

The Role of Clearly Communicated Requirements in Project Success

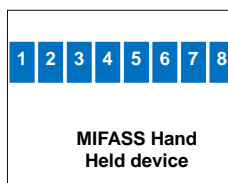
Mike Wakshull MSc, PMP, CQE

www.q9consulting.com

951-252-4929



MIFASS* was a requirements disaster from 1975 until it was canceled in 1987



Exit as 8-bits
1 bit at a time



MIFASS Mil Spec computer

The requirements were specific and could not be changed by the contractor, Norden Systems**

Exit reassembled
As an 8-bit word



3 When the IBM PC was released in August, 1981
4 It was more powerful than the MIFASS computer

*Marine Integrated Fire and Air Support System
**<http://www.dtic.mil/dtic/tr/fulltext/u2/a186221.pdf>



In 1994 the FAA canceled an upgrade to the ATC system after \$1.5 billion spent



The requirements
Were piled many
Feet high

AAS failed because of overambitious plans by both the FAA and the contractor, poor FAA oversight of contractor performance in developing software, and FAA's indecisiveness about requirements.
Office of the Inspector General
<http://www.oig.dot.gov/sites/dot/files/pdfdocs/av1998113.pdf>



A major bank stated a requirement of 98% computer up time



When asked which week they want to be down the requirement changed



The PMI definition of a requirement

Requirement – A condition or capability that is required to be present in a product, service, or result to satisfy a contract or other formally imposed specification.



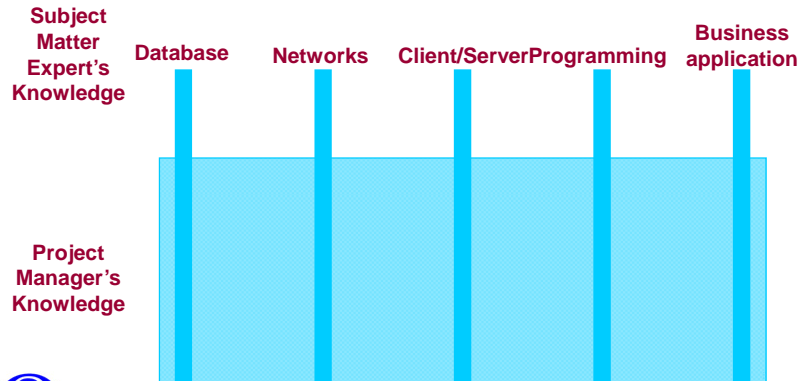
Requirements are divided into types

Business	Functional	Non-Functional
What the executives want	The way the product will behave	Non-behavioral aspects
In the project charter	In the functional requirements document	Delivery on or before a set date
In the business case document	User interface	Must have customer maintainability
New accounting system	Data entry fields	We need 99.9% up time
Print documents at a remote location	Security measures	The product must scale up for large volumes



The Project Manager is a Generalist

- Hire a good business analyst as the translator
 - Business problems into technical language
 - Technical language into business solutions



The objective is converting stated requirements into real requirements



We must plan our requirements activities

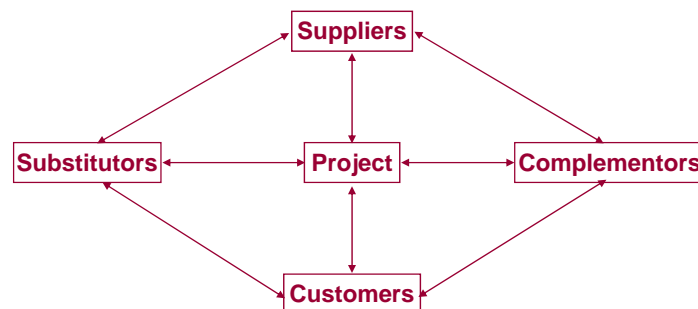
- **Use a defined process**
 - Form a core team
 - Identify the business requirements
 - Identify the functional requirements
 - Use a good life cycle model
 - Analyze the requirements
 - Discard unnecessary requirements

- **Implement excellent communication in the project**

In preparing for battle I have always found that plans are useless, but planning is indispensable.
Dwight Eisenhower



Communications Interfaces

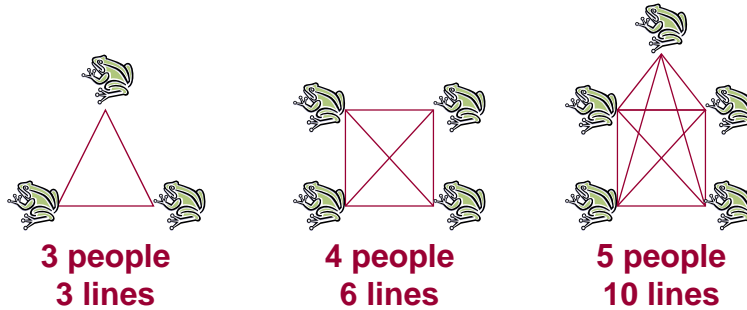


Adapted from Harvard Business Review. Brandenberger and Nalebuff. July, August 1995



Communication Channels

- The number of communications channels increases as the number of people increases



$$\text{Lines} = n*(n-1)/2$$

Source: Frederick Brooks. The Mythical Man Month. 1995.



Communicating Requirements – 23-July-2013 © Q9 Consulting, Inc. All rights reserved www.q9consulting.com

11

Results of 2010 CHAOS report shows the lifecycle model is important

Overall

37% successful
42% challenged
21% fail

By methodology

Waterfall (sequential)

14% successful
57% challenged
29% failed

Agile (iterative)

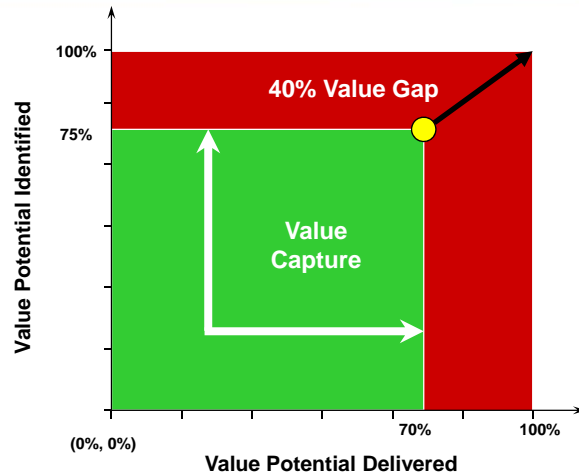
42% successful
49% challenged
9% failed



Communicating Requirements – 23-July-2013 © Q9 Consulting, Inc. All rights reserved www.q9consulting.com

12

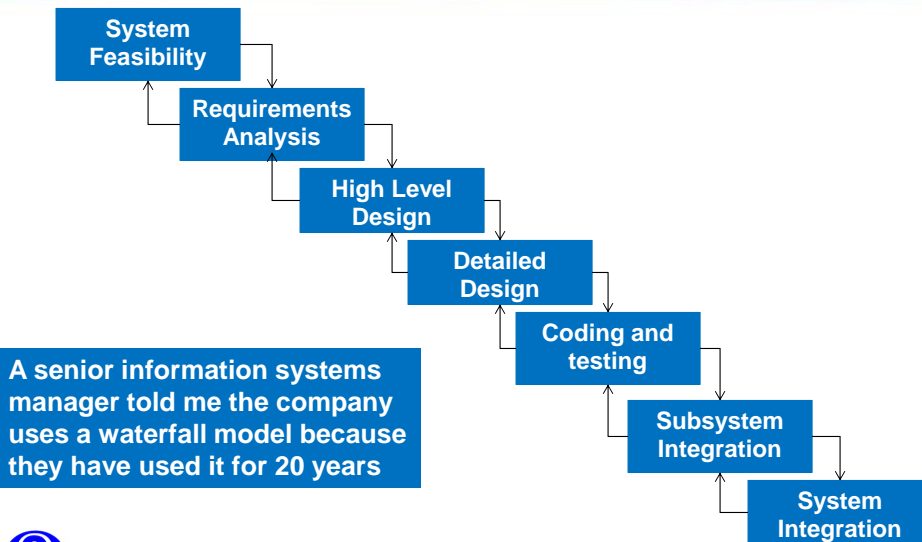
Executives are capturing only 60% of the value potential



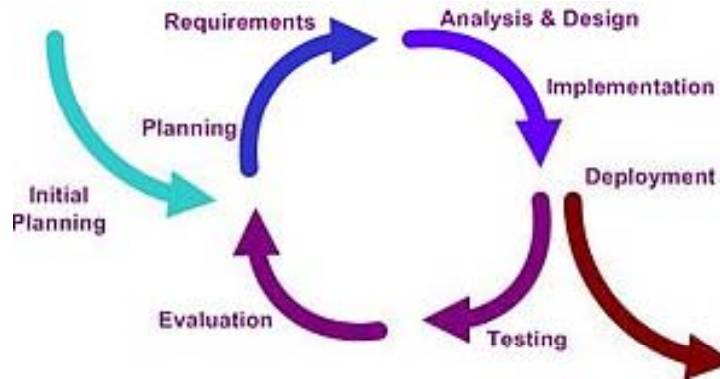
Source: SDG surveys in 2001 and 2002.



The waterfall model developed in 1971 by Winston Royce at TRW



Iterative models are based on Deming's Plan, Do, Study, Act



Originally developed by Walter Shewhart as PDCA



Projects are dynamic systems that must be properly understood



A good analyst makes many decisions and asks "Why?"



Dig deeply to learn the real requirements using a 5-why methodology



A good analyst is willing to make many decisions



The first requirements activity is forming a team of key stakeholders

Each stakeholder has an inherent bias



There are two types of bias

▪ Cognitive bias

- Occurs because people see what they want to see
- We will present several forms of cognitive bias
- Often unconscious or subconscious

▪ Motivational bias

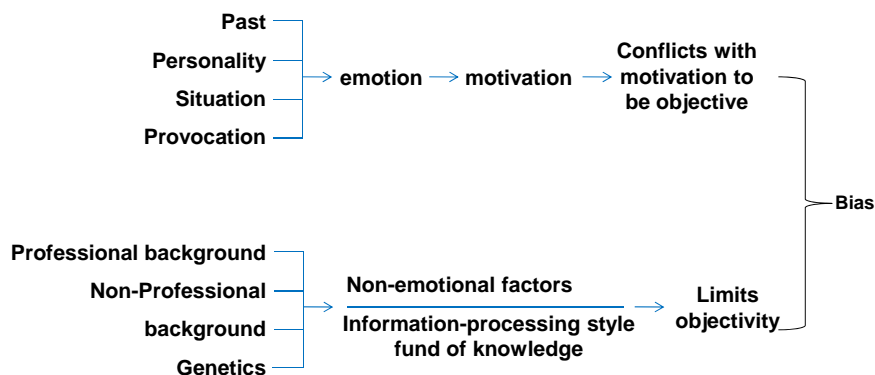
- Occurs when a decision maker or analyst has a close association with a party to the decision
- The expert witness takes the side of the hiring party rather than the side of the evidence

No testimony is sufficient to establish a miracle unless the testimony be of such a kind that its falsehood would be more miraculous than the fact it endeavors to establish.

David Hume



A framework conceptualizing the origins of bias



Source: Goldyne, A. J. 2007. Minimizing the influence of unconscious bias in evaluations: A practical guide. *Journal of American Academy of Psychiatry and Law*. 35:60-66.
Used with permission of the author



Framing a statement poorly can cause undesirable outcomes



See who is able to make rules clear and commands easy to follow, so that people listen and obey.

The Art of War



Understanding bias can help you make better decisions as a project manager

- Analysis seeks to produce reliable evidence then clearly and unequivocally report the evidence
- As experts we need to recognize when our biases and bias of others influence our decisions
- *We all have biases*

Bias:
 “A predisposition to decide a cause or an issue in a certain way.”
 Black’s Law Dictionary



How are biases expressed?

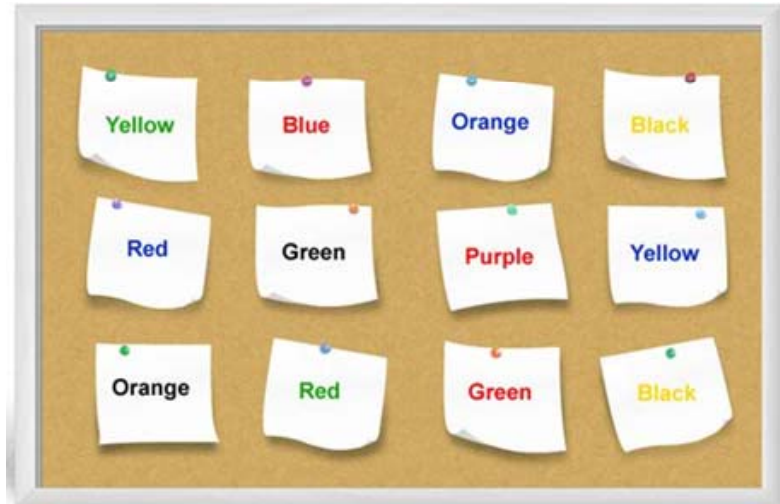
- **Some biases are conscious**
 - We know we have beliefs based on learned knowledge
 - Conscious biases may be based on experience
- **Other biases are at an unconscious level**
 - We are not aware of these
 - They can ruin us if we attempt to justify them

An expert is someone who knows some of the worst mistakes that can be made in his subject, and how to avoid them.

Werner Heisenberg



Exercise 1 - In 20 seconds identify the font color of the text for each label



The way a proposition is *framed* biases the resulting decision

- **Framing** is the way a problem is stated
- **When a frame predicts an imminent loss, a person is**
 - Likely to take action
 - More likely to accept an uncertain choice with the chance of a smaller loss
- **People will accept a sure gain rather than an uncertain opportunity with a larger return**
 - They equate a loss with acknowledgement of an error
- **Old decisions are framed with new information**
 - With hindsight, good decisions can be considered bad



Exercise 2A Framing

- **Your project needs a new part for a piece of machinery**
 - The local dealer quotes a price of \$500
 - Thirty minutes away the part can be purchased for \$450
 - Will you drive to the other dealer to save the \$50?



Exercise 2B Framing

- **Your project needs a new part for a piece of machinery**
 - The local dealer quotes a price of \$100
 - Thirty minutes away the part can be purchased for \$50
 - Will you drive to the other dealer to save the \$50?



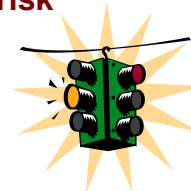
The *availability heuristic* is the ability of a person to recall past events

- People's decisions are biased by weighting low probability but high impact events more heavily
- Belief in a positive relation between events causes a person to find additional confirmation
 - Even when the relationship is illusory
 - Familiarity may cause oversight of unusual events
- People are subject to this bias when
 - Decisions are approached serially
 - They assume readily available information is best
- Overcome the bias by adding people and broadening the scope



Qualitative Risk Analysis

- Unable to assign
 - A true probability of occurrence
 - Actual cost or schedule impact to the project
- Use subjective terms to define the risk
 - High, medium, Low
 - Red, yellow, green



An example of 2 equally skilled document examiners*

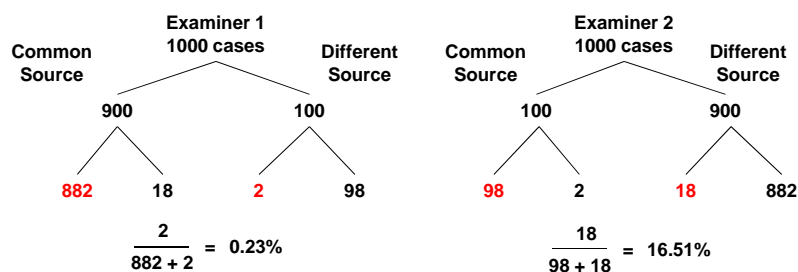
- Each has a false positive and false negative rate of 2% - Assume 1000 cases per examiner
- Examiner 1 has 100 cases with a common source of known and questioned
- Examiner 2 has 900 cases with a common source of known and questioned
- How often is the examiner wrong when a match is called?

*modeled after an example in
 Koehler, J. (2008). Fingerprint error rates and proficiency tests: What they are and why they matter.
 Hastings Law Journal. 59: 1077-1100.



The solution to the error rate problem

State of Nature		
Examiner's judgment	Common source	Different source
Identify	(A) True positive 98%	(B) False positive 2%
Exclude	(C) False negative 2%	(D) True negative 98%



Define Subjective Terms

- **People interpret words differently**
 - Depends upon subjective bias



Exercise 3 - Subjective Valuation

For each of the following statements please state how you interpret the statement as a probability of occurrence. Substitute the respective word into the phrase. Rate the completed phrase as a probability of occurrence.

The risk has a _____ chance of occurring.

Please mark the box that represents your interpretation.

Example: If you interpret “This risk has a *likely* chance of occurring.” as 75% place a mark into the 71%-80% box.

	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91- 100
good										
high										
medium										
possible										
low										




The *confirmation bias* is deadly

- **People seek information to support their own hypothesis**
- **People reject data that refutes their hypotheses**
 - Evidence of an incorrect approach is viewed as failure
 - The result is failure to realize new opportunities
- **Fear of being wrong leads experts to continue with opinions that are no longer valid**
 - They seek to confirm the original decision
 - They seek data that confirms a reason to continue


A man hears what he wants to hear and disregards the rest
Simon & Garfunkel, *The Boxer*





Framing a statement poorly can cause undesirable outcomes



If you execute project "A" you will lose \$100,000



If you execute project "B" there is a 60% chance you will lose \$200,000 and a 40% chance you will lose nothing

See who is able to make rules clear and commands easy to follow, so that people listen and obey

The Art of War



Anchoring: Stating a reference point and measuring the results against the point

- **Future options are biased by an anchor**

- Change the anchor to change the results



We need 30 sales this month

We closed 29 loss leaders, keep looking



We need 30 sales of our new profitable product this month

We made our sales and created value for patients, staff and stockholders



The *confirmation bias* – seek information to support one's own hypothesis

- **There is a tendency for managers to hire in their own image**
 - Brain scans show that familiarity enhances self image
 - Managers often fail to look for contradictory information
- **Managers reject data that refutes their hypotheses**
 - Evidence of an incorrect approach is viewed as failure
 - The result is failure to realize new opportunities
- **Fear of being wrong leads management to continue with projects that are no longer valid**
 - They seek to confirm the original decision
 - They seek data that confirms a reason to continue



Delusions of success exaggerate benefits and discount costs of initiatives

- **People tend to exaggerate their own talents**
 - They believe they are above average in positive traits and abilities
 - They fail to consider adversities in planning scenarios
- **More than 80% of start-ups fail to achieve their target market share**
 - Initial plans accentuate the positive
 - The manager anchors to the plan and ignores risks

You think “I’ve got a good story department, I’ve got a good marketing department, we’re going to go out and do this.” And you don’t think that everybody else is thinking the same way.

Joe Roth, Walt Disney Studios



Obtain an outside view to reduce the sources of over-optimism

- **The outside view looks at the way others consider the situation**
- **The inside view is often subject to biases such as**
 - Anchoring to schedules and budgets
 - Availability of data
 - Endowment
- **The outside view ignores the current situation**
 - To develop a forecast it is more accurate to evaluate a situation relative to a reference class
 - The outside view treats a project as not completely unique



Completing requirements without considering risk

Is like putting the horse before the cart



A man hears what he wants to hear and disregards the rest
Simon & Garfunkle – The Boxer



Probability-Impact Matrix

- Assign a relative value
 - To probability and impact
 - Multiply the values to obtain a risk weight
- Define each risk according to the ordinal scale

						Relative Risk weights	
Probability	V. High	9	9	18	36	72	146
	High	7	7	14	28	56	112
	Med	5	5	10	20	40	80
	Low	3	3	6	12	24	48
	V. Low	1	1	2	4	8	16
Relative scores		1	2	4	8	16	
		V. Low	Low	Med	High	V. High	
		Impact					



Test the requirements using inspections rather than reviews

- **Developed at IBM – Released in 1976**
- **Known as the “Fagan Inspection Process”**
 - A formal process
 - Use a team of 4 with defined roles
- **Find defects before they are created**
 - All documents are read ahead of the meeting
 - Ensure consistency
 - Look for what is missing
 - Determine clarity of requirements



Develop prototypes to test the requirements



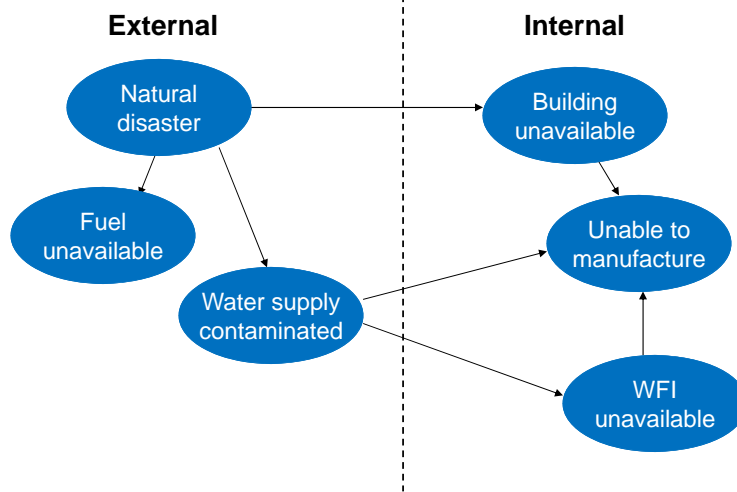
Evolutionary development turns the prototype into the product



Business and development must ensure the requirements are unified



We need to understand how system variables influence each other



Proper communication of requirements leads to project success

- In 2006 I was assigned a data quality and profiling project
- The cost estimate was \$3.2 - \$3.5 million
- ROI was 18 months
- 2 previous project managers failed
- A team of key stakeholders was assembled
- We succeeded where the others failed
- The difference was including the business stakeholders to define the requirements

