PROJECT MANAGEMENT FUNDAMENTALS BOOTCAMP

Session 3

Class will begin at 11am EDT

Instructor: Barb Waters, MBA, PMP

QUALITY ASSURANCE

Audit

- Structured, independent review
- Determine if activities comply with policies, processes and procedures
- Identify inefficiencies
- Can be scheduled or random
- Internal or external

THE QUALITY RELATIONSHIP

Identifying and following the correct processes in QA leads to acceptable deliverables in QC.

Quality Assurance: Procedures

- Store food properly
- Wash hands
- Follow food preparation processes
- Assemble plates efficiently
- Wash and sanitize dishes

Quality Control: Deliverables

- ✓ Food Quality
- ✓ Health Standards
- ✓ Consistency of menu items
- ✓ Speed of service
- ✓ Clean plates and tableware

THE QUALITY RELATIONSHIP

Problems can be found through Prevention (conformance) activities such as inspections, or through Failure (non-conformance) when the customer is dissatisfied.

Quality Assurance: Procedures

- Store food properly
- Wash hands
- Follow food preparation processes
- Assemble plates efficiently
- Wash and sanitize dishes

Quality Control: Deliverables

- ✔ Food Quality
- ✔ Health Standards
- ✔ Consistency of menu items
- ✔ Speed of service
- ✘ Clean plates and tableware

FISHBONE OR ISHIKAWA DIAGRAM

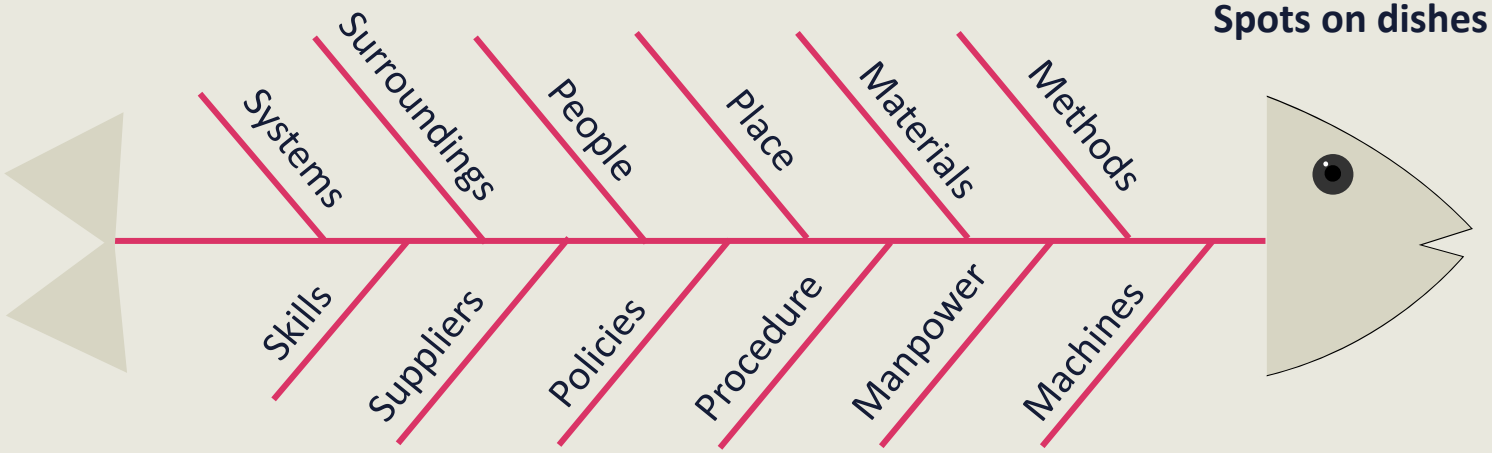
Why are there spots on the dishes?

- Is it an equipment issue?
- Is it a training issue?
- Is it something else?

Ishikawa Diagram

Fishbone Diagram

Cause and Effect Diagram



Identify the Issue → correct it or Submit Change Request → Validate Change

THE QUALITY RELATIONSHIP

Problems can be found through Prevention (conformance) activities such as inspections, or through Failure (non-conformance) when the customer is dissatisfied.

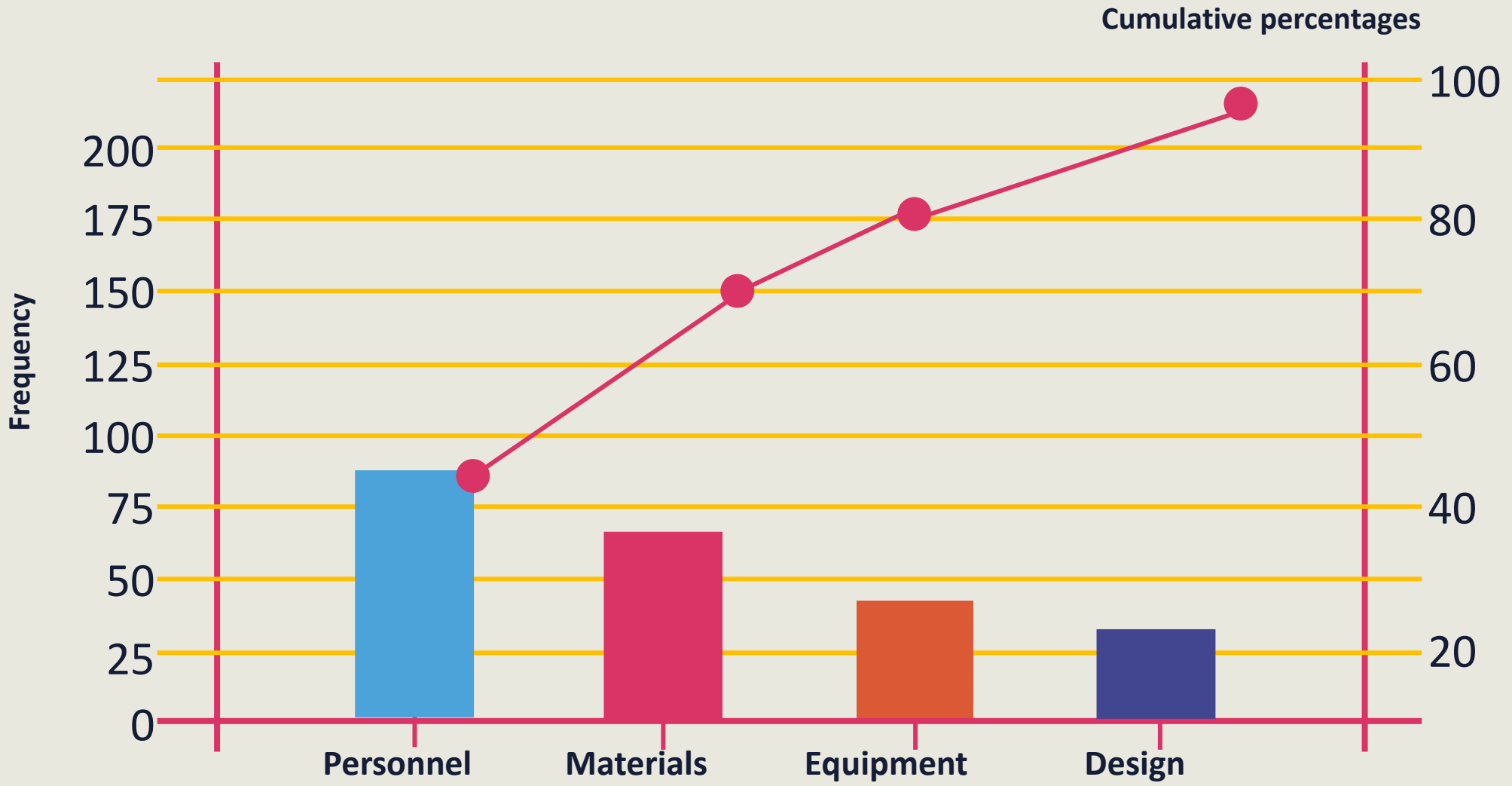
Quality Assurance: Procedures

- Store food properly
- Wash hands
- Follow food preparation processes
- Assemble plates efficiently
- Wash and sanitize dishes

Quality Control: Deliverables

- ✗ Food Quality
- ✗ Health Standards
- ✗ Consistency of menu items
- ✗ Speed of service
- ✗ Clean plates and tableware

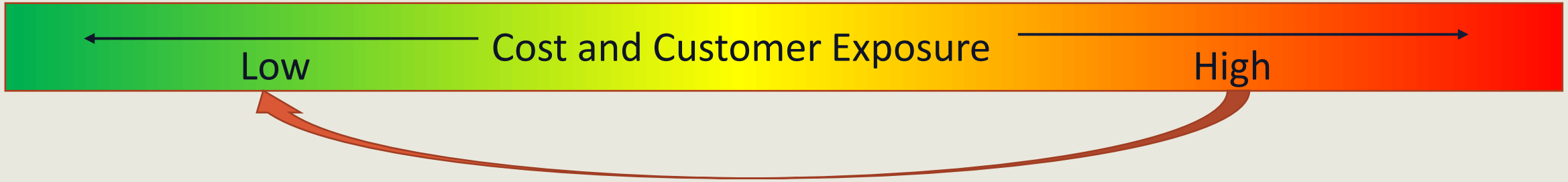
PARETO DIAGRAM (80/20 RULE)



COST OF QUALITY AND PROCESS IMPROVEMENT

Conformance		Nonconformance	
Prevention	Appraisal	Internal Failure	External Failure
Training	Testing	Scrap	Warranty
Documenting processes	Destructive testing	Rework	Liability
Maintaining equipment	Inspecting		Lost business
Don't skip steps			Loss of reputation

Use continuous improvement to increase efficiency, eliminate or reduce waste, and make incremental improvements.



QUALITY AND PROCESS IMPROVEMENT

Total Quality Management

- Continuous incremental improvements
- All team members participate
- Increase efficiency
- Eliminate or reduce waste
- Process improvement is iterative

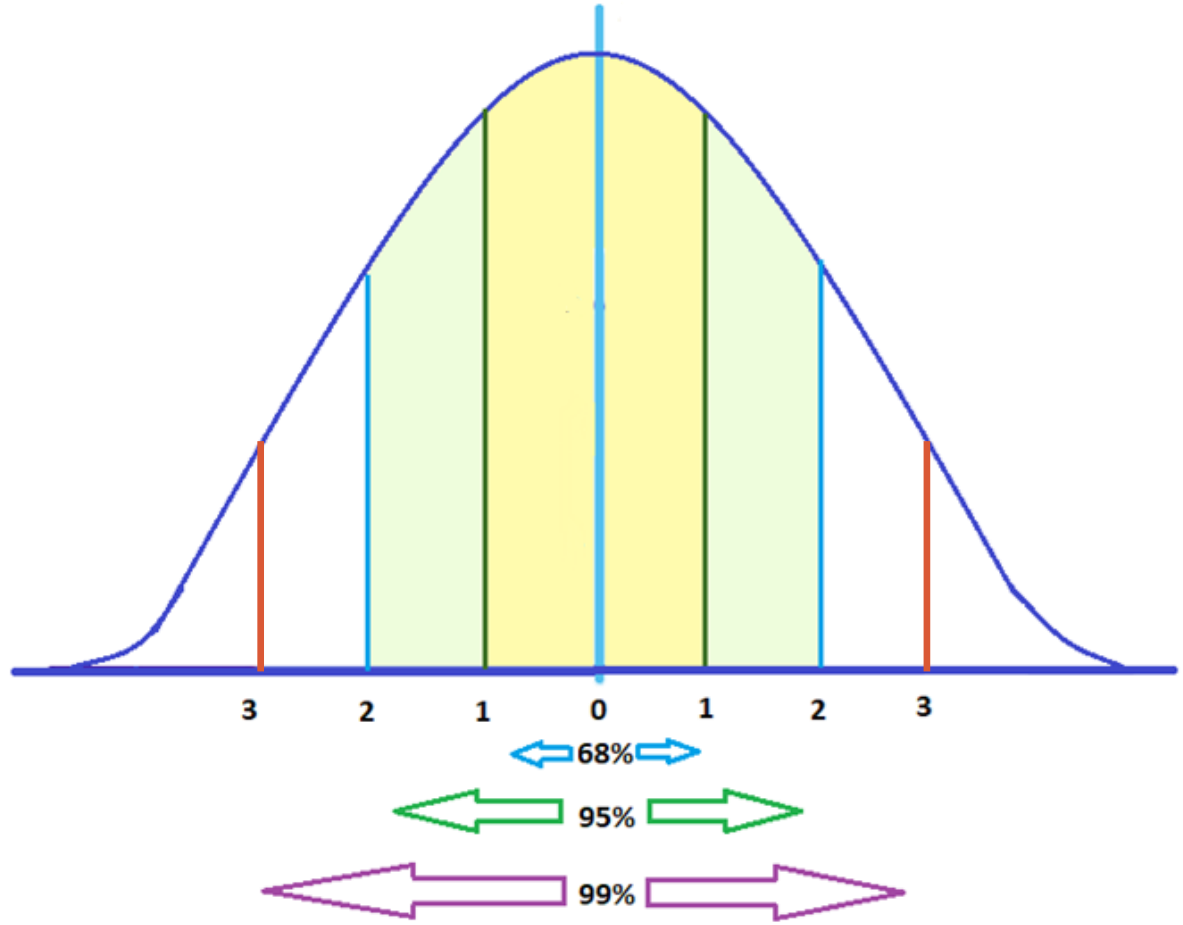
Quality: "*The degree to which a set of inherent characteristics fulfill requirements*"

HISTOGRAM

- Normal distribution
- “Bell curve”
- Special cause
- Common cause

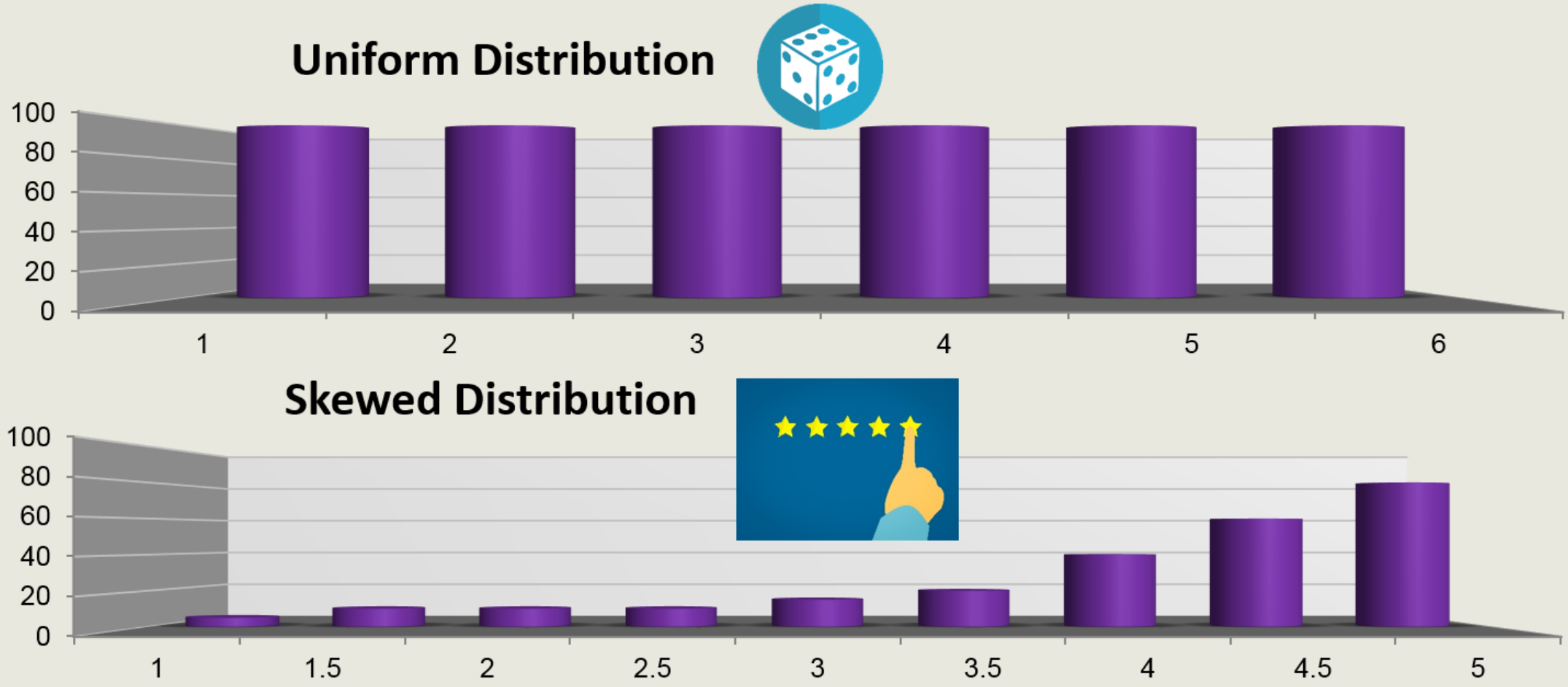
Empirical Rule

- 68.2% of the samples will be within 1 standard deviation of the mean
- 95.4% of the samples will be within 2 standard deviations of the mean
- 99.7% of the samples will be within 3 standard deviations of the mean



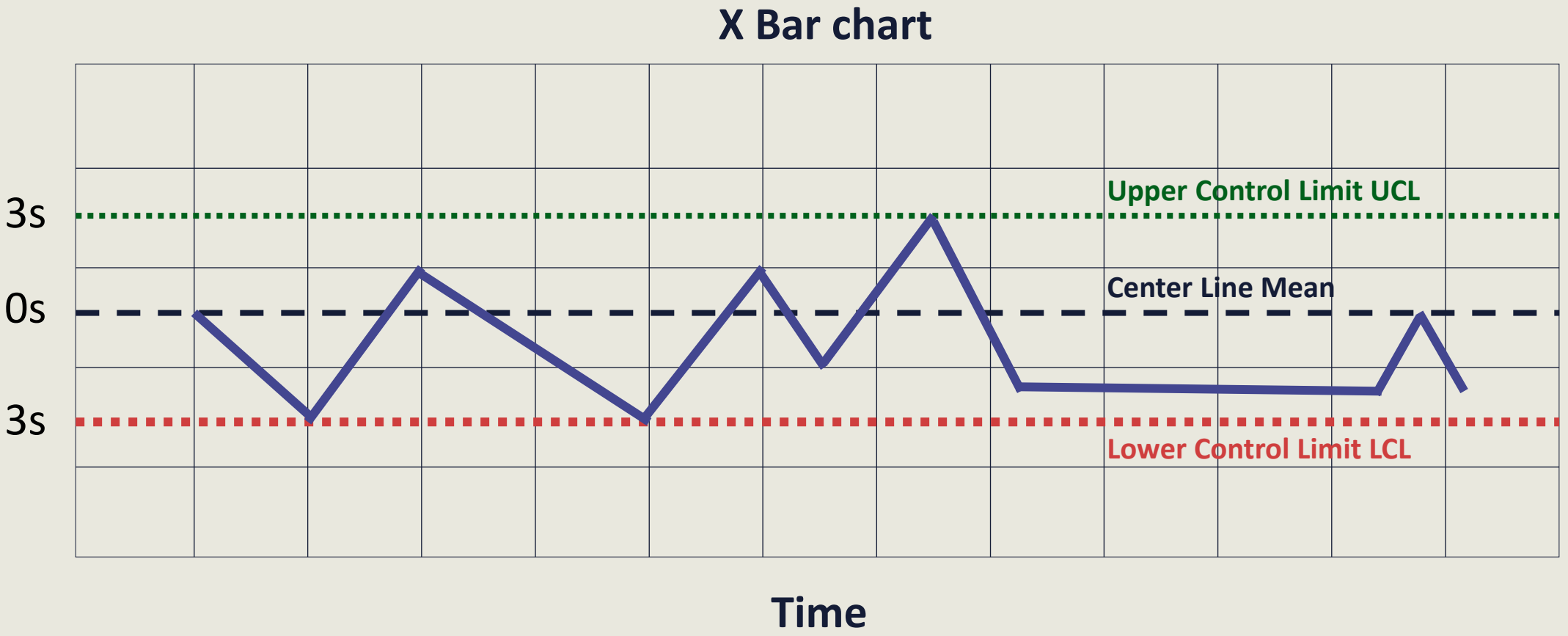
Six Sigma = 6σ
99.9997% of samples within 6 standard deviations of the mean
3.4 defects per million

HISTOGRAM



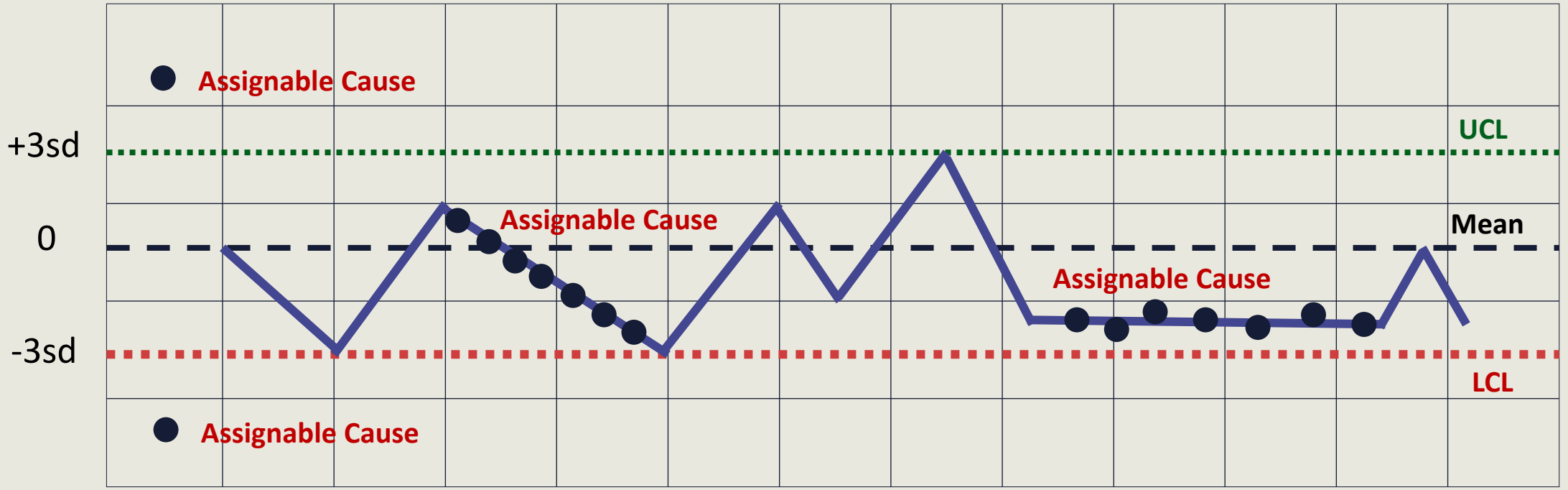
This is a “left-skewed” distribution

CONTROL CHARTS



CONTROL CHARTS

- A process is out of control when 1 data point **exceeds** a control limit
- A process is out of control when 7 **consecutive (Rule of 7)** plot points are above or below the mean within the control limits
- A process is out of control when 7 **consecutive (Rule of 7)** plot points trend up or trend down within the control limits.



Research an assignable cause for out of control processes

CONTROL CHARTS

Your Upper Control Limit (UCL) is 11, and the Lower Control Limit (LCL) is 3. Which of these is out of control?

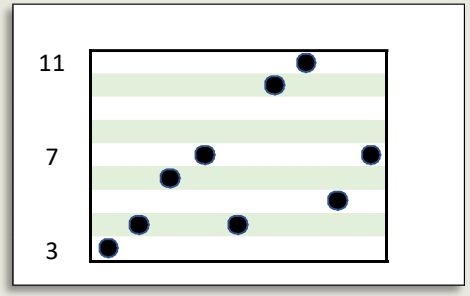
A) 3 4 6 7 4 10 11 5 7

B) 4 4 6 6 3 5 4 5 11

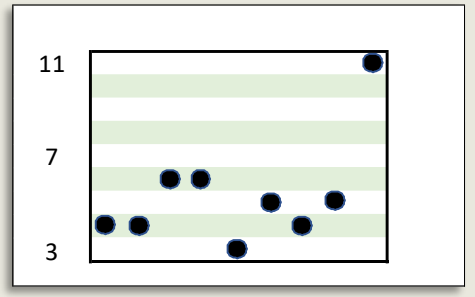
C) 5 8 9 3 3 3 3 3 8

D) 8 8 9 7 4 11 11 7 9

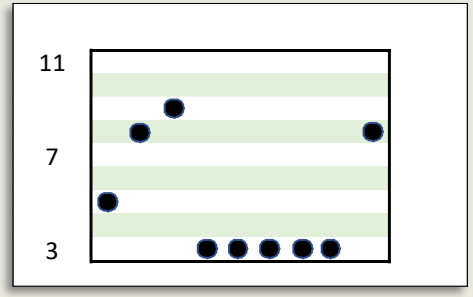
A



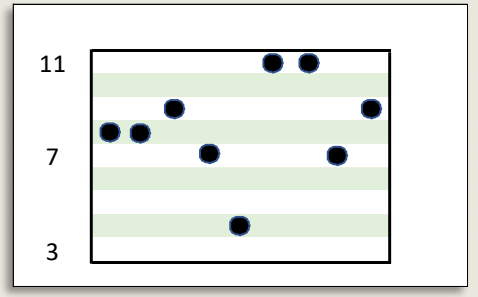
B



C



D



CONTROL CHARTS

Your Upper Control Limit (UCL) is 50, and the Lower Control Limit (LCL) is 12. In which circumstance do you look for an assignable cause?

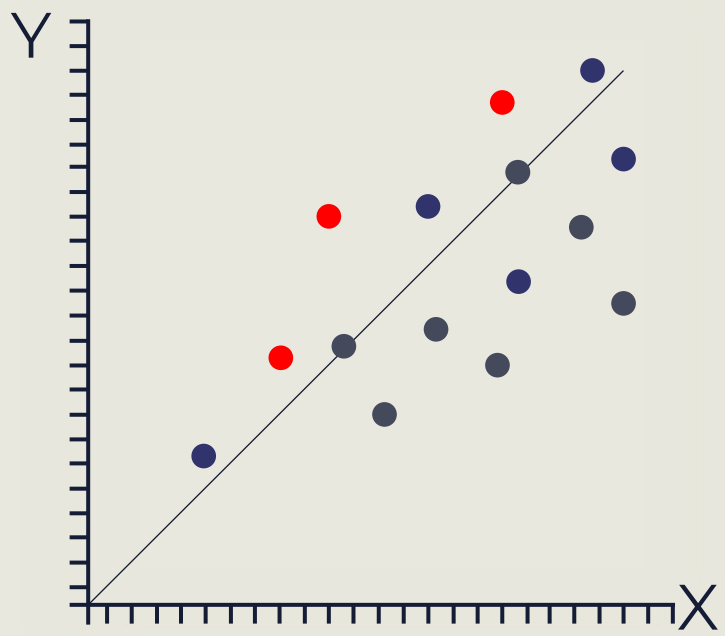
A) 20 29 28 12 15 40 30 45

B) 50 32 38 28 48 47 48 40

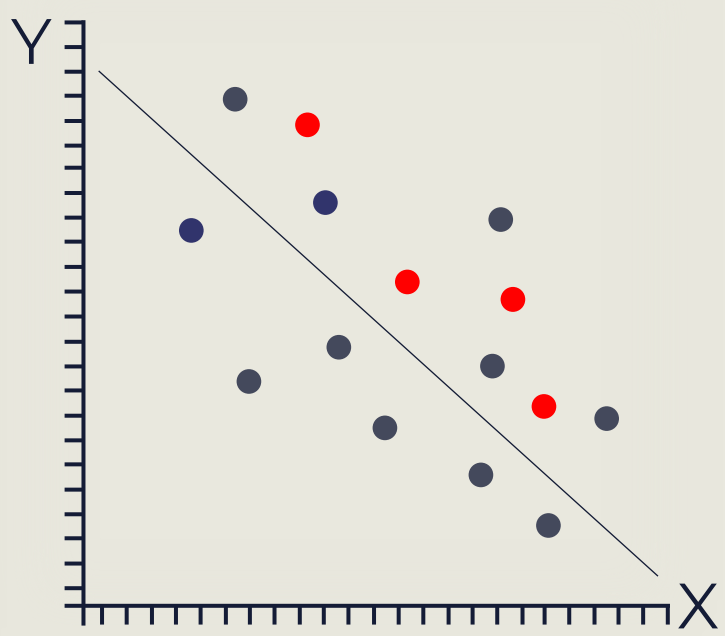
C) 30 40 25 11 30 48 16 30

D) 30 33 32 18 28 45 30 20

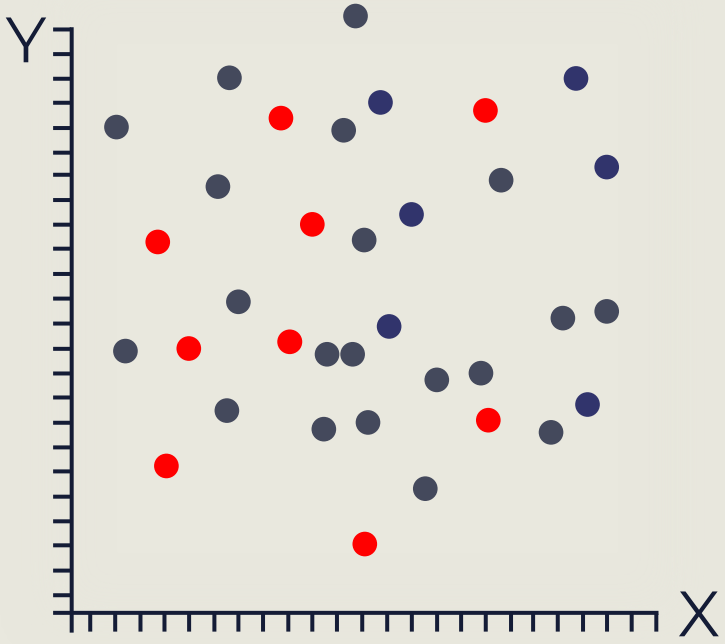
SCATTER DIAGRAMS



Positive correlation



Negative correlation



No correlation

Note that correlation does not necessarily mean causation

QUALITY AND CHANGE CONTROL

Types of change requests:

Preventive Action

- Aligning the project work to the project plan
- Improving and documenting processes
- Preventing defects
- This is conformance
- It is relatively inexpensive
- It includes little to no customer exposure

Corrective Action

- Realigning the project work to the project plan
- Reaffirming processes
- Adhering to processes
- This is conformance
- It is relatively inexpensive
- It includes little to no customer exposure

Defect Repair

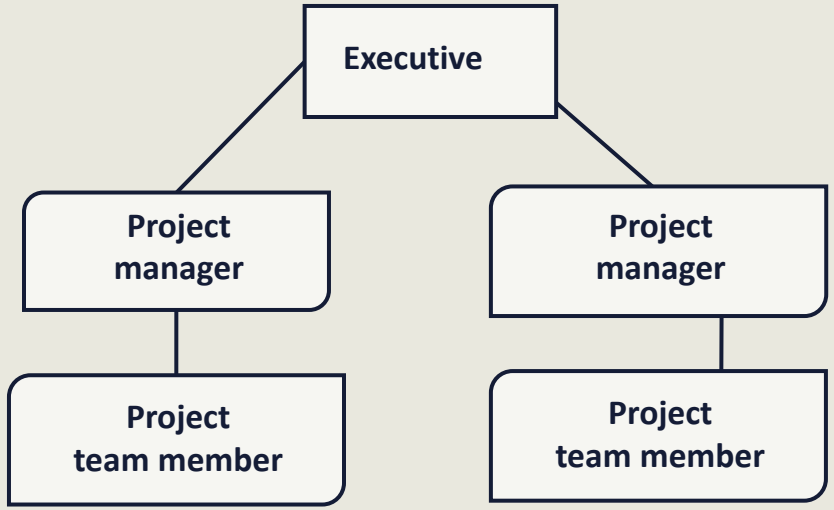
- Modifying a nonconforming product or component
- This is nonconformance
- It is expensive
- It includes high customer exposure

RESOURCE TERMINOLOGY

Dedicated resources

PM can hire staff

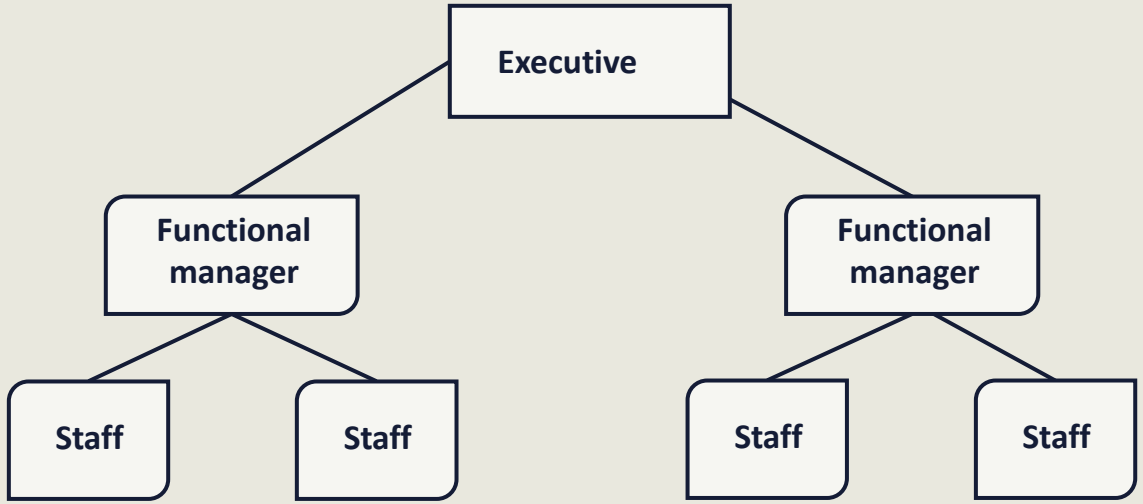
Projectized organization



Shared resources

PM must negotiate for staff

Functional organization

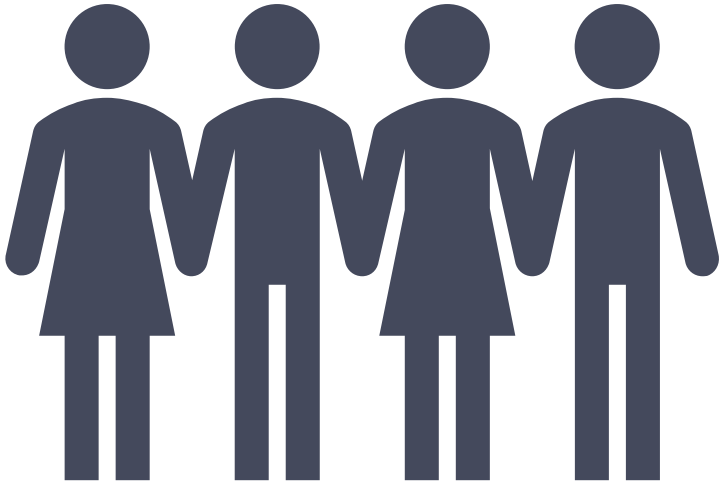


RESOURCES TERMINOLOGY

Overallocated resources

Benched resources

The project manager is responsible for coordinating the right resources at the right time.



RESOURCES MANAGEMENT PLAN

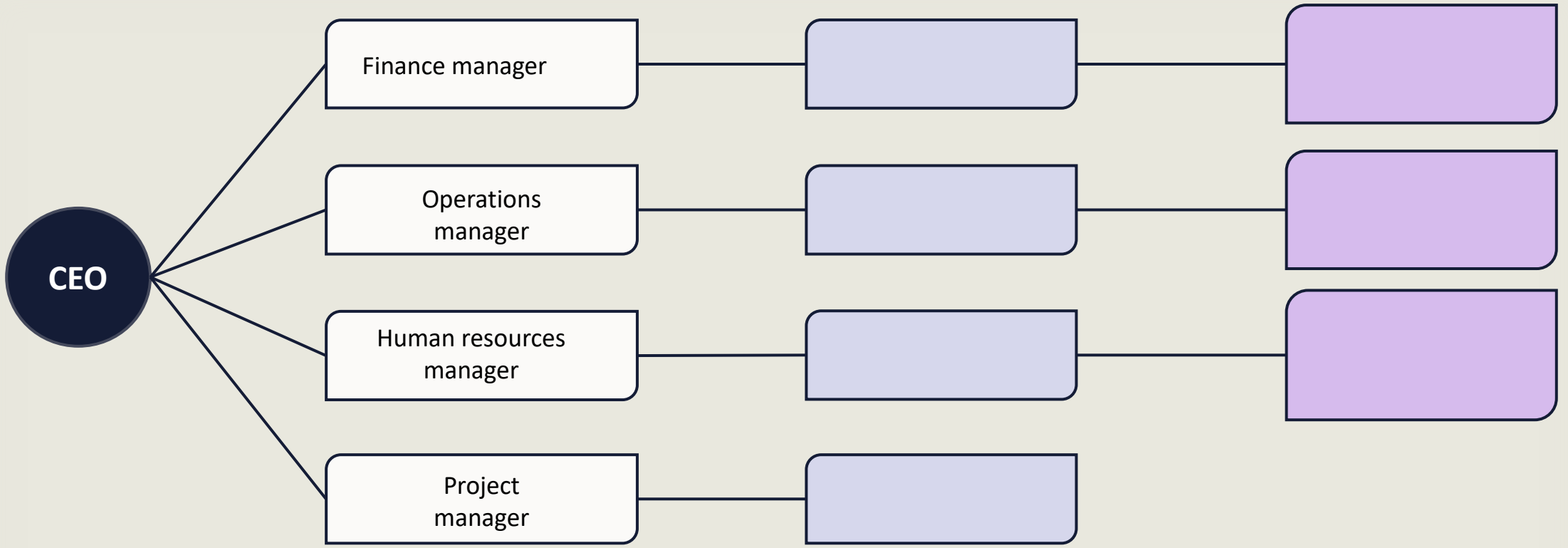
How should the resources be staffed, managed and released?

Resource Planning Documents

- **Resource breakdown structure**
- **Resource calendars**
- **Project staff assignments**
- **Team performance assessments**

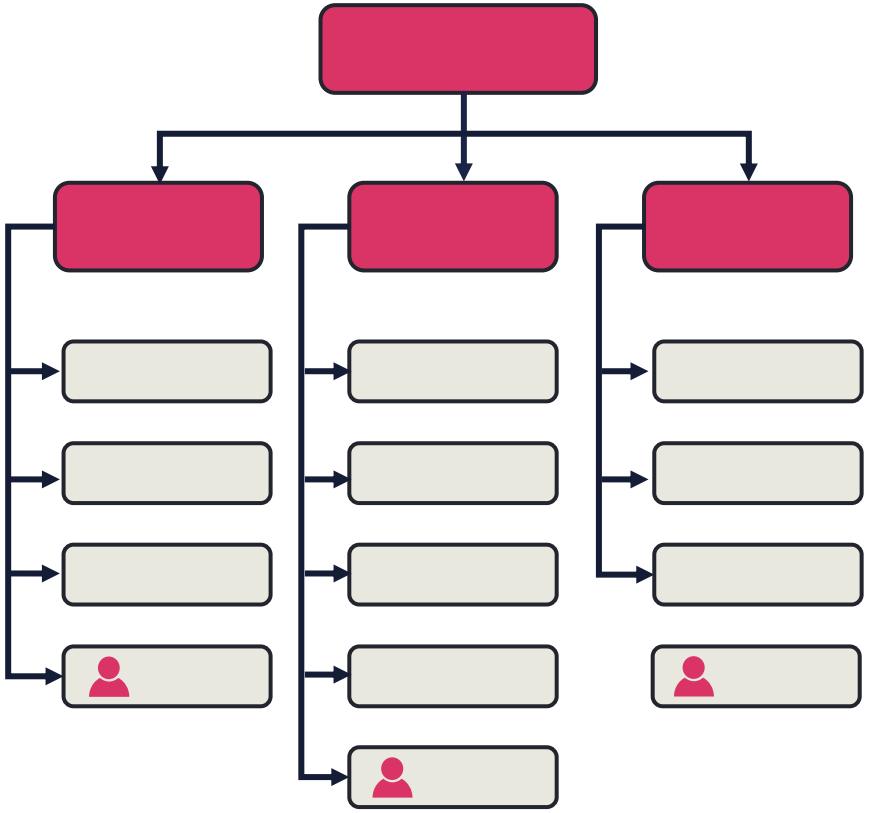
ORGANIZATIONAL BREAKDOWN STRUCTURES (OBS)

- Shows departments and teams within the organization
- Does not specify job assignments or individual names



RESOURCE BREAKDOWN STRUCTURE (RBS)

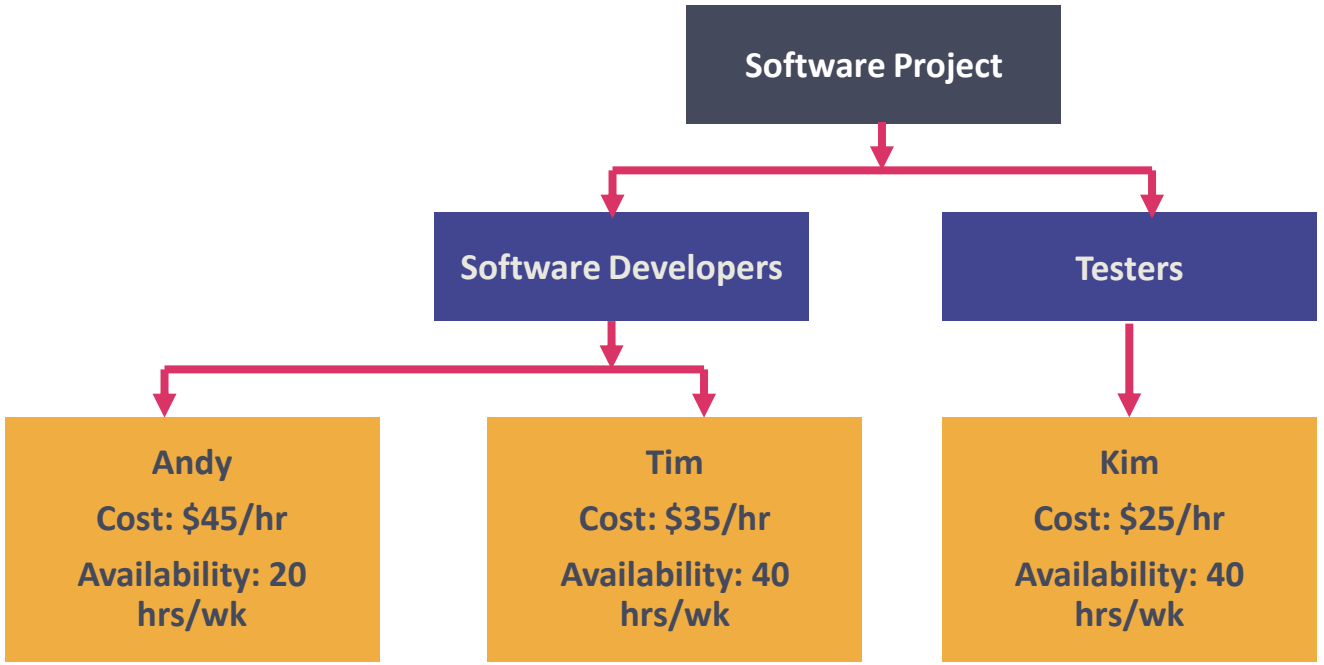
- Breaks project work into resource categories
- Shows individuals and assignments



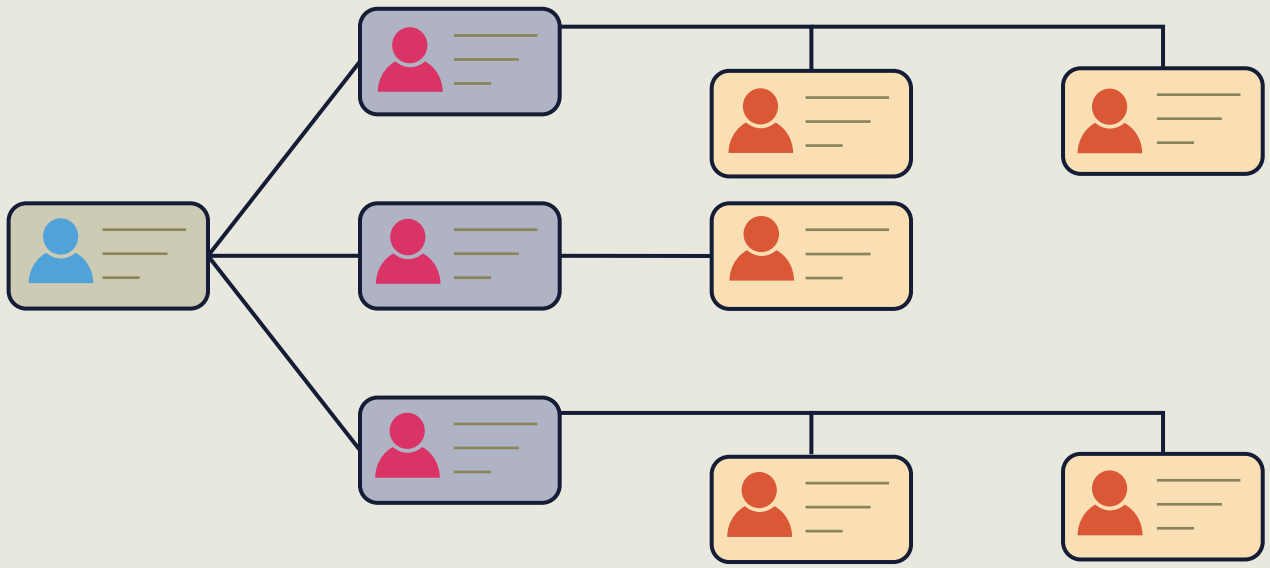
RESOURCE BREAKDOWN STRUCTURE

(RBS)

- Visually simple
- Breaks resources into categories
- Organizes data
- Reports on utilization



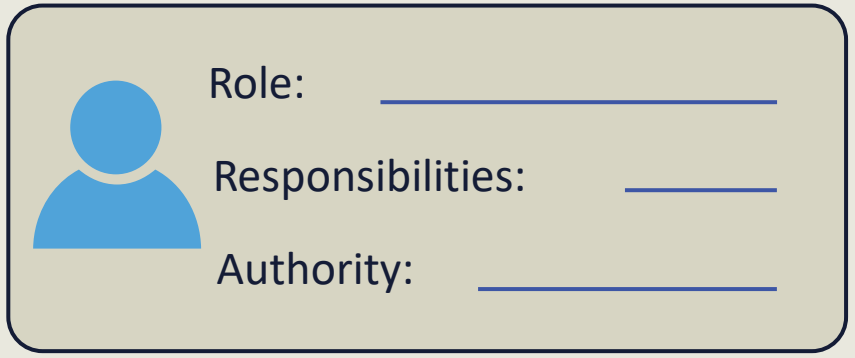
ORGANIZATION CHARTS AND POSITION DESCRIPTIONS



Hierarchical type chart

RAM (Responsibility Assignment Matrix)

	Activity	Activity	Activity	Activity
Name		X		
Name	X			
Name		X		
Name				X
Name			X	



Text-oriented format

MULTI-CRITERIA DECISION ANALYSIS

Candidates	Availability	Cost	Experience	Ability	Knowledge	Skills	Total score
D. Alford	3	2	3	3	3	2	16
C. Dillon	3	1	3	3	3	3	16
L. Ricci	1	3	2	2	2	2	12
J. Edwards	3	2	2	1	1	1	10
F. Philips	1	2	1	3	2	2	11
L. Tan	2	1	3	2	3	3	14
J. Fernandez	2	3	1	1	1	1	9
S. Branson	1	2	1	2	1	2	9

GLOBALLY DISTRIBUTED TEAMS

Benefits and Challenges

- Language/jargon
- Cultural differences
- Time zones
- Assumptions
- Technology
- Misunderstanding

VIRTUAL TEAMS

Advantages

- **Talent is not limited to one geographic region**
- **Around the clock coverage**
- **Little or no travel or relocation expenses**
- **Ability to work from home**

VIRTUAL TEAMS

Disadvantages

- Miscommunications
- Time zone barriers
- Difficult to share experiences and knowledge
- Feelings of isolation
- More difficult to monitor performance
- Hard to develop bonds between team members

VIRTUAL TEAMS

Team Member Needs

- Shared goals
- Frequent check-ins
- Clear roles and expectations

Areas of Focus

- PM facilitation
- Team dynamics
- Shared vision
- Purposeful communication

VIRTUAL TEAM TOOLS

- Videoconferencing tools
- Collaboration tools
- Task boards

ACQUIRING RESOURCES

In-house

- Pre-assignment
- Negotiation with functional manager

Third Party

- Acquisition
- Procure from a vendor

STAFFING PLAN

Staffing Plan:

- Resource skills
- Resource availability
- Outsourcing needs
- Union contracts
- Costs associated with skill levels
- Release criteria
- Training needs
- Rewards
- Safety policies

Enterprise Environmental Factors (EEFs)

- How do they influence staffing decisions?

PROJECT STAFF ASSIGNMENTS

Project name: Customer Support Contact Center

Prepared by: Jack Ellison

Name	Function Area/ Vendor	Project role	E-mail	Phone
Julio Fernandez	HR Department	Recruiter	jfernandez@dataco.org	(202) 555-1111 x 2
Fiona Philips	Testing Unit	Software testing	fphilips@dataco.org	(202) 555-1111 x 3
Julia Edwards	IT Department	Install and implement software	jedwards@dataco.org	(202) 555-1111 x 7

RESPONSIBILITY ASSIGNMENT MATRIX (RAM)

Team members	Advertise	Interviews	Onboarding	Orientation	Equipment	Training
D. Alford				X		
C. Dillon				X		X
L. Ricci	X	X				
J. Edwards			X			
F. Philips				X		
L. Tan					X	
J. Fernandez						X
S. Branson						X

RACI CHART

*A **RACI Chart** is a type of Responsibility Assignment Matrix, or RAM.*

Team members	Test Software
D. Alford	**R, C**
C. Dillon	**R**
L. Ricci	**A**
J. Edwards	**R**
F. Philips	**C**
L. Tan	**I**
J. Fernandez	**C**
S. Branson	**I**

R = Responsible (does the work)
A = Accountable (must answer for the work)
C = Consult (subject matter expert)
I = Inform (should be notified about status)

- Team members can have > 1 role
- Only one person can be accountable

*A **RASI Chart** is another type of Responsibility Assignment Matrix, or RAM. RASI is an acronym that stands for Responsible, Accountable, Support, and Informed.*

INVESTING IN TEAM MEMBERS

TEAM DEVELOPMENT

Strategies to improve team performance:

- Set high performance and technical expectation benchmarks
- Recognize individual efforts and contributions
- Quickly identify problems

Coach

- Develops and maximizes both team and individual performance
- Help team apply Agile practices in daily work
- Facilitate relationships between development team and customer
- Keep focus on goals of the project

Ensure team members are energized

Focus on one task at a time

INTERPERSONAL SKILLS

- **Leadership**
- **Team building**
- **Motivation**
- **Communication**
- **Influencing**
- **Decision making**
- **Political and cultural awareness**
- **Negotiation**
- **Trust building**
- **Conflict management**
- **Coaching**

TEAM BUILDING ACTIVITIES

- **Help individual team members work together effectively**
- **Particularly valuable when team members operate from remote locations without the benefit of face-to-face contact**
- **Informal communication and activities can help in building trust and establishing good working relationships**

SMART GOALS

Specific

Measurable

Attainable

Results oriented

Timely

Run my first 5K race. Daily goals:
Week 1: run/walk combo for 30 minutes (15:00 avg mile)
Week 2: run 10 minutes/walk 20 minutes (13:00 avg mile)
Week 3: run/walk 50% each (12:00 avg mile)
Week 4: run 20 minutes, walk 10 minutes (11:00 avg mile)
Week 5: run the 5K (10:00 avg mile)

RECOGNITION AND REWARDS

- Award based on attaining specific goals
- Follow Resource Management Plan
- Money or intangibles are acceptable
- Reward must be valued by the individual
- Cultural differences should be considered
- People are motivated by growth and challenge
- Give recognition throughout the life cycle

STAGES OF TEAM DEVELOPMENT:
TUCKMAN LADDER

1. Forming
2. Storming
3. Norming
4. Performing
5. Adjourning

Productivity – none to low
Management style - directive

The management style should be situational, depending on the team's stage of development

STAGES OF TEAM DEVELOPMENT:
TUCKMAN LADDER

1. Forming
2. Storming
3. Norming
4. Performing
5. Adjourning

Productivity – low
Management style - coaching

STAGES OF TEAM DEVELOPMENT:
TUCKMAN LADDER

1. Forming
2. Storming
3. Norming
4. Performing
5. Adjourning

Productivity – medium
Management style – supporting

The management style should be situational, depending on the team's stage of development

STAGES OF TEAM DEVELOPMENT:
TUCKMAN LADDER

1. Forming
2. Storming
3. Norming
4. Performing
5. Adjourning

Productivity – high
Management style - facilitating

STAGES OF TEAM DEVELOPMENT:
TUCKMAN LADDER

1. Forming
2. Storming
3. Norming
4. Performing
5. Adjourning

RULES FOR FEEDBACK

- Give praise immediately
- Make positive feedback public
- Be specific
- Consider the receiver
- Do it often
- Don’t wait for the big successes
- Be sincere

PERSONNEL ASSESSMENT TOOLS

Gives insight into strengths and weaknesses

Manage team preferences, aspirations, and how they process and organize information

Facilitates productive teams

Tools include

- Attitudinal surveys
- Specific assessments
- Structured interviews
- Ability tests
- Focus groups

PERSONALITY PROFILE ASSESSMENTS

Whole Brain Thinking
Ned Herrmann

Social Style Model
TRACOM

Theory of Psychological Types
Carl Jung

DiSC Assessment Model
William Moulton Marston

Myers-Briggs Type Indicator (MBTI)
Katherine Cook Briggs and Isabel Briggs Myers

True Colors Methodology
Don Lowry

INVESTING IN TEAM MEMBERS

I have tried to coach a team member but nothing I do helps. He is so disruptive, and it is hurting the team's performance. What should I do?

Project Manager

%*#&!

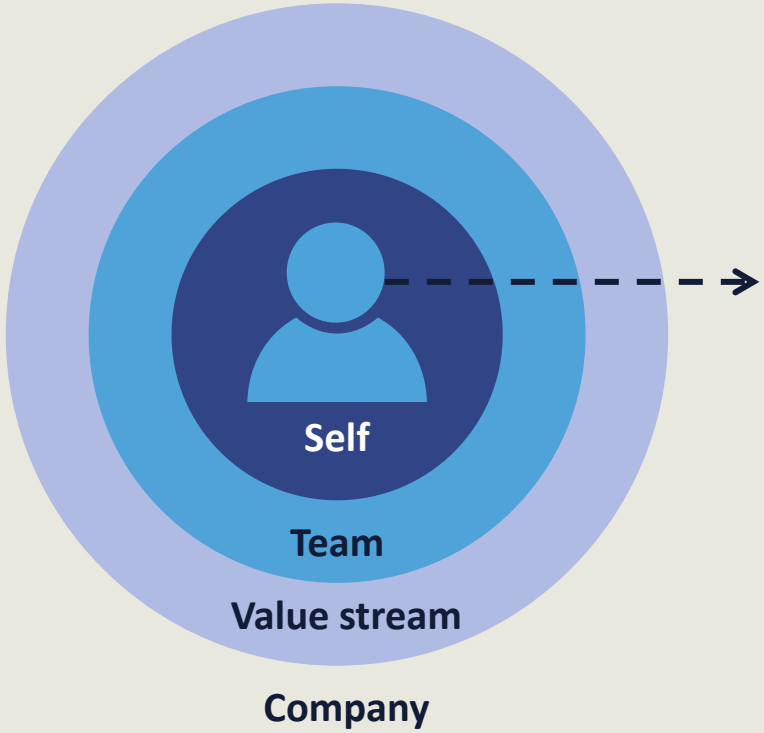
Employee

TEAM MOTIVATION

- Goals help the staff to channel their energy productivity
- Feedback helps the staff to adjust their direction to attain the goals
- Action plans outline the tasks that are necessary to obtain the goals
- Individuals that are committed to the goals will have higher productivity
- Employee satisfaction is related to participating in the goal setting especially when top management is also committed to the goals.

Line of Sight

- how the organization works
- the strategic goals, and
- how my work contributes to success.



MCGREGOR'S X AND Y THEORIES

Theory X

(authoritarian management style):

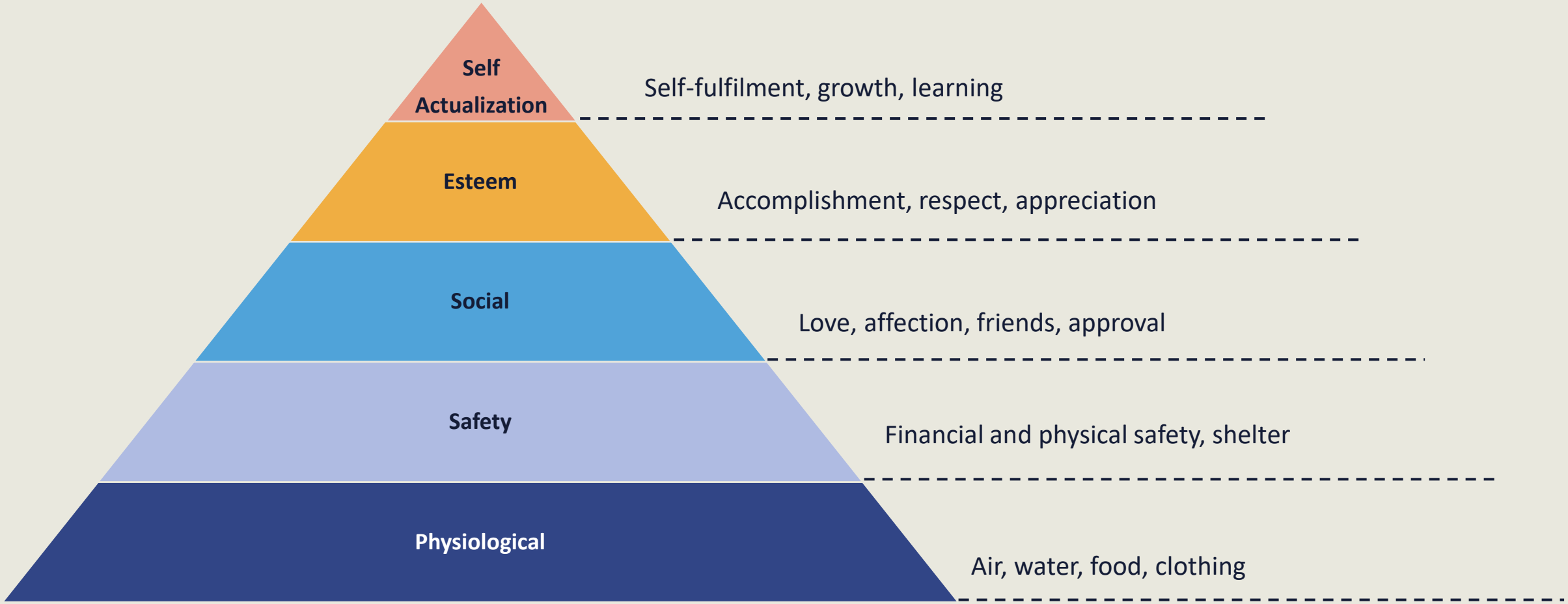
- The average person dislikes work
- People must be forced to work towards organizational objectives
- The average person prefers direction, avoids responsibility, relatively unambitious, and want security

Theory Y

(participative management style):

- Effort in work is as natural as work and play
- People apply self-control and self-direction, without external control
- Commitment to objectives is a function of rewards associated with their achievement
- People accept and seek responsibility
- Using imagination, ingenuity, and creativity in solving organizational problems is widely distributed in the population

MASLOW'S HIERARCHY OF NEEDS



MCCLELLAND'S NEEDS THEORY

Need for Achievement:

- Prefer tasks of moderate difficulty where performance is due to efforts not luck
- Desire more feedback on successes and failures

1. Provide achievement training for employees
2. Achievers prefer to work in pay-for-performance environment

Need for Affiliation:

- Prefer to spend time maintaining social relationships
- Not the most effective managers because they worry about being disliked

1. Affiliators are not as motivated in pay-for-performance environments
2. Give them the opportunity to work in groups

Need for Power:

- Desire to influence, coach and encourage others to achieve
- Concerned with discipline and self respect
- Top managers have a high need for power and a low need for affiliation

1. Be aware of the positive and negative side to power
2. Facilitate the positive influence by allowing these individuals to accomplish group goals and coaching others
3. Keep alert for an "If I win, you lose" mentality

HERZBERG'S THEORY OF HYGIENE

Hygiene/Dissatisfier

- Working conditions
- Policies
- Administrative practices
- Salary and Benefits
- Supervision
- Status
- Job security
- Fellow workers
- Personal life

Motivators/Satisfiers

- Recognition
- Achievement
- Advancement
- Growth
- Status
- Responsibility
- Job challenge

CONFLICT MANAGEMENT

Sources of conflict

- Scarce Resources
- Scheduling Priorities
- Personal Style

Types of conflict

- Dysfunctional vs. Functional

Desired outcomes of conflict

- Agreement
- Stronger Relationships
- Greater Productivity

Strategies to reduce conflict

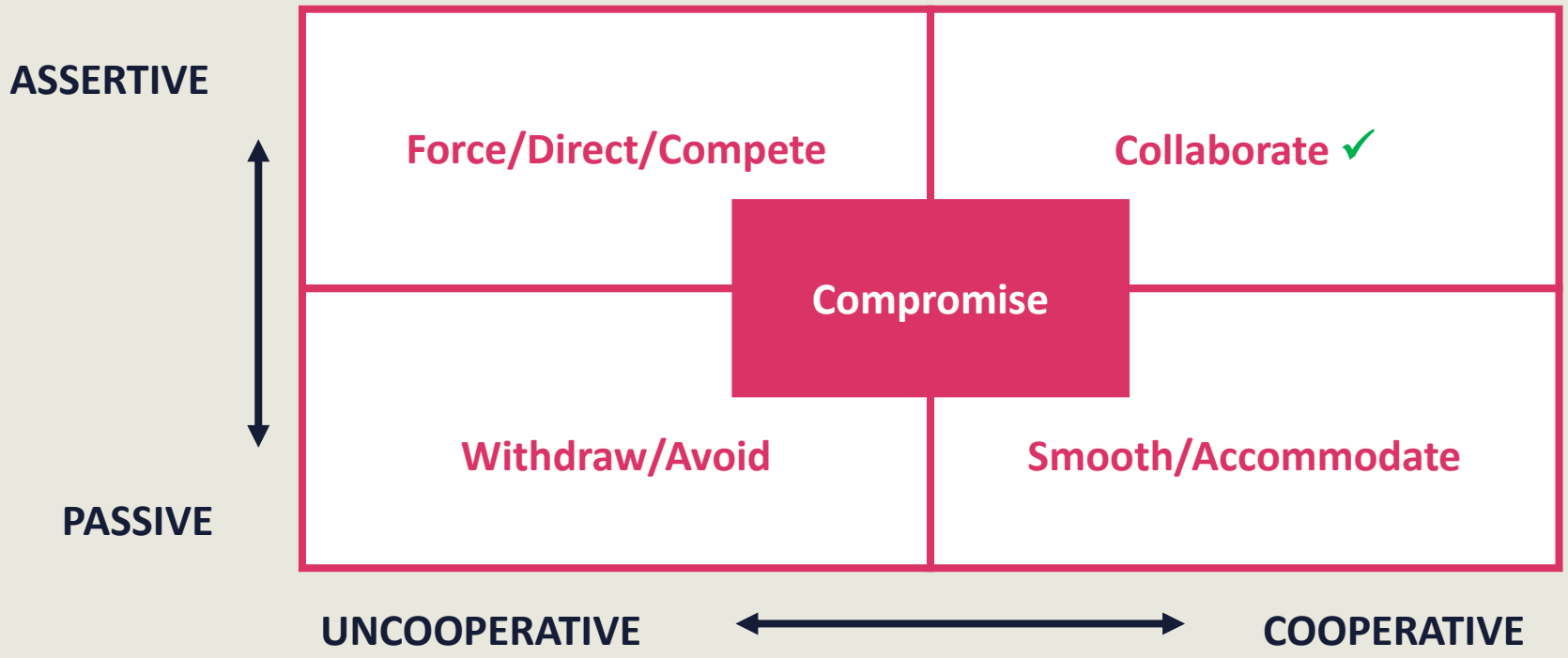
- Address conflict early and in private using a direct, collaborative approach
- Support team ground rules and group norms
- Clearly define roles and responsibilities
- Plan for communications

Roles in conflict resolution

- Team members are initially responsible for resolving conflict
- PMs can help facilitate resolutions for escalated conflict
- Formal disciplinary procedures may be needed in extreme circumstances

THOMAS KILMANN MODEL
FOR HANDLING CONFLICT

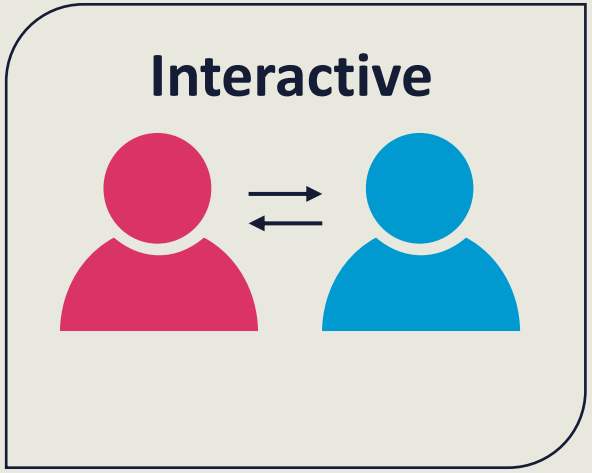
The Thomas Kilmann Conflict Mode Instrument is a model for handing conflict:

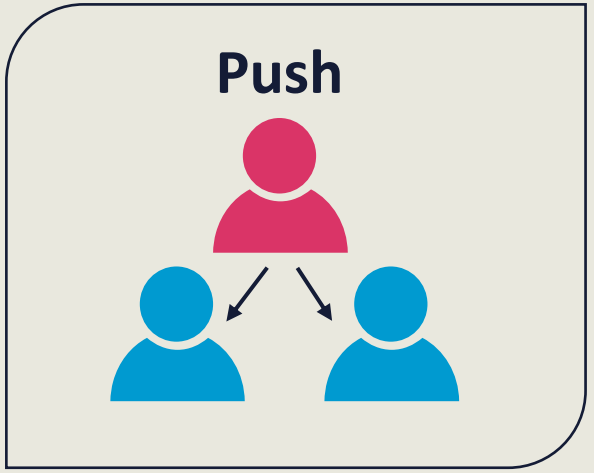


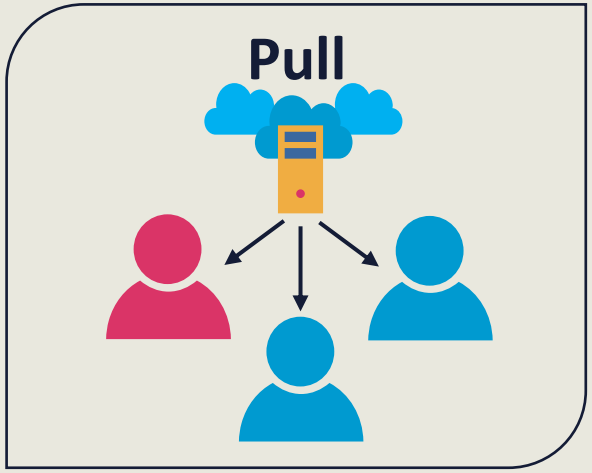
COMMUNICATION METHODS

Sharing platforms

- Information portal
- Communities of interest
- Answering specific requests
- Training
- Newsletters
- Publications
- Team meetings
- One-on-one meetings







PROVIDE ONLY THE INFORMATION NEEDED

Too much information can lead to

- Confusion
- Unproductive actions
- Wasted time
- Frustration and doubt
- Misunderstanding

Stakeholders' information needs differ

Targeted properly

- Right format
- Right time
- Right audience

STAKEHOLDER COMMUNICATION REQUIREMENTS

Name	Contact	Role	Communication Preferences	
			Frequency	Method
David Ross	213-555-3400 dross@email.watchdog	Environmental lawyer and watchdog	Weekly	E-mail
Rashid Sufi	555-555-1234 rsufi@projectteam.com	Subject Matter Expert	As needed	Email or phone

WITH WHOM TO SHARE

Choosing target audience

- Who will benefit?
- Who will find it relevant?

Different stakeholders require different information

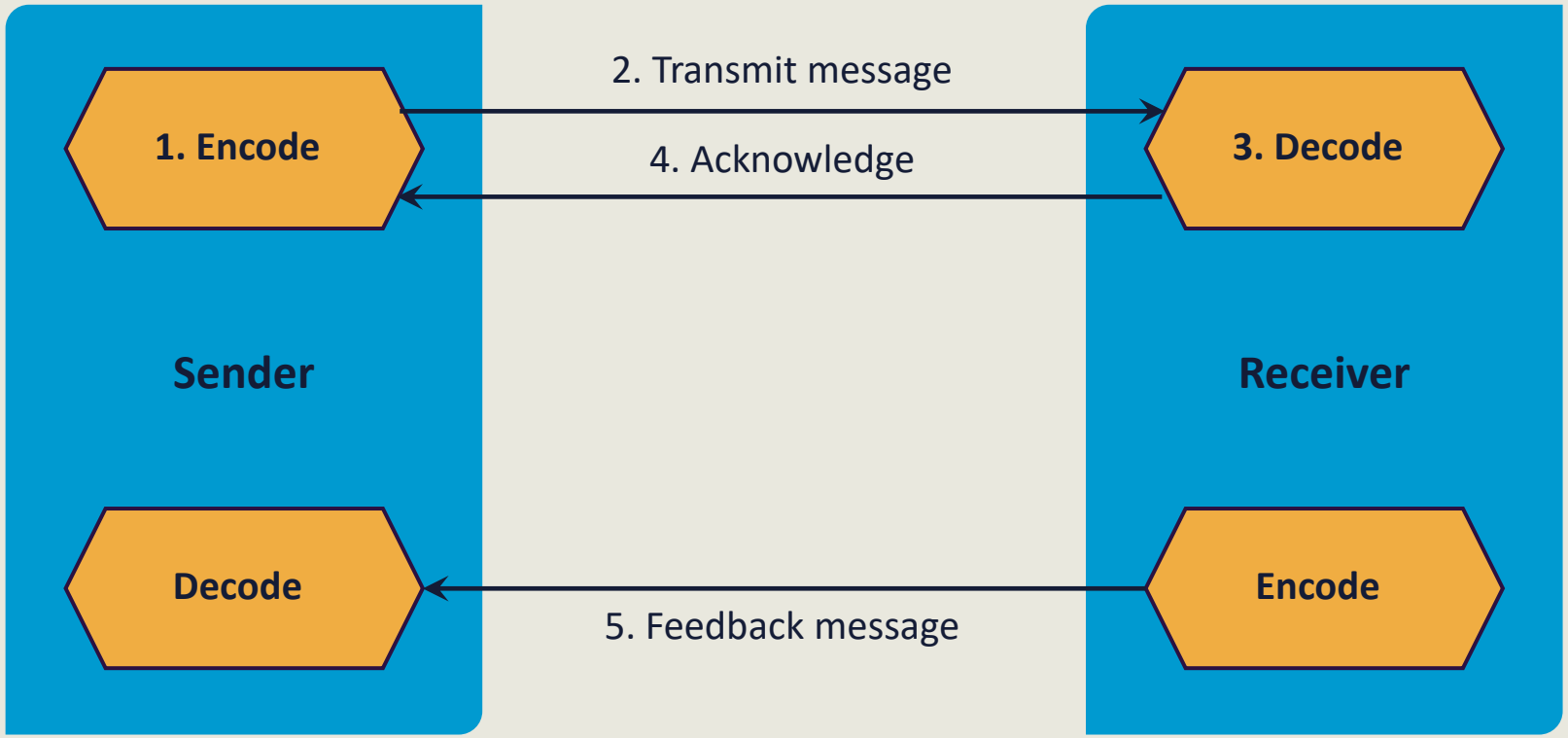
- Upper management
- Project managers

When to Share

- Report frequently
- Start as early as possible
- Only after proper analysis

COMMUNICATION MODEL

Basic communication model



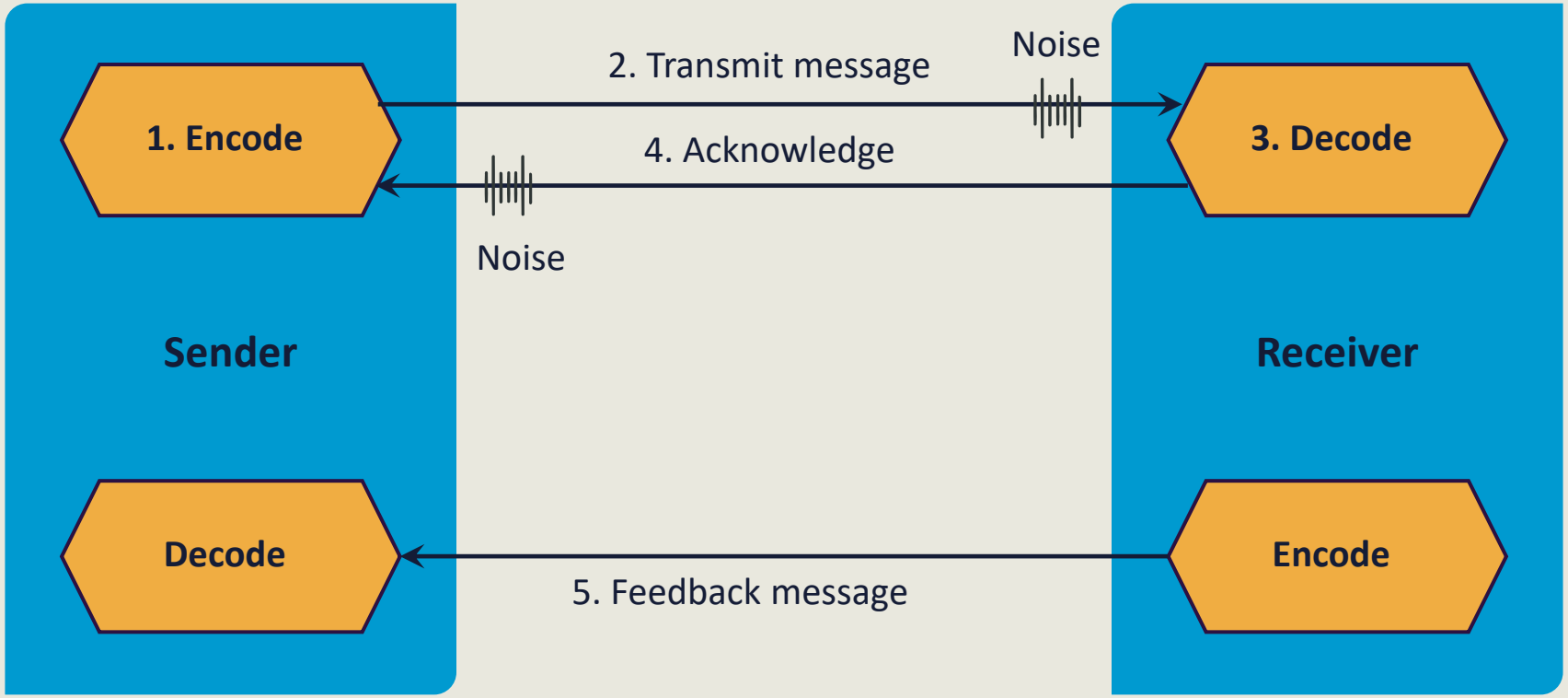
COMMUNICATION MODEL

Misunderstandings

Language differences

Technology problems

Noise



TECHNOLOGY CONSIDERATIONS

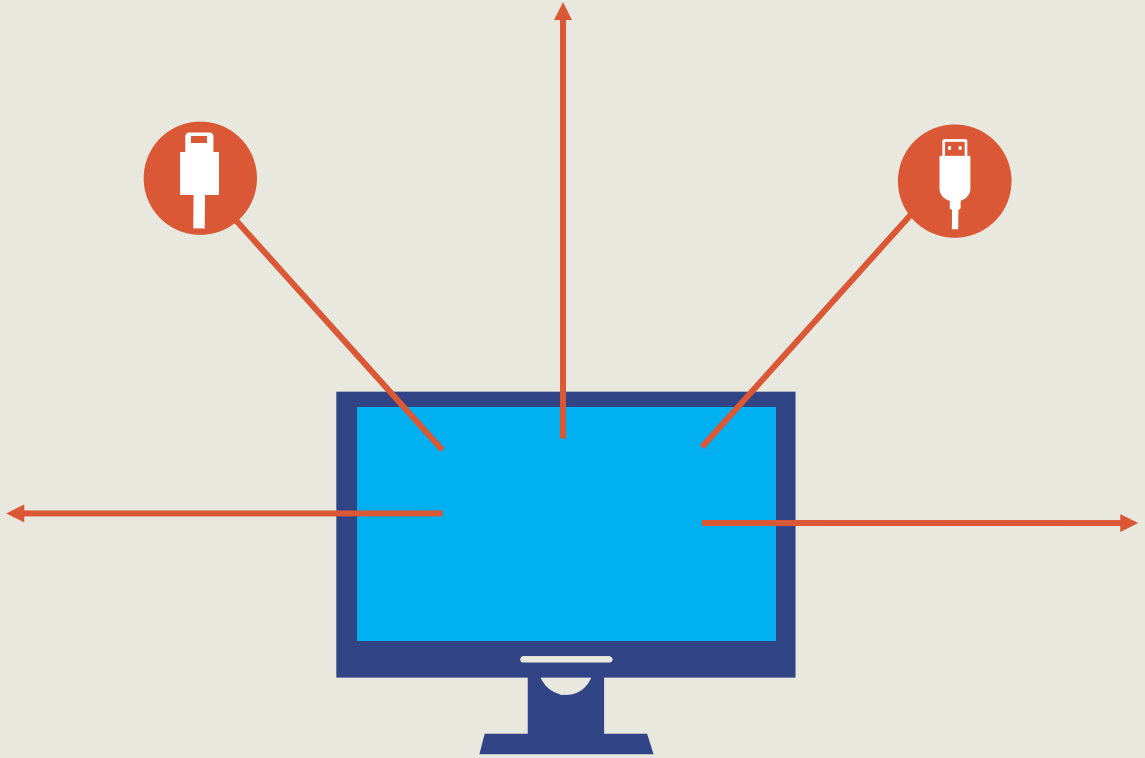
Urgency

Availability

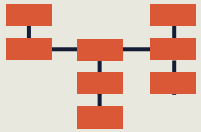
Ease of use

Project environment

Sensitivity of the information

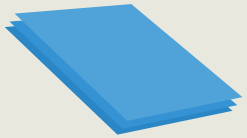


COMMUNICATION DIMENSIONS



Formal / Informal

Official / Unofficial



Internal / External

Written / Oral

Vertical / Horizontal

Verbal / Non-Verbal

COMMUNICATION CHANNELS

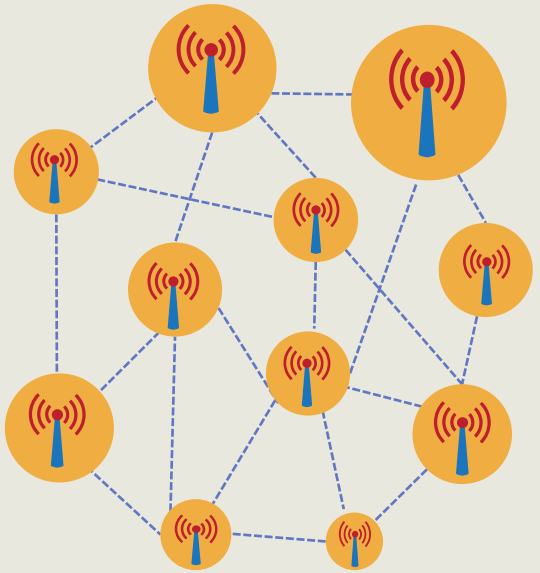
Communication Channels Formula

$$\frac{n\,(n-1)}{2}$$

EXAMPLE:

You have 5 people on your team. How many communication channels are there?

$$\frac{5(4)}{2} = \frac{20}{2} = 10$$



COMMUNICATION CHANNELS

“Other”

There are 6 people on the team.

N = 6

There are 6 “other” people on the team. N = 6 + 1 (remember to count yourself)

N = 7

COMMUNICATION CHANNELS

“More”

There are 6 people on the team.
N = 6

$$\frac{6(5)}{2} = \frac{30}{2} = 15$$

Three “more” people are added.
Now **N = 9**

$$\frac{9(8)}{2} = \frac{72}{2} = 36$$

How many “more” communication channels are there?
This requires two calculations!

Step 1 – Calculate for N = 9 (How many channels there are now)
Step 2 – Calculate for N = 6 (How many channels there were before)
Step 3 – The difference is how many “more”

POLITICAL AWARENESS

Understanding the power and influence of stakeholders and their relationships with the project. Being willing and able to recognize these relationships, structure communications and manage stakeholder engagement within this political environment.

WHAT IS RISK?

Project risks:

- Events that might happen
- Would have an impact on objectives

Negative risk = threat

Positive risk = opportunity

Be able to spot risks

Determine if they are threats or opportunities

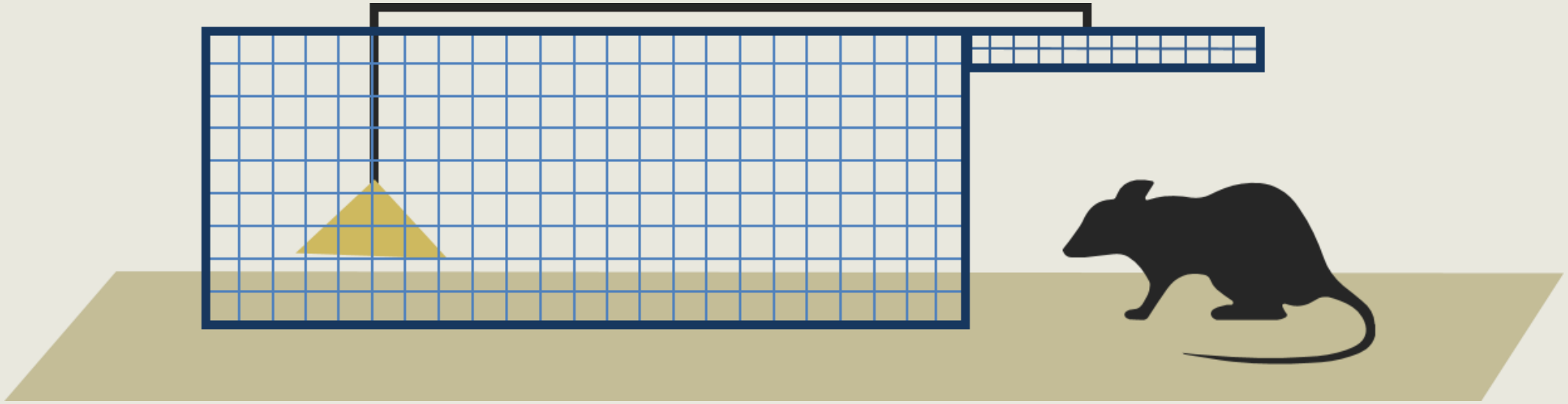
Add identified risks to a risk register

Seek input from subject matter experts

RISK TERMS TO KNOW FOR THE EXAM

Risk Appetite

The degree of uncertainty an entity is willing to take on in anticipation of a reward



Risk tolerance is a **“range”**.

RISK TERMS TO KNOW **FOR THE EXAM**

Risk Tolerance

The degree, amount, or volume of risk that an organization or individual can withstand.

RISK TERMS

Risk Threshold

Refers to measures along the level of uncertainty or the level of impact at which a stakeholder may have a specific interest. Below that risk threshold, the organization will accept the risk. Above the threshold, the organization will not tolerate the risk.

Risk threshold is a “tipping point”.

DEFINITION OF IMPACT SCALES

Project Objectives	Very Low	Low	Moderate	High	Very High
Cost	Insignificant Cost increase	<5% Cost increase	5-15% Cost increase	10-20% Cost increase	>30% Cost increase
Schedule	Insignificant schedule slippage	Schedule slips <5%	Overall schedule slips 5-15%	Overall schedule slips 10-20%	Overall schedule slips >30%
Scope	Scope decrease slightly noticeable	Minor areas of scope affected	Minor areas of scope affected	Scope reduction Unacceptable to client	Project end item is useless
Quality	Quality degradation slightly noticeable	Only very demanding applications affected	Quality reduced, Requires client approval	Quality reduced, Unacceptable to the client	Project end item is unusable

PLAN RISK MANAGEMENT

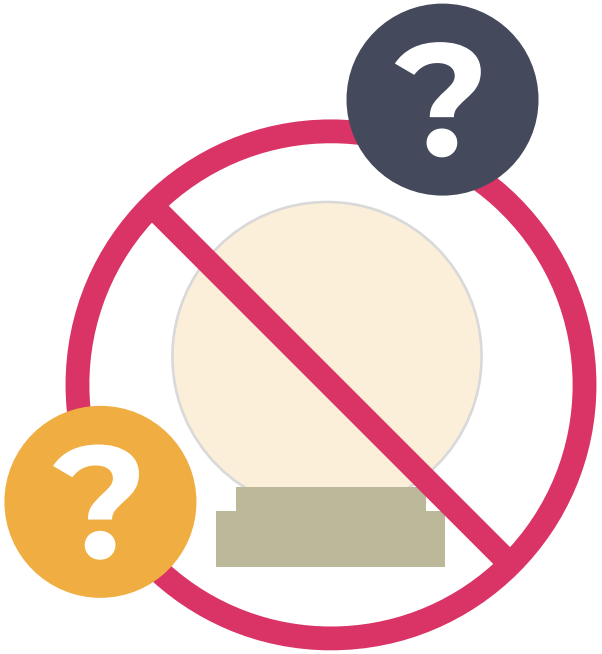
RISK MANAGEMENT PLAN

- Approach to managing risk
- Tools and methodology
- Team responsibilities
- Risk categories

Governance

- Procedures for spending and approvals
- Meetings, documentation, and reporting

ASSUMPTIONS ANALYSIS



FUTURE

Assumption. A factor in the planning process that is considered to be true, real, or certain without proof or demonstration

Assumptions Analysis. A technique that explores the accuracy of assumptions and identifies risks to the project from inaccuracy, inconsistency, or incompleteness of assumptions

We have to make certain assumptions during planning

Ex. Prices of raw materials will remain steady

Ex. Vendors will follow through on commitments

Ex. Resources will remain available

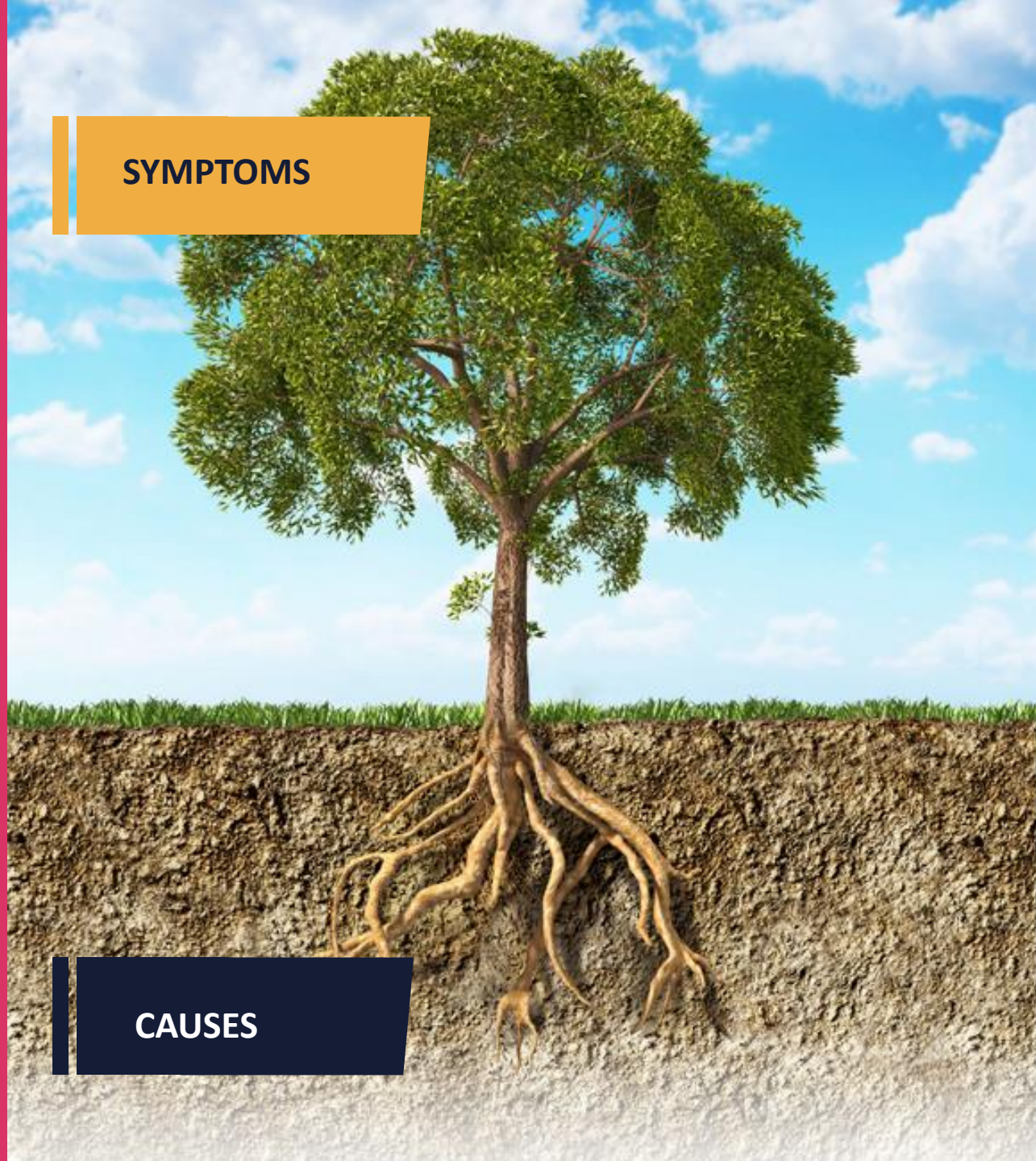
Inaccurate assumptions contribute to risk

Root Cause Analysis

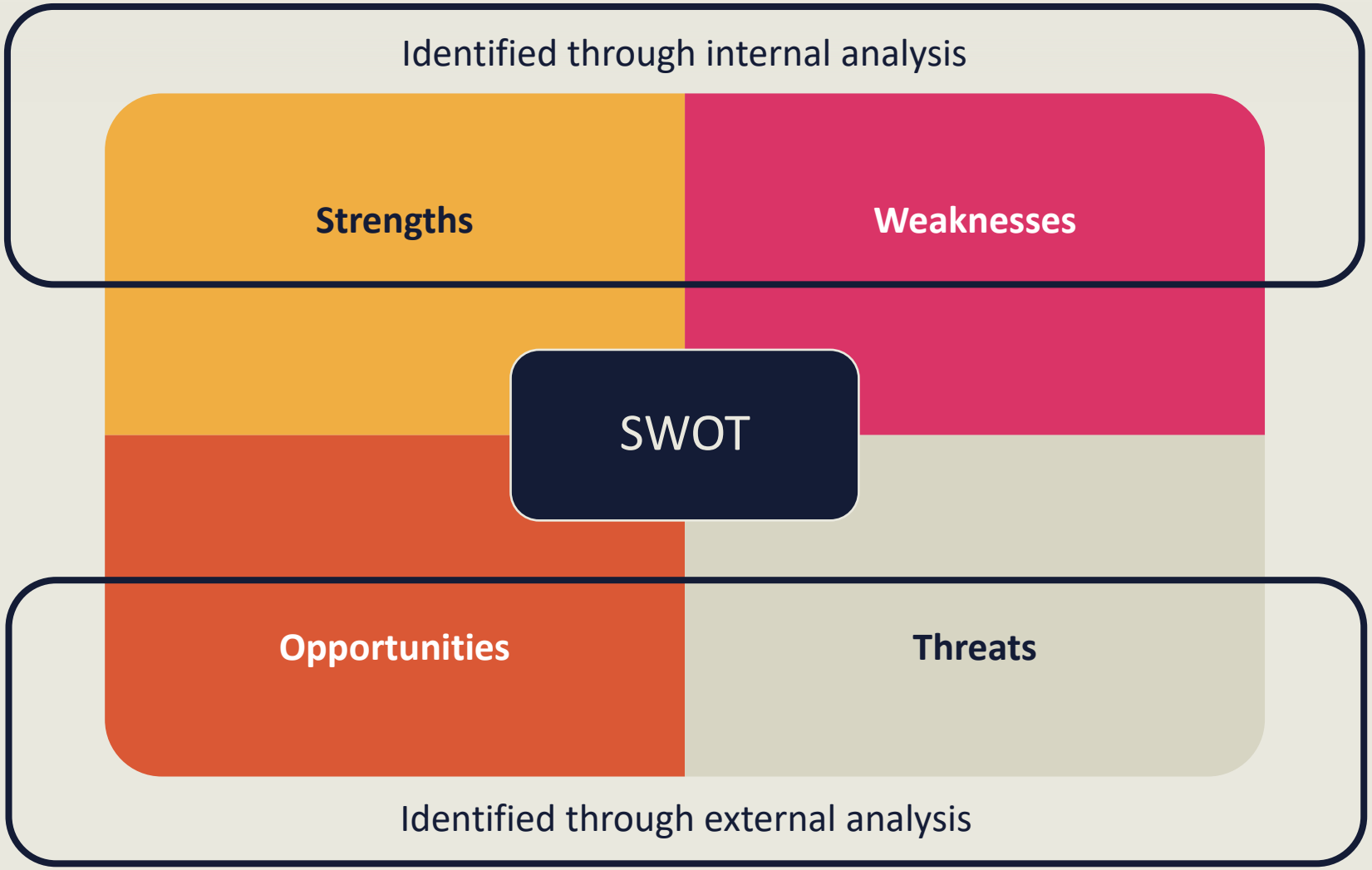
- What happens “if”…?
- The Five Whys
- Cause and Effect diagrams
- Checklists
- Pre-mortem

Analysis Pitfall

- Addressing proximate causes may not solve the problem
- Systemic problems will cause more failures if not addressed



SWOT ANALYSIS



SWOT ANALYSIS EXAMPLE

Cell	Action
S - O	Exploit the opportunities using the strengths
S - T	Avoid threats using the strengths
W - O	Turn weakness into strength using opportunities
W - T	Fix weakness

PROMPT LIST

A list of general risk categories that can be used to help generate ideas about individual risks that could affect the project.

Examples:

VUCA (volatility, uncertainty, complexity, ambiguity)

PESTLE (political, economic, social, technical, legal, environmental)

TECOP (technical, environmental, commercial, operational, political)

RISK REGISTER

Risk Register for Project XYZ									
Identify Risks	**Root Causes**	**Probability and Impact**	**Ranking**	**Categories**	**Priorities**	**Time and Cost Objectives**	**Potential Responses**	**Risk Owners**	**Assumptions**

KNOWNS AND UNKNOWNS

Known-Unknown Risks

- Have been identified and analyzed (risk register)
- Ability to plan risk responses
- You know the risk, but not when or if it will happen
- Manage the risk or use contingency reserve

Unknown-Unknown Risks

- Have not been identified (not in risk register)
- Cannot be managed proactively
- You don’t know about the risk or its cost to the project
- Use management reserve

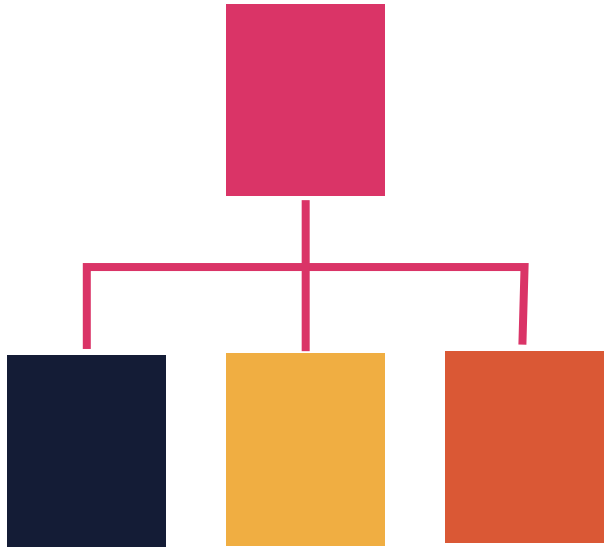
Risk Register for Project XYZ

Identify Risks	Root Causes	Probability and Impact	Ranking	Categories	Priorities	Time and Cost Objectives	Potential Responses	Risk Owners	Assumptions

RISK REPORT

The risk report is a project document which summarizes overall project risk. It lists the sources, categories and counts of risks. It is also used to provide risk metrics and trends.

Risk Report	Risk Register
• Summary of all risks • High level strategic view of all risks	• Individual risks • Focused view of each individual risk and its related details



QUALITATIVE RISK ANALYSIS

- **Rank and prioritize risks**
- **Categorize risks**

Technical

Reliance on new or unproven technology
Changing industry or tech standards

Organizational

Poor project prioritization
Inadequate or inconsistent funding
Conflict with other projects for resources

External

Legal or regulatory changes
Weather/natural disasters

DEFINITION OF IMPACT SCALES

	Very Low	Low	Moderate	High	Very High
Cost	Insignificant Cost increase	<5% Cost increase	5-15% Cost increase	10-20% Cost increase	>30% Cost increase
Schedule	Insignificant schedule slippage	Schedule slips <5%	Overall schedule slips 5-15%	Overall schedule slips 10-20%	Overall schedule slips >30%
Scope	Scope decrease slightly noticeable	Minor areas of scope affected	Minor areas of scope affected	Scope reduction Unacceptable to client	Project end item is useless
Quality	Quality degradation slightly noticeable	Only very demanding Applications affected	Quality reduced, Requires client approval	Quality reduced, Unacceptable to the client	Project end item is unusable

PROBABILITY AND IMPACT

Probability-impact combination	Priority rating
Low/Low	Low
Low/Medium	Low
Low/High	Low-Medium
Medium/Low	Low
Medium/Medium	Medium
Medium/High	High
High/Low	Low
High/Medium	High
High/High	Very High

	Threats				
.90	.09	.23	.45	.68	.81
.75	.08	.19	.38	.56	.68
.50	.05	.13	.25	.38	.45
.25	.03	.06	.13	.19	.23
.10	.01	.03	.05	.08	.09
	.10	.25	.50	.75	.90

Probability

Low ----------High

Impact

Low ----------High

QUANTIFYING COST OF RISK

INTERVIEWS AND DATA GATHERING

Interviewing techniques draw on experience and historical data to quantify the **probability** and **impact** of risks on project objectives.

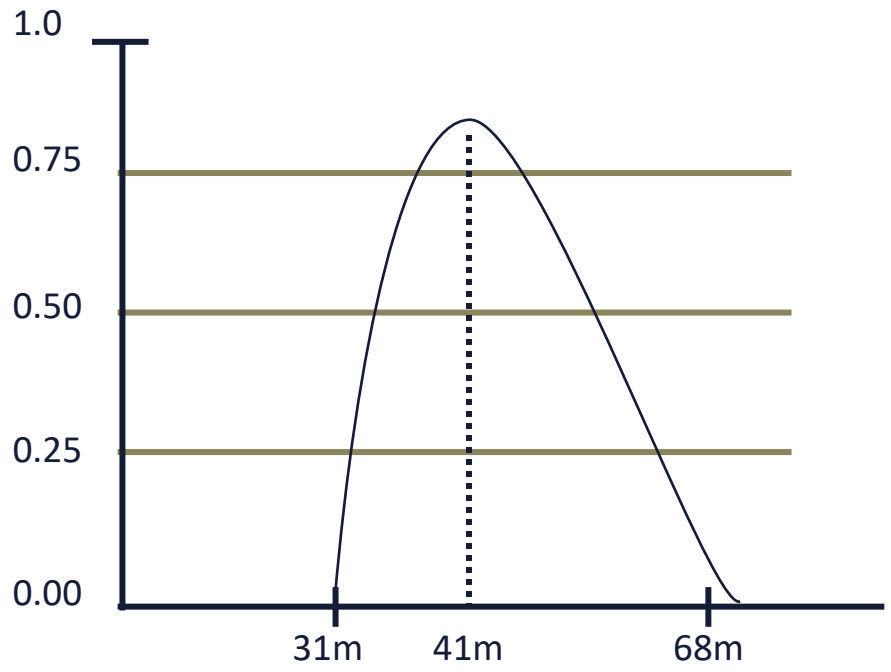
Range of Cost Estimates

Risk	Low	Most Likely	High
Risk 1	$4M	$6M	$10M
Risk 2	$16M	$20M	$35M
Risk 3	$11M	$15M	$23M
Total Risk	$31M	$41M	$68M

REPRESENTATION OF UNCERTAINTY

Probability Distributions

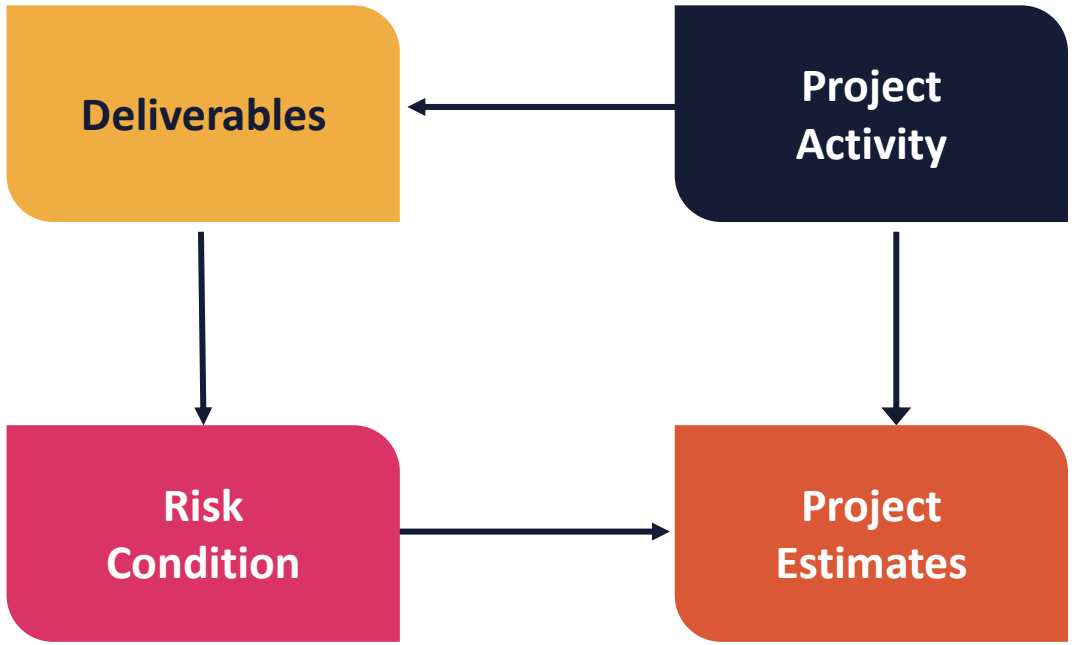
Interviewing relevant stakeholders helps determine the three-point estimates for each WBS element. In this example, the likelihood of completing the project at or below the most likely estimate of $41 million is relatively small.



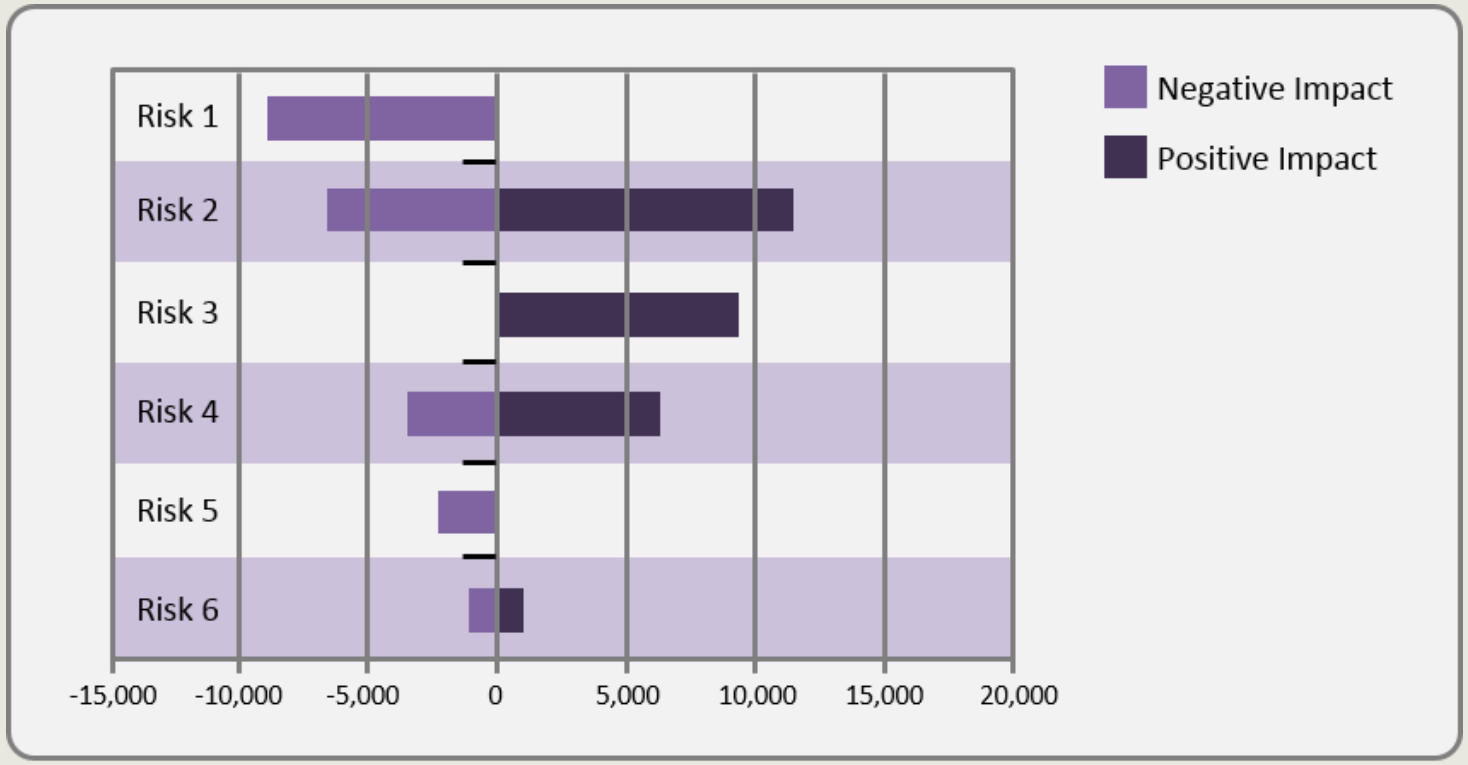
INFLUENCE DIAGRAMS

Graphical aids used to assist decision making under uncertainty

Uncertainty can be shown as a range of possibilities (probability distribution) and simulations (e.g. Monte Carlo) can be used to indicate which elements have the greatest influence on key outcomes



SENSITIVITY ANALYSIS



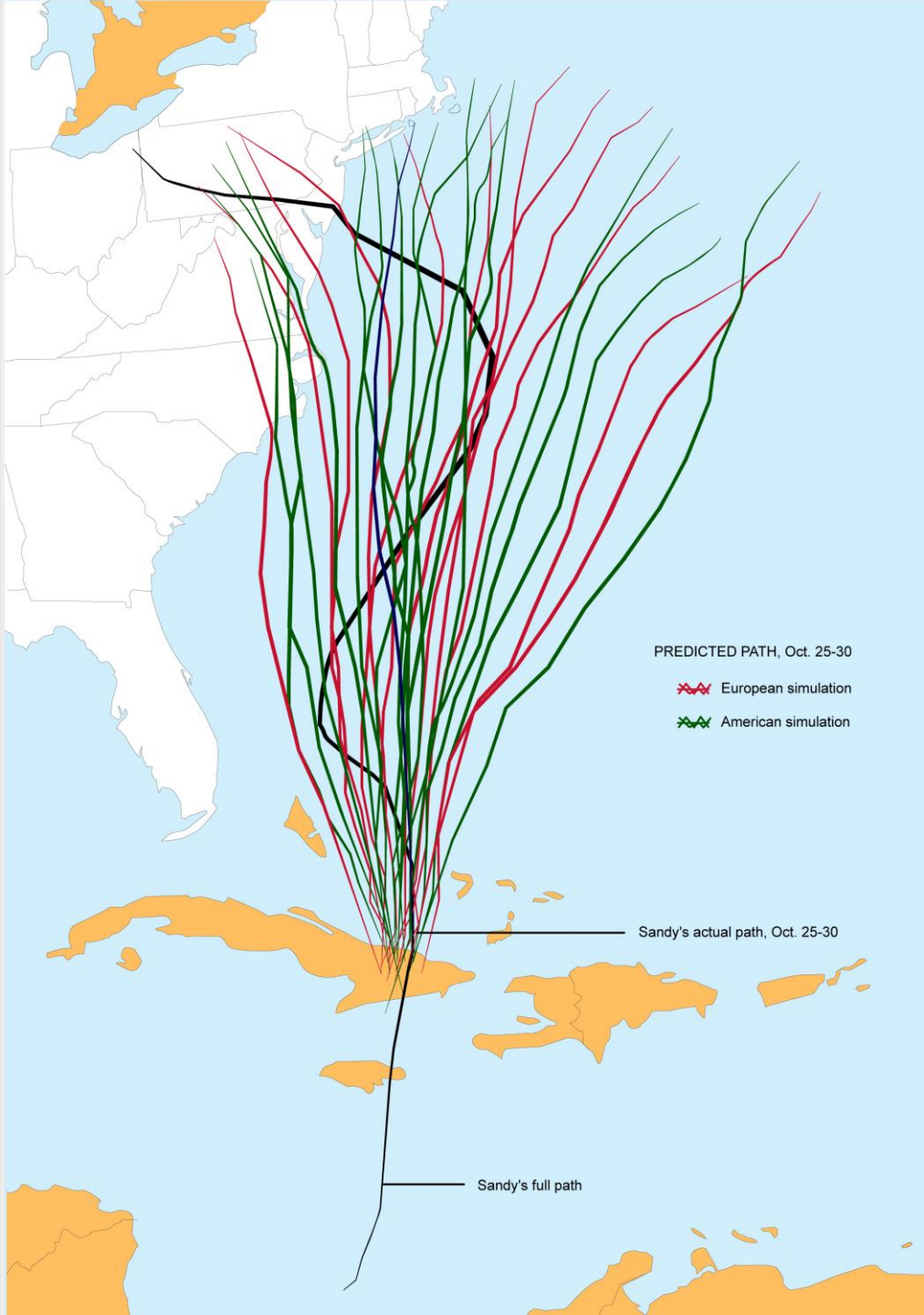
Example of Tornado Diagram

Sensitivity analysis helps to determine which risks have the most potential impact on the project.

MONTE CARLO TECHNIQUE

Probability analysis

- Run variables through a model to determine different outcomes
- Determine a range of possibilities and their probabilities
- The simulation is run several thousand times until a range of probabilities becomes clear



EXPECTED MONETARY VALUE

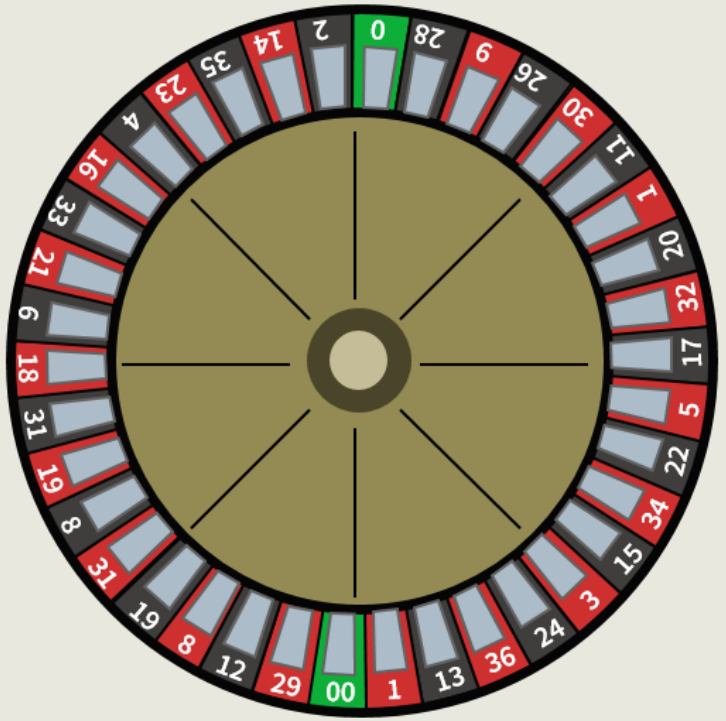
Probability * Financial impact

Roulette
38 spaces
2 green spaces, numbers 0 and 00
18 red spaces
18 black spaces

Players bet where the ball will land, and spin the wheel

EMV Formula
P = Probability
I = Impact
EMV = Win (P * I) + Lose (P * I)
EMV = (18/38 * $1) + (20/38 * - $ I)
EMV = $.47 + - $.52
EMV = -$.05

Wager = $1 on black
Probability of landing on black = 18/38
Probability of not landing on black = 20/38



EXPECTED MONETARY VALUE (EMV)

Expected Monetary Value (EMV) analysis is a statistical concept that calculates the average outcome when the future includes scenarios that may or may not happen.

Risk analysis of two choices:

Option A: We can try to be first to market with our software product.

There is an 80% chance of incurring a cost of $400,000 for rework effort and additional technical support.
There is a 30% chance of recognizing $2,000,000 in extra revenue by being first to market.

Threats = - $400,000 * .8 = - $320,000

Opportunities = $2,000,000 * .3 = $600,000

EMV = $280,000

EXPECTED MONETARY VALUE (EMV)

Expected Monetary Value (EMV) analysis is a statistical concept that calculates the average outcome when the future includes scenarios that may or may not happen.

Risk analysis of two choices:

Option B: Instead of being first to market, we can focus on the inclusion of an extra feature.

There will be a $70,000 investment. There is a 50% chance of added rework of $160,000. There is a 60% chance that inclusion of this feature will return $500,000 if we are the only vendor with this feature.

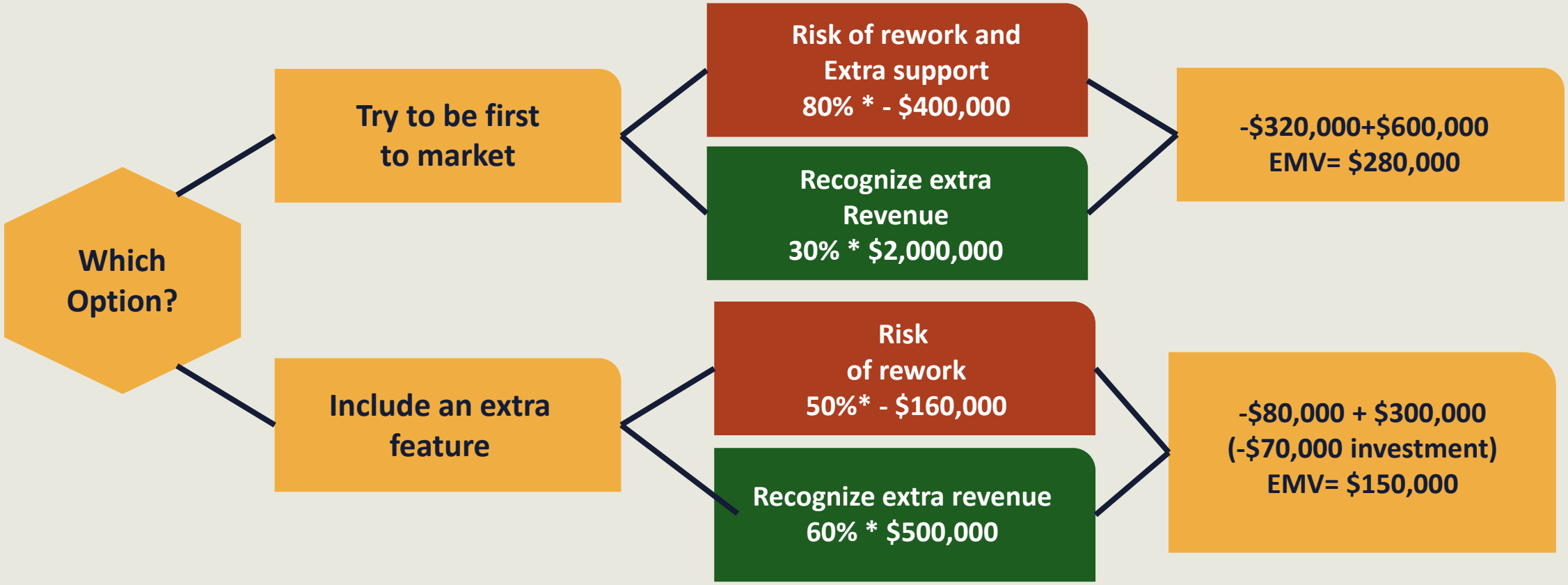
Threats = -$160,000 * .5 = - $80,000

Opportunities = $500,000 * .6 = $300,000

EMV = $150,000 (Don't forget to subtract the $70,000 investment!)

Which choice is best for us?

DECISION TREE



PROBABILITY DISTRIBUTIONS

Discrete Distribution

The data can only contain specific values

Ex: Decision Trees

Mutual Exclusivity

The outcome of one event prevents the possibility of another.

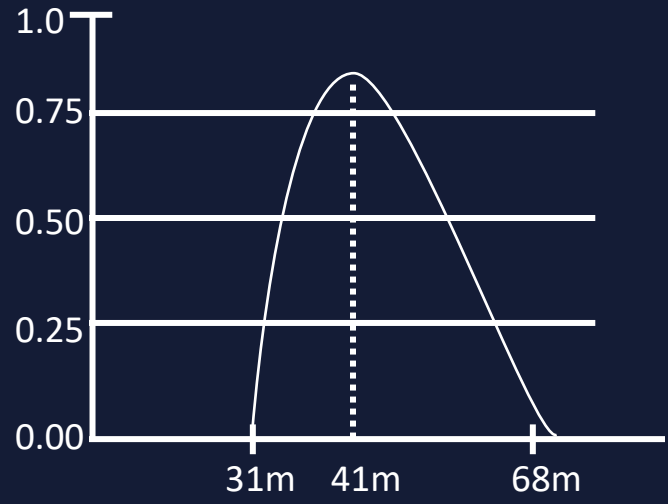
Ex. Painting a house blue prevents the possibility of any other color.

Ex. Heads on a coin toss prevents the possibility of tails on that same toss.

Continuous Distribution

The data can fall within a range of values

Ex. Three-point estimating, PERT



PLAN RISK RESPONSES: THREATS

Possible Risk Responses – Threats

Responses	Description
Escalate	**Determining that the threat is outside the scope of the project and exceeds the authority of the project manager.** Example: The project manager notifies the PMO that a cease and desist order has been received to stop project work.
Avoid	**Changing the project management** plan through integrated change control to **totally eliminate** the threat. Example: Removing a feature from the scope. Extending the schedule baseline to meet the due date.
Transfer	Shifting the impact to a third party who is responsible for the response. Usually involving **cost risk and contracts**. **Example: Purchasing insurance or a warranty.**
Mitigate	**Reducing probability and impact** so it falls within an acceptable threshold. Example: Negotiating with a backup supplier for more materials. Interviewing candidates for potential job openings before you need them. Following the weather report.
Accept	Determining not to change the course of the risk. Could be **Passive where no action is taken** or **Active which is using pre-determined contingency reserves to "accept" the risk.** Example: Putting funds into a contingency reserve to pay for the impact of the risk event.

PLAN RISK RESPONSES: OPPORTUNITIES

Possible Risk Responses - Opportunities

Responses	Description
Escalate	**Determining that the opportunity is outside the scope of the project and exceeds the authority of the project manager.** Example: The project manager notifies the PMO that a vendor has offered a volume discount to the organization.
Exploit	Changing the project management plan through integrated change control to eliminate the uncertainty and make it happen. Example: Adding a feature to the scope baseline to potentially guarantee best product on the market.
Share	Allocating some or all of the impact to a third party who is best able to capture the opportunity for the benefit of the product. Usually involving joint ventures and contracts. Example: Creating a joint venture firm to share the opportunity.
Enhance	Maximizing the probability and impact. Example: Adding more resources to an activity so that it finishes early.
Accept	Being willing to take advantage of an opportunity but not actively pursuing it. Example: Expert and experienced staff will quickly create a high-quality deliverable.

TERMS

Risk Trigger:

An event that lets you know a risk is about to occur.

Triggers can be identified before or after the risk event.

Risk Owner:

The person or party responsible for the risk response.

RISK TERMINOLOGY

Secondary Risk: creating a new risk because of response implementation
Example: Fast tracking schedule creates a new risk to the quality of the deliverable.

Residual Risk: Left over risk after a response has been implemented
Example: Providing safety training can't guarantee zero incidents

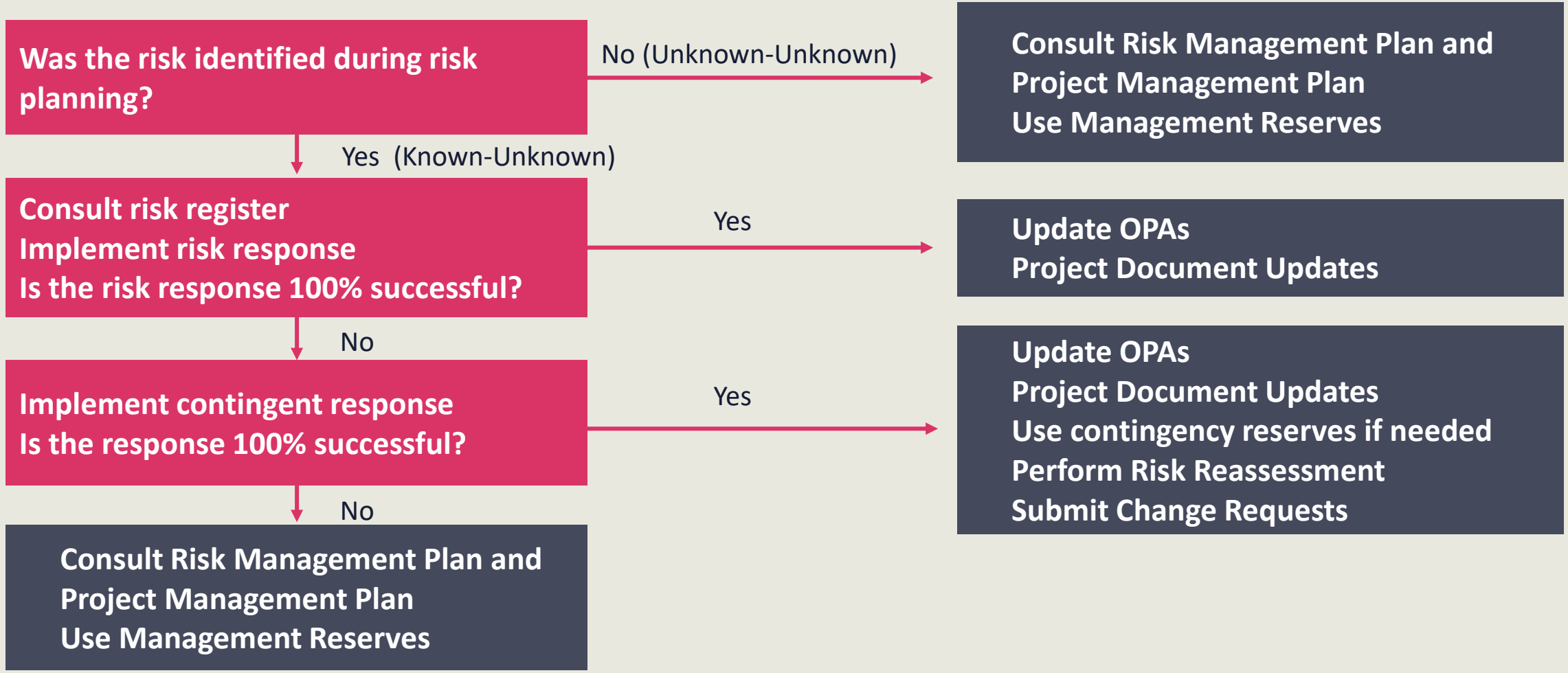
Fallback Plans: A reaction to a risk that has occurred, and the primary response was inadequate
Example: Avoided the risk by extending the schedule baseline due date but we are still behind schedule. Now we must crash activities.

IMPLEMENT RISK RESPONSES

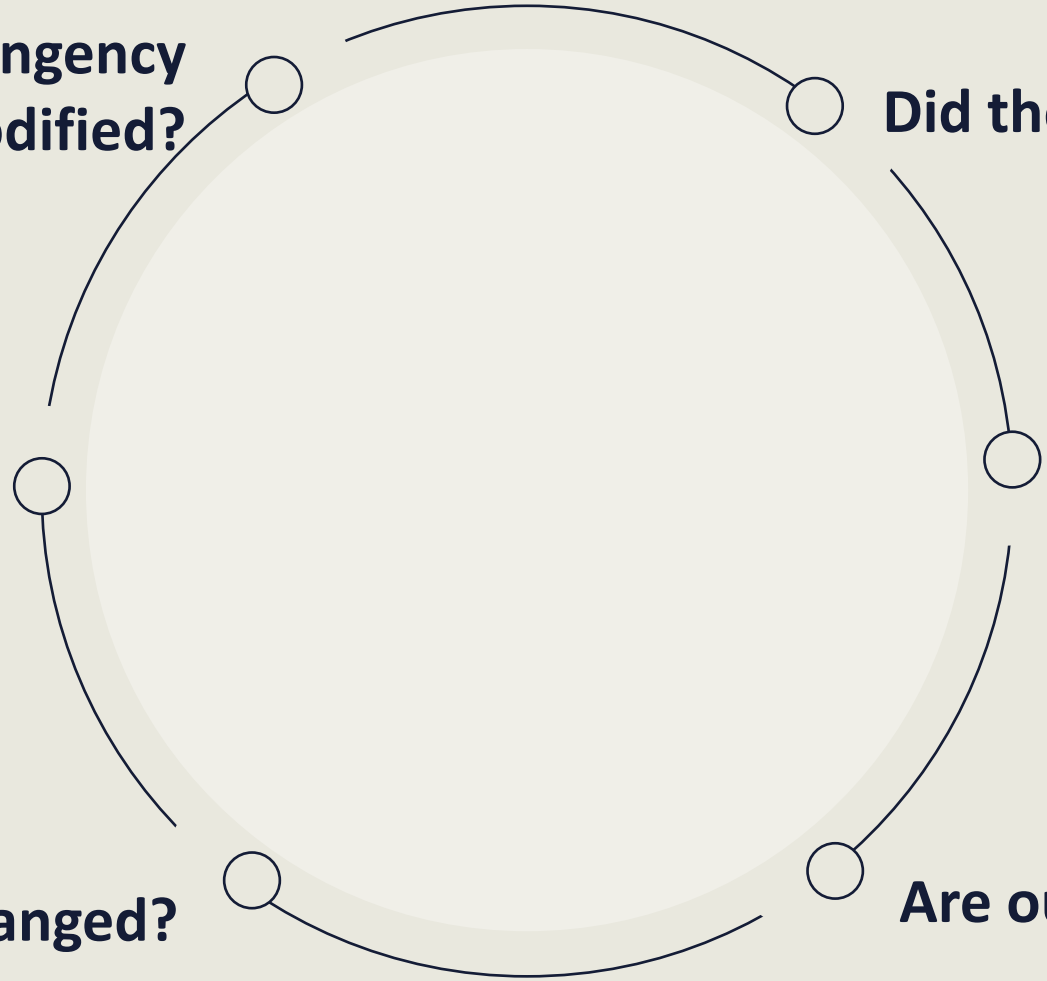
IMPLEMENT RISK RESPONSES

IMPLEMENT RISK RESPONSES – FLOW CHART

A Risk Event has Occurred



MONITORING RISKS



Do the contingency reserves need to be modified?

Did the response work?

Are the risk management policies being followed?

Are there any new risks?

Has an assessed risk changed?

Are our assumptions still valid?

MONITORING RISKS

Risk Reassessment

1. Identifying new risks
2. Reassessing current risks
3. Closing outdated risks

Iterative Process

What risks have changed?

Risk Audits

1. Documenting the effectiveness of risk responses
2. Making sure root causes have been addressed
3. PM is accountable for auditing at an appropriate frequency

How well are we handling risks?

MONITORING RISKS

Reserve analysis

How much time and money is left compared to the amount of risk?

DAILY BOOTCAMP SURVEY

Please share your thoughts.

At the end of each Bootcamp session please let us know how we are doing. Your feedback helps us to offer the best possible Bootcamp experience.

Thank you for attending Session 3!