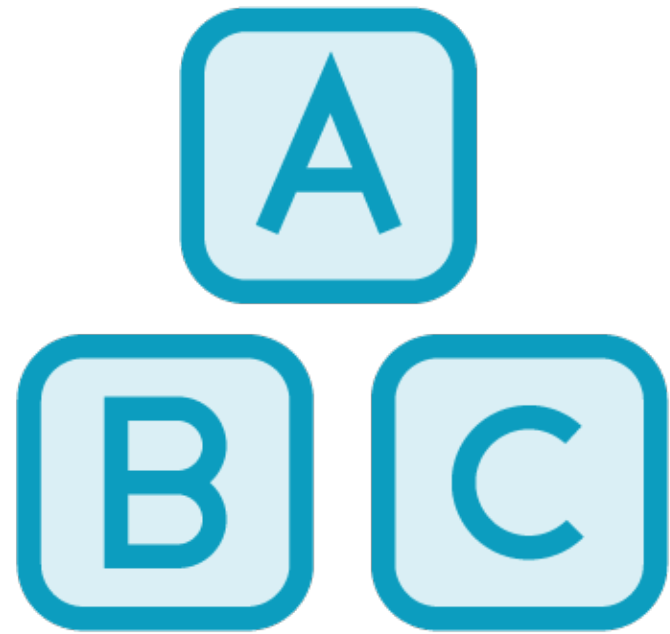


Weighted Ranking

Assigns a percentage weighting to each of several factors

Criteria and weightings will differ based on situation and organizational priorities

Criteria and weightings should be in line with relevant goals and objectives



Weighted Ranking

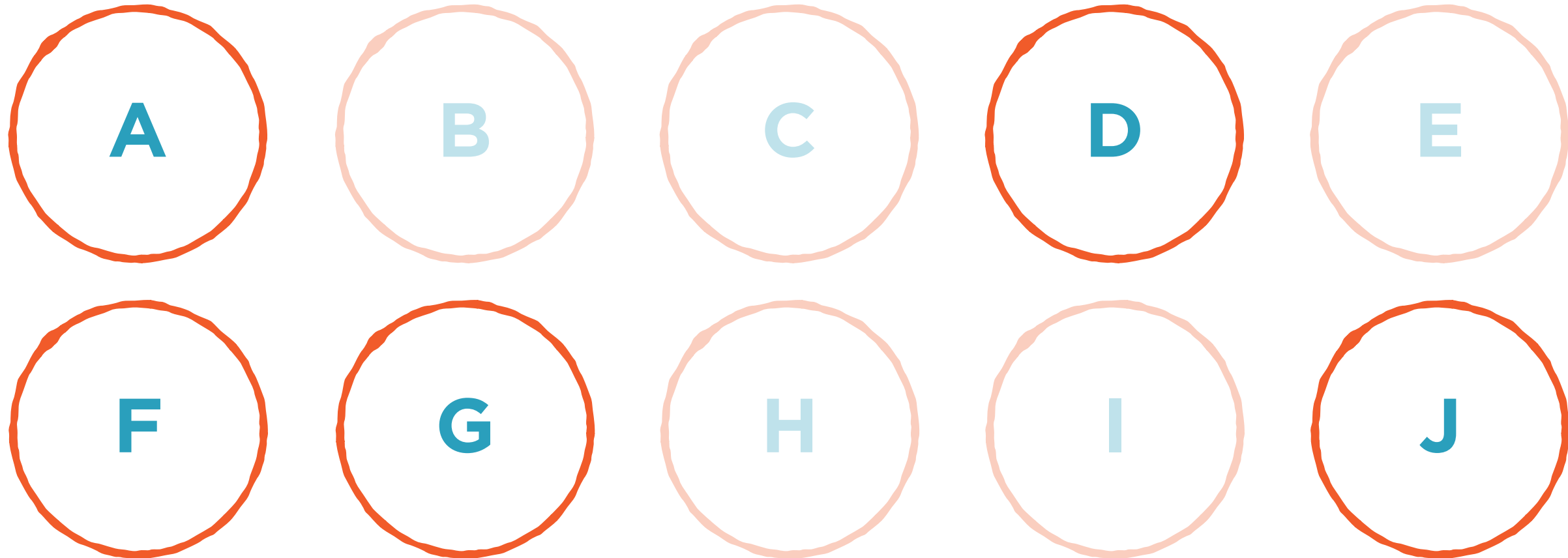
Pair-matching allows each option to be compared to every other option

Consensus of key stakeholders should be built around weighting and ranking processes

Weighted-Ranking Matrix

	Cost- Effectiveness 35% Weight	Technical Feasibility 40% Weight	Operational Feasibility 25% Weight	Total Score	Final Rank
Solution A	(3*.35) = 1.05	(5*.40) = 2.00	(3*.25) = 1.05	4.10	1
Solution D	(5*.35) = 1.75	(2*.40) = 0.80	(5*.25) = 1.05	3.60	2
Solution F	(1*.35) = 0.35	(3*.40) = 1.20	(2*.25) = 1.05	2.60	5
Solution G	(2*.35) = 0.70	(4*.40) = 1.60	(1*.25) = 1.05	3.35	3
Solution J	(4*.35) = 1.40	(1*.40) = 0.40	(3*.25) = 1.05	2.85	4

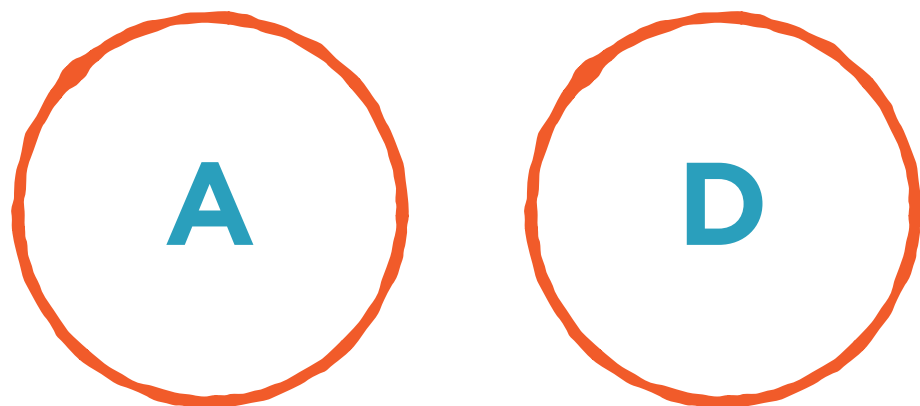
Pair-Matching: Cost-Effectiveness



Pair-Matching: Cost-Effectiveness



Pair-Matching: Cost-Effectiveness



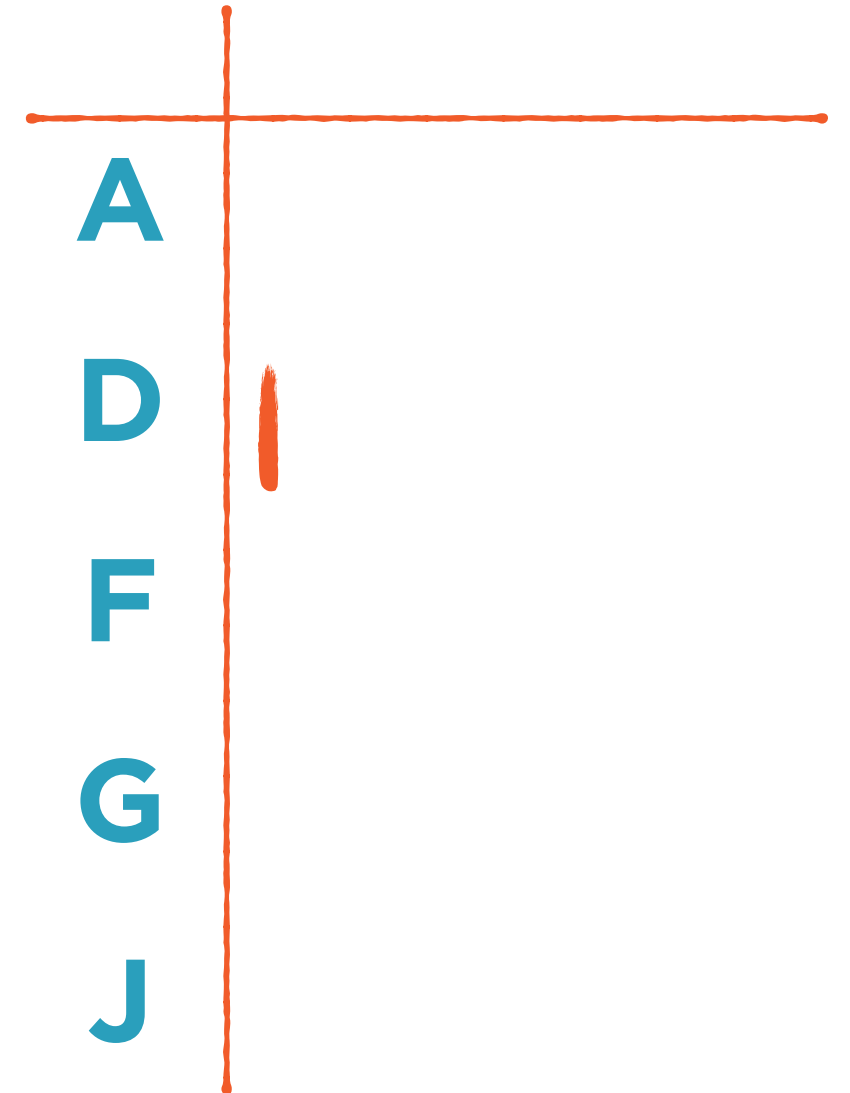
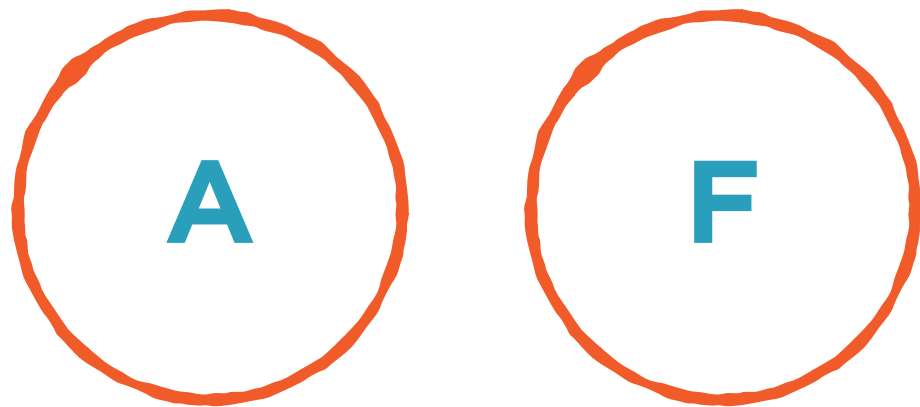
Pair-Matching: Cost-Effectiveness

D

A

A	
D	I
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Pair-Matching: Cost-Effectiveness



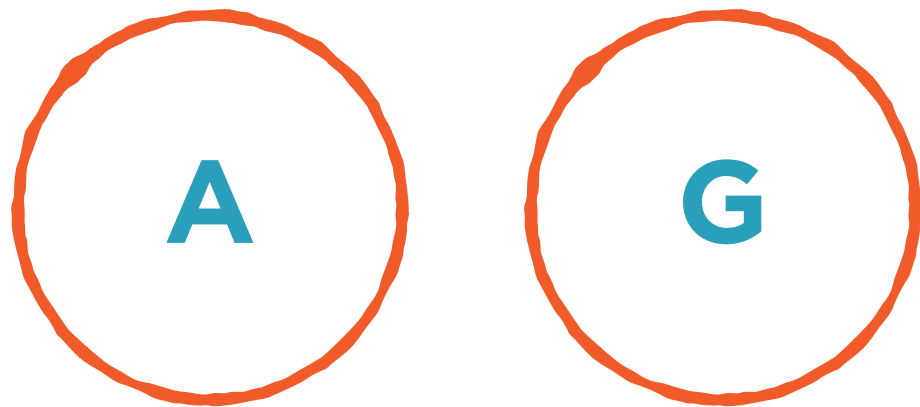
Pair-Matching: Cost-Effectiveness

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Pair-Matching: Cost-Effectiveness



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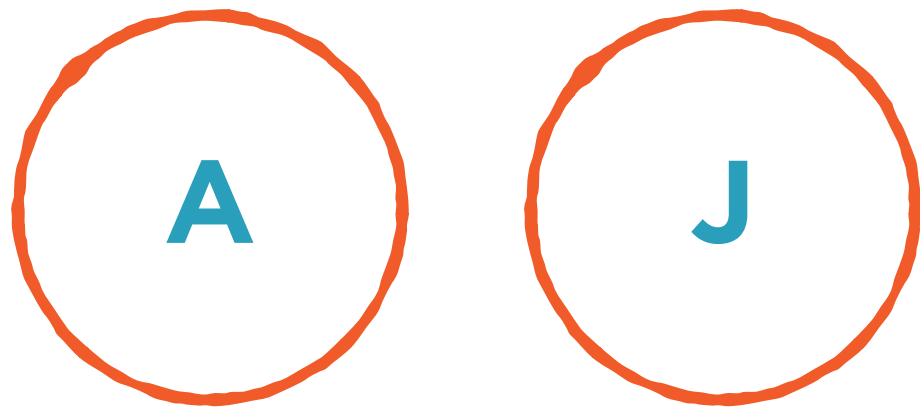
Pair-Matching: Cost-Effectiveness

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Pair-Matching: Cost-Effectiveness



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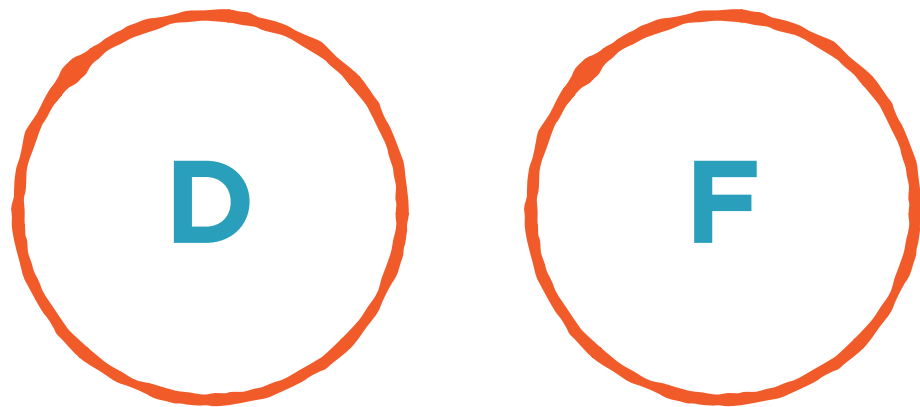
Pair-Matching: Cost-Effectiveness

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Pair-Matching: Cost-Effectiveness



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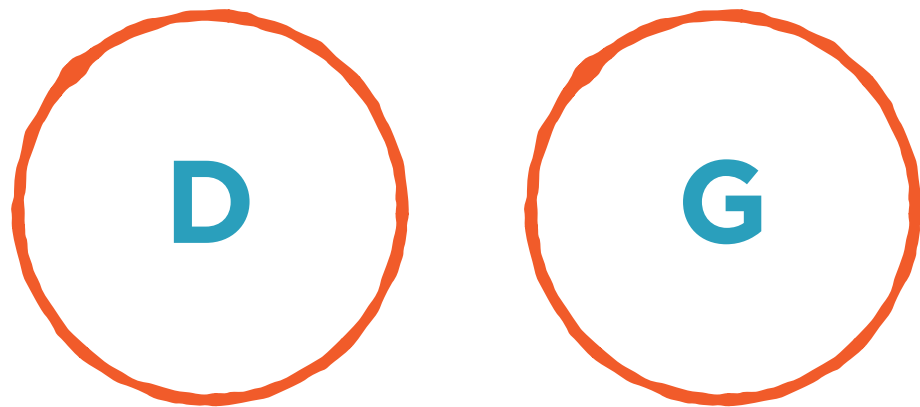
Pair-Matching: Cost-Effectiveness

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Pair-Matching: Cost-Effectiveness



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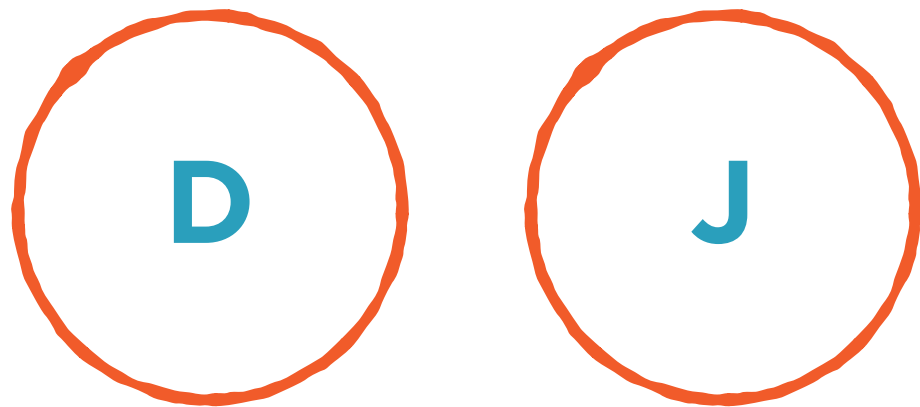
Pair-Matching: Cost-Effectiveness

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Pair-Matching: Cost-Effectiveness



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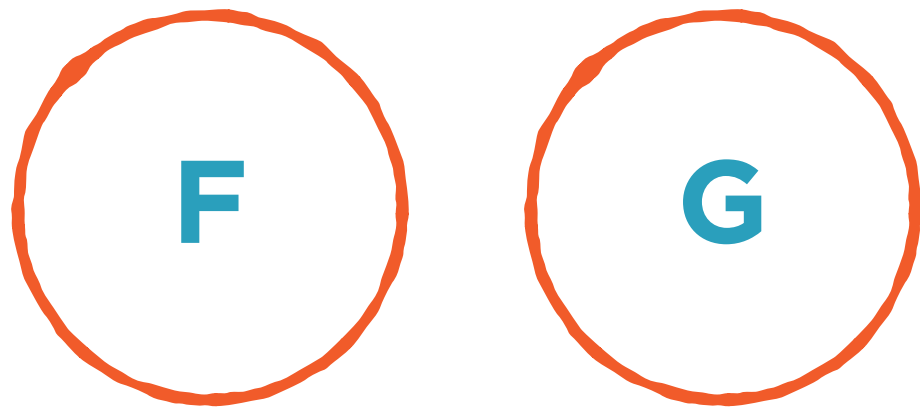
Pair-Matching: Cost-Effectiveness

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Pair-Matching: Cost-Effectiveness



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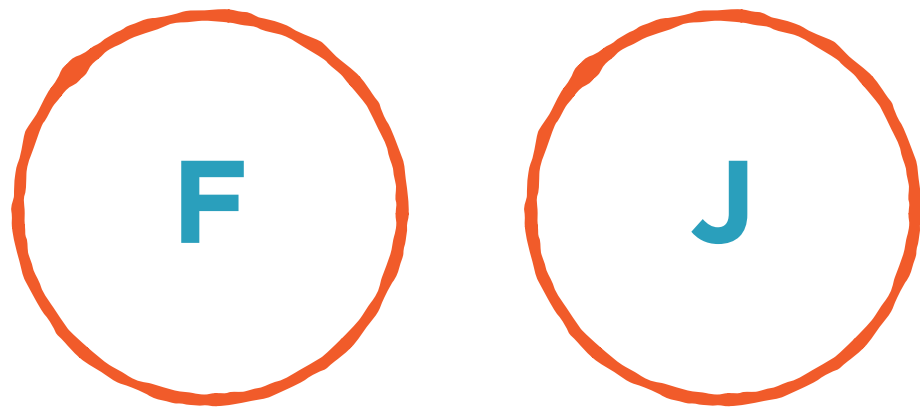
Pair-Matching: Cost-Effectiveness

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Pair-Matching: Cost-Effectiveness



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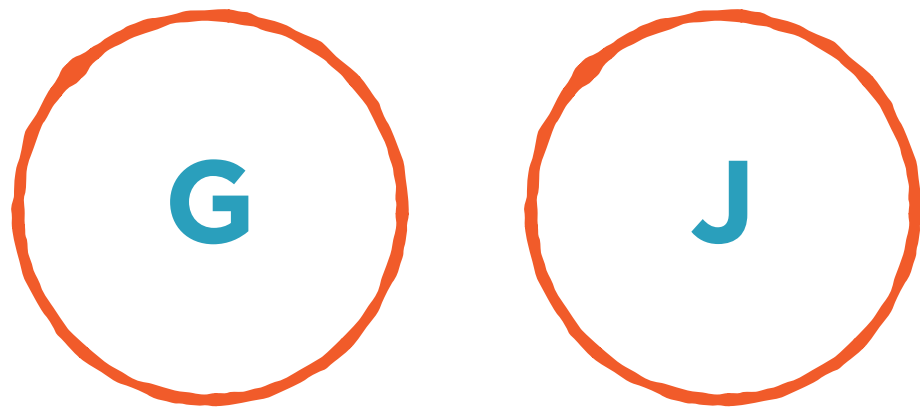
Pair-Matching: Cost-Effectiveness

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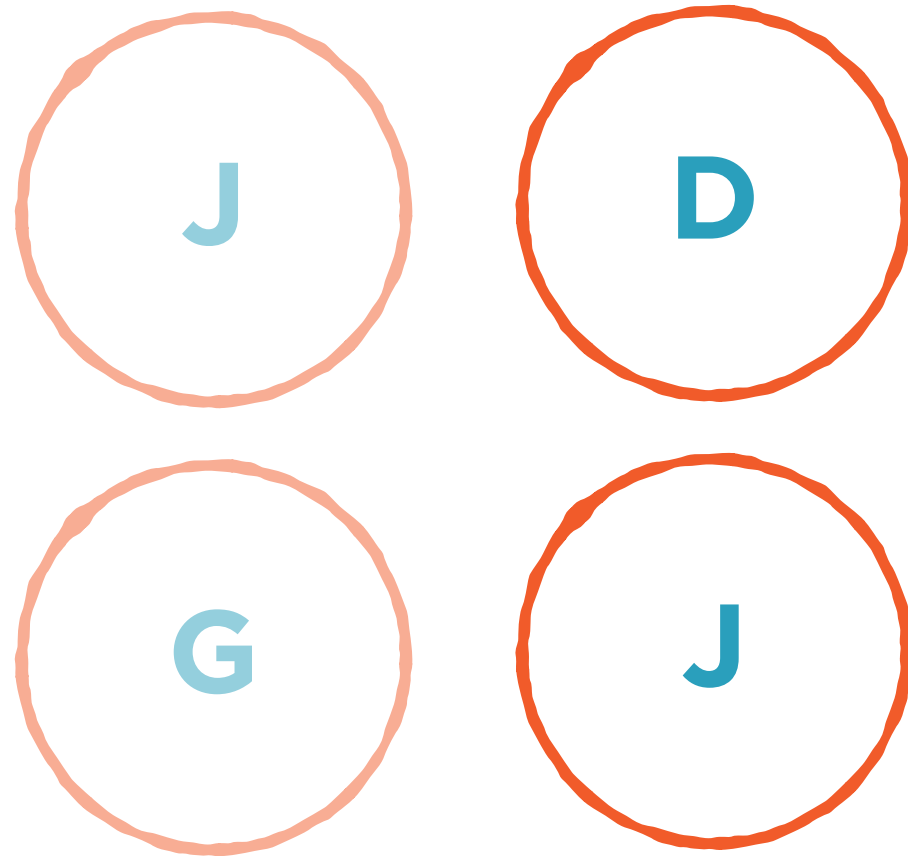
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Pair-Matching: Cost-Effectiveness



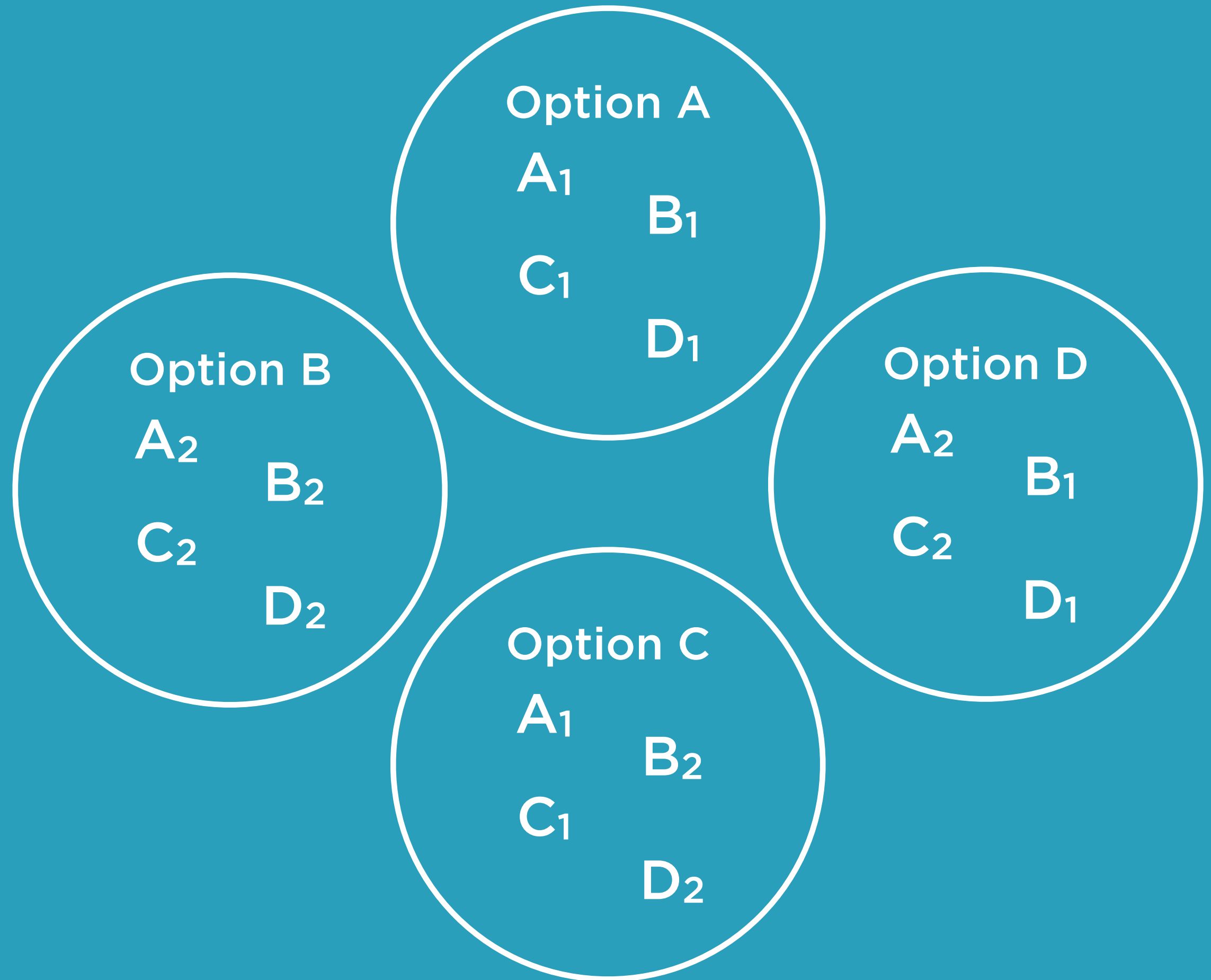
A	
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Pair-Matching: Cost-Effectiveness

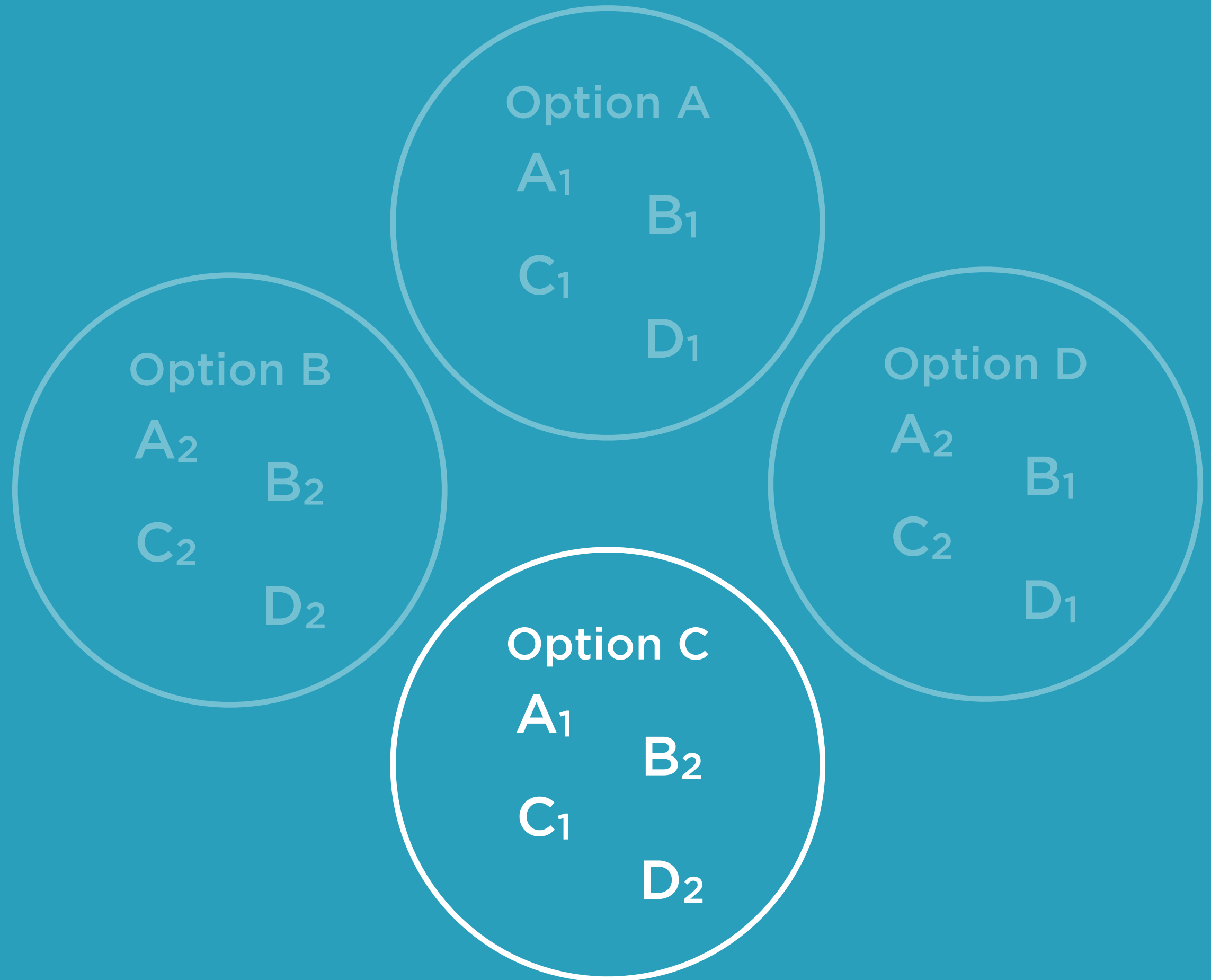


<u>Score</u>	<u>Rank</u>	
3	3	A
5	1	D
1	5	F
2	4	G
4	2	J

Selecting from Sets of Possibilities



Selecting from Sets of Possibilities





Takeaways

Quality management ensures requirements are met in a satisfactory manner

Solution fitness is assessed to ensure work completed actually fulfills stakeholder needs



Takeaways

Quality management applies to both the project work itself and to the results the project creates

Customer-driven quality is the least effective and often most expensive

Fostering quality-centric culture and incorporating quality into core design processes ensures the best outcomes



Takeaways

Costs of conformance focus on reducing and preventing failure

Costs of non-conformance relate to quality failures that must be addressed

High-quality outcomes are always desirable, while high-grade outcomes are not always necessary

Precision and accuracy aren't the same



Takeaways

Quality may be managed through a combination of checklists, performance data and feedback

Changes to quality approaches are part of holistic continuous improvement

Weighted-ranking systems can help in prioritizing quality-related efforts