

Critical Thinking

We will look at the problem-solving process first, and then the politics of defending and advancing ideas. Finally, in this section we will look at the ways ideas are sold and how they can be suppressed.

Problem Solving

This is an area that is a central part of any engineer's job. All projects start with an idea and the challenges of implementing that idea. Many of those challenges will be known upfront, and many won't. Often engineering is a recursive process. You set target(s) and then see how close the first iteration comes to the desired goal. This is known as accuracy. But there is a second statistical parameter that comes into play; Precision.

Precision is the degree to which repeated measurements under unchanged conditions show the same result. Think of a target on a shooting range. How close you come to the bullseye is your accuracy. The tighter the grouping of holes in the target, the higher your precision. So many holes in proximity at the extreme edge of the target means you have high precision, but low accuracy. The aim is always to have a tight cluster of holes near the center of the target, High accuracy, and precision.

If you design a project/product that requires much adjustment and tweaking in final assembling and testing it might mean the precision of the design is low. If the product coming off the assembly line missing the products stated specs, but all miss it in precisely the same way, the design was inaccurate to the desire specs.

The design goal is to get to the precision and accuracy goals as early in a design as possible. How is that done? By exercising many problem-solving sessions.

Open-mindedness

How you approach problem solving can be broken down into several steps. The first is to enter the process with as much open-mindedness as possible. We all come with our biases and beliefs, so it is important that your analytical instincts are allowed to flourish. After all being analytical is what drawn you into the engineering realm in the first place. This includes embracing different cultural perspectives. Not just nationalities or race, or gender. But the various cultures that are often found in the same company or organization.

You must strive to be fair to all involved and their ideas. It's imperative to stay as humble as possible. While you might be the smartest person in the room occasionally, it's safe to assume that usually that won't be the case.

Be Inclusive. Sometimes a fresh approach to a challenge is from someone not steeped in the same orthodoxy you're in. The authors have seen situations where we think we know what doesn't work, but situations have changed, such as new technology and someone who doesn't know what used to not work, suggests a second look. Be objective, and observant. Force some

time for reflection. In addition to applying any applicable standards and paying attention to details while at the same time any clarification of any ambiguous details. Humans evolved to instinctively look for patterns. As new facts are arrived at evaluation of what is already known considering new information should be ongoing. Remember this is an iterative process. The best chance for these guidelines to be followed is through collaboration within the entire team.

The Decision-making process

- 1) The actual decision-making process starts with defining the problem.
- 2) A needs list should be identified. At this stage there should be at least as much listening to others as suggestions put forth by yourself.
- 3) Generate an array of possible solutions or responses thru:
 - a) fact finding and data gathering
Ask thoughtful questions
 - b) data analysis and historical analysis
 - c) brainstorming and creative thinking, which should be done by:
 - i) Using Cognitive flexibility and Conceptualization
 - ii) Curiosity and Imagination
 - iii) Predicting outcomes of the various possible solutions
 - iv) Synthesizing – Investigating how to combine parts of a whole in new ways
Making abstract connections and inferences
Recognizing differences and similarities
 - v) Listening to anyone with visionary ideas or approaches
 - vi) Interpretation of the information gathered
- 4) The list should be prioritized
- 5) Evaluate the costs/benefits of each thru:
 - a) Causal analysis – identify and analyze what is needed to implement the possible solutions
 - b) Risk assessment – This goes hand in hand with the previous step
 - i) Identify potential risks by forecasting and prediction
Review the project process through analysis to see where risks can be minimized
 - ii) Categorize risks
 - a) Project Costs
 - b) Project Schedule
 - c) Project Performance and implementation
 - d) Organization Risks
 - i) Company reputation
 - ii) Product manufacturing
 - iii) Legal
 - iv) External – Natural disasters, vandalism, sabotage, terrorism, labor and civil unrest
 - iii) Qualify risks
 - a) Impact if the risk occurs (low/medium/high)
 - b) Probability of the risk occurring (low/medium/high)

Is the team comfortable with project cost projects and timelines?
If not, the risk probability will be higher

- iv) Developing responses to the various risks
 - v) Discussion – lots of it
 - vi) Document the entire risk horizon
 - vii) Repeat as necessary
- 6) Questioning and validating the gathered evidence
Apply a level of skepticism in filtering out the path forward
- 7) Select a solution or response
- a) Collaboration by all involved with solving the problem
 - b) Mediation of disputes
Compromise should often be avoided
“A compromise is an agreement where all parties get what neither of them wanted.”
Remember the camel is a horse designed by a committee joke
Often it is the person(s) with conviction in an idea that will make a solution work
That said, make sure you know their motivation in their approach
 - c) Development a test procedure to measure the performance of the fix
- 8) Implement the option chosen – through project management, and time management
- 9) Continually assess the impact of the decision chosen and modify the course of action as needed, follow-through

The Politics (the non-government kind)

The truth is not hard to kill. A lie well told is immortal. Mark Twain

No one means all he says, and yet very few say all they mean, for words are slippery and thought is viscous. Henry Adams.

As we have already mentioned a couple times, it is politics, many times more than technology and engineering that shapes projects. People will argue for their cause or point of view. Francis Bacon put forth his four “idols”.

Francis Bacon an English philosopher and statesman in 1620 classified the four leading intellectual fallacies of his time, which he called idols. The term idol represented an image or belief that mislead the mind’s thought process. The first was Idols of the Tribe. These are misconceptions rooted in human nature. Idols of the Cave are deceptive beliefs rooted in the individual.

The third, Idols of the Marketplace is often in the forefront today, as this refers to words used incorrectly, semantically, to convey ideas. Using deceptive verbiage to convey thoughts. These are errors in thinking that come from a misunderstanding of words and language in communications between people. This idol refers directly back to rule number 1 above. An example: “This project is so important that we must have it done in three months.” What they

really meant was, “This work is so unimportant that we don’t want to fund it beyond that time.” The fourth, Idols of the Theater is another often invoked meme today. This is where false belief structures are built upon false knowledge foundations. You find debates regarding this Idol in the fields of science, philosophy, and religion. These are errors in thinking that come from a blind acceptance and unquestioned acceptance of attitudes and ideas.

Bacon claimed that the dogma that gains momentum and is backed by persons or groups exalted by others had created lines of reason and vernacular worthy of the stage. People believe what they want to believe because they are not generally good listeners. They hear selectively. They only hear what they want to hear. That is because they tend to project their own biases or experiences on situations as they often get personally involved in analysis of an issue and tend to let their feelings overcome a sense of objectivity. In addition, they tend to generalize about a specific event.

We will now get farther in the weeds as to how those perceptions are manifest in conversations or arguments.

Why do arguments occur?

- 1) Because of valid differences
- 2) For someone to get attention
- 3) To show off or impress others
- 4) To compensate for weaknesses or frustrations
- 5) To simply try to secure one-upmanship over another person
- 6) To try and impose their will or ideas over others,
- 7) Simply hostility.

Except for the first it is often the actual act of arguing that is important and not any resolution.

Things that should be answered when an argument is entered:

- 1) Exactly what is the issue at hand; exactly what are we arguing about?
- 2) What types of resolution are we seeking (how can we each get satisfaction)?
- 3) What are the facts;
 - a) to what extent to we agree:
 - i) the facts themselves
 - ii) interpretation of the facts
 - iii) attitude towards the facts
 - b) Finally, to what extent to we disagree:
 - i) The facts themselves
 - ii) disagreement based on our separate opinions
 - iii) are we confusing fact with opinion, speculation, or projection?

Logical Arguments and Fallacies

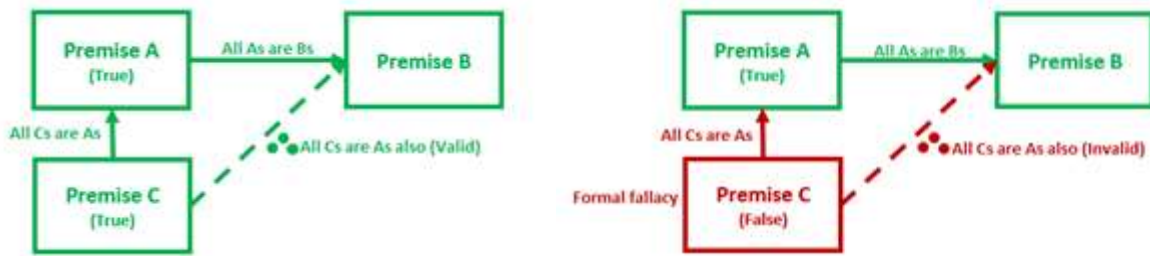
When an argument is unsuccessful it has probably gone wrong in one of the following areas:

- 1) The evidence has not been thorough
- 2) Contradictory evidence has been overlooked or ignored.
- 3) The evidence has not been accurate; false or unsubstantiated or misleading statements have been claimed as fact.
- 4) The conclusion has not been clearly and incontrovertibly come from the evidence; the relationship between evidence and conclusion has not been a firm one.

To be a sound argument the premises must be true, and the conclusion must logically follow from these premises.

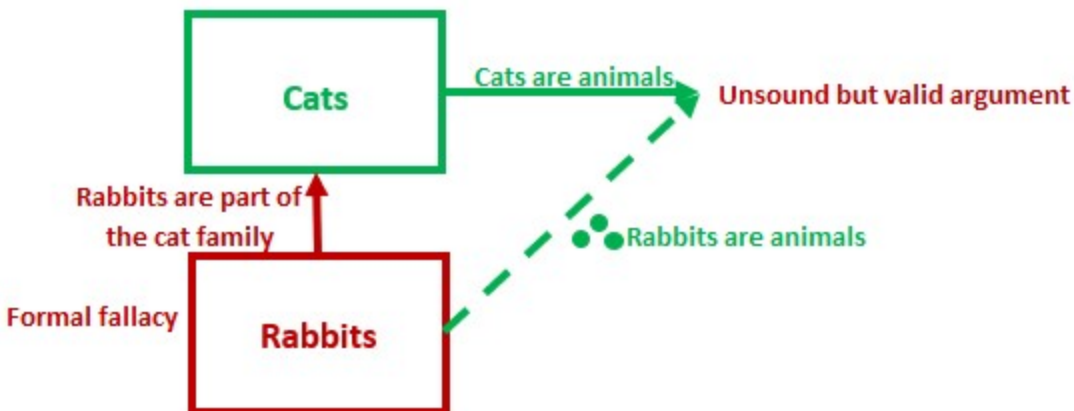
Premise true; conclusion logically derived:
 All A are B, C is an A; therefore C is also a B

This argument is sound and valid.



If a premise is false but conclusion is correct from the premises, then the argument is unsound but valid.

Rabbits are part of the cat family. Cats are animals. Therefore, rabbits are animals.



Rabbits are indeed animals, but they are not cats.

If the premises are true but the conclusion doesn't logically follow, then the argument is both unsound and invalid.

Lions are part of the cat family. Cats make good pets. Therefore, Lions make good pets.

If the second premise is false, then the conclusion that follows is invalid.
Lions are part of the cat family. Cats live in the ocean. Therefore, Lions live in the ocean.

If at least one of the arguments is false, but the conclusion happens to be true the argument is still unsound and invalid.

We made a video display totally out of seaweed. It works very well.
The display may work very well, but it definitely wasn't made of seaweed.

When anything goes wrong in the reasoning process, we have a fallacy. A fallacy usually applies to conclusions that appear sound and that are often convincing but are, in fact, incorrect.

The last project you worked on was a failure. Therefore, the project you're on now will fail.



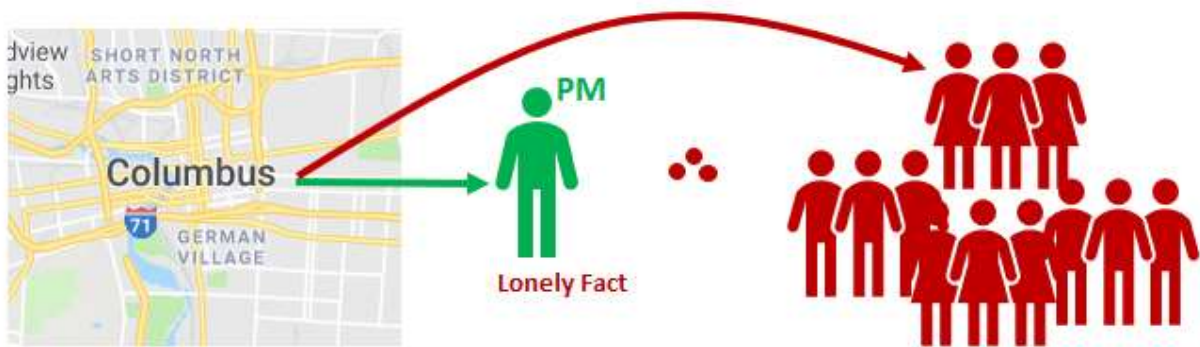
A formal fallacy is where something is wrong with the form of the argument, wrong premises etc.

That computer is lighter than air. Therefore, that computer weighs nothing.



An informal fallacy is errors in reasoning where the stated premises fail to support their proposed conclusion.

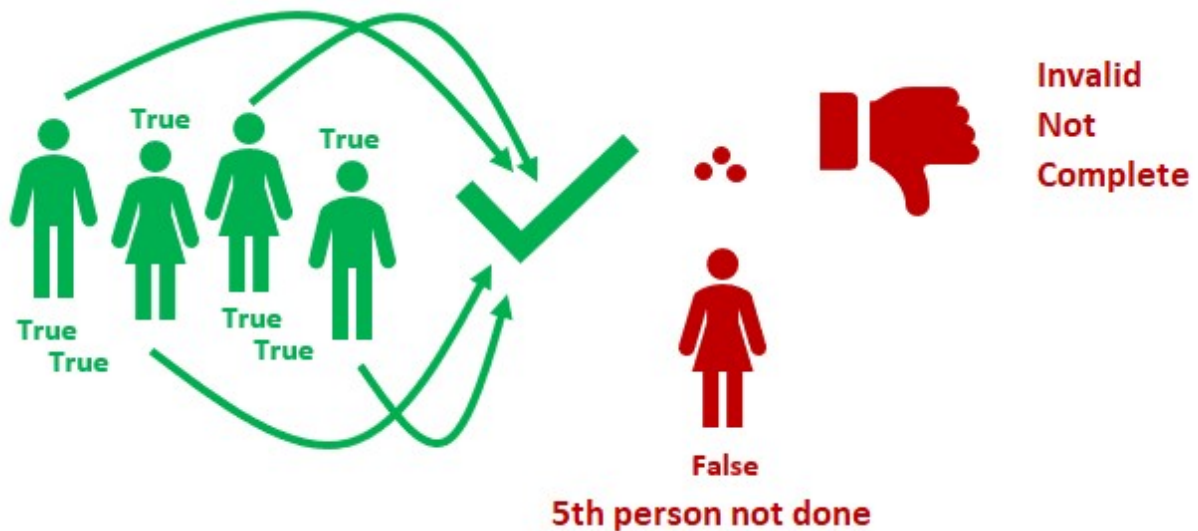
Our PM is Fred. He is from Columbus. Therefore, all PMs must be from Columbus.



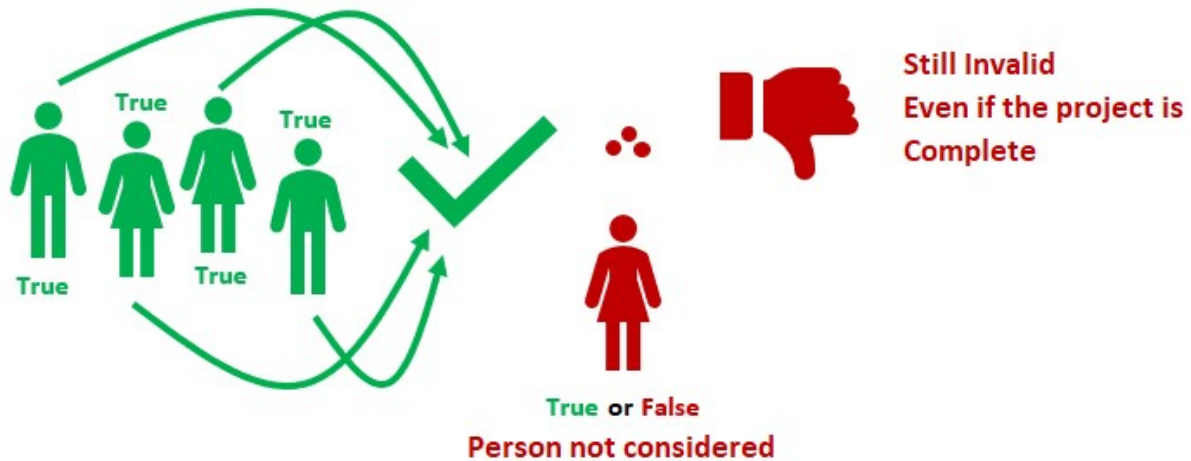
This is also known as the fallacy of the lonely fact.

Closely related is the fallacy of the hasty generalization.

Of the five people on the project, I know Fred, Carol, Bill, Sherry finished their assigned tasks, therefore the whole project must be completed.



If the conclusion does indeed logically follow from the premise, the argument is valid; if the conclusion does not logically follow from the premises, the argument is invalid. Note that the words valid and invalid apply to conclusions of arguments, not premises. When we refer to premises, we describe them as being true or untrue.

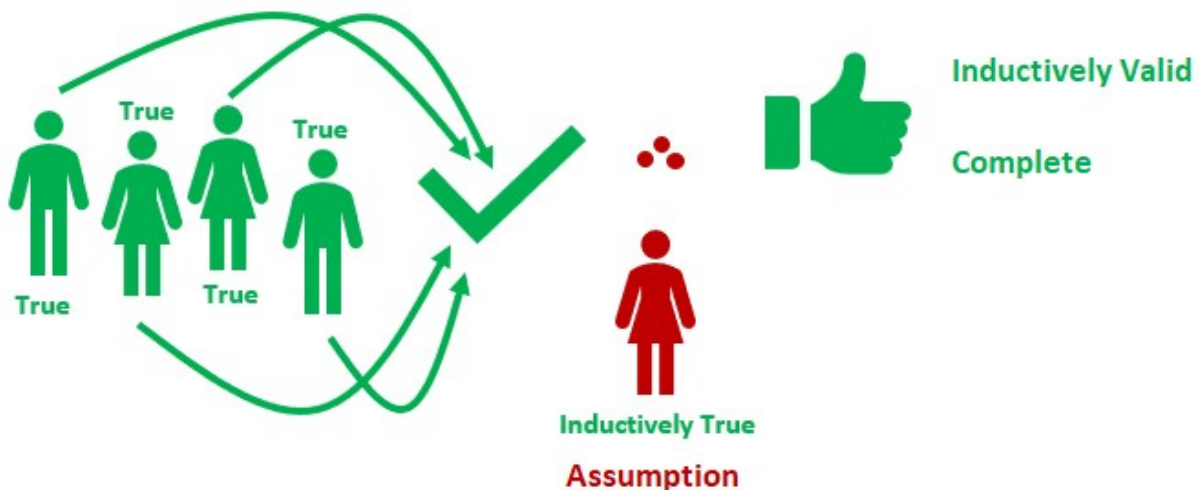


If indeed the four have completed their tasks the premises are true, but the argument is invalid, even if the conclusion is true, it is invalid because the argument didn't consider whether all had finished their tasks.

Deduction vs. Induction Premises

- A. **Deductive** Form: The premises are intended to provide *conclusive* reasons or proof of the conclusion.
- B. **Inductive** Form: The premises are intended to provide *compelling* but not conclusive reasons for the conclusion.

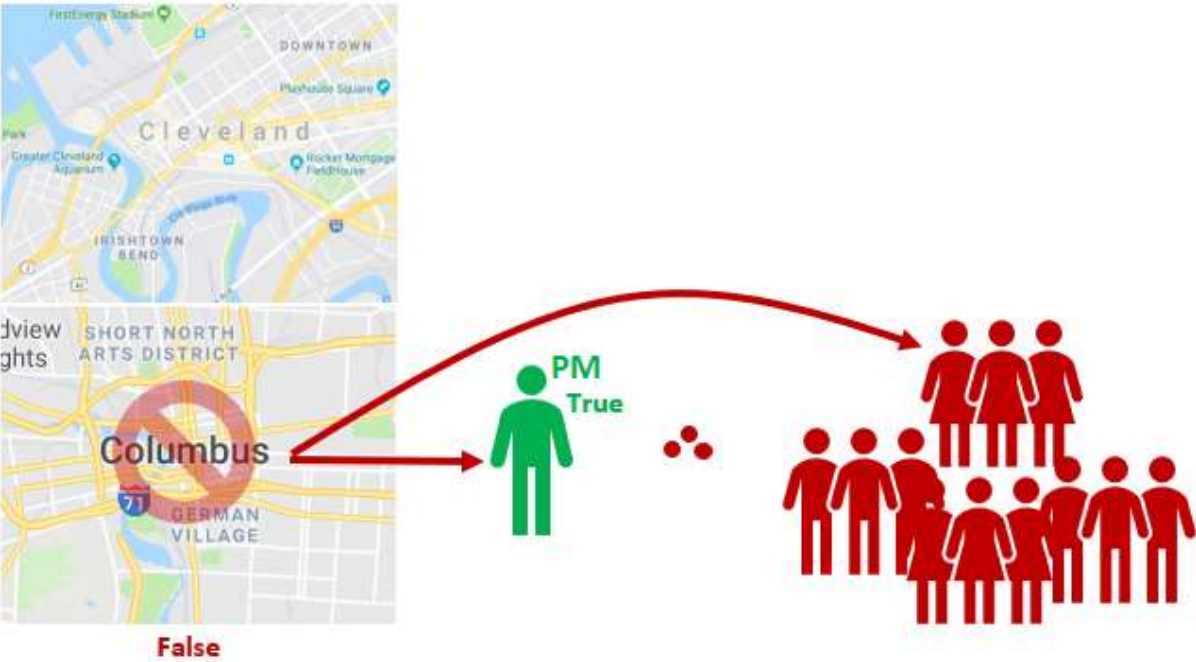
Of everyone on the project I know Fred, Carol, Bill, Sherry finished their assigned tasks, I think that only leaves Mary, and I'm quite certain she must be done; therefore, the whole project must be completed.



If Mary always got her task done before the others, but that fact wasn't confirmed, then that would be an inductive premise.

Our PM is Fred. He says he is from Columbus. Therefore, all PMs must be from Columbus.

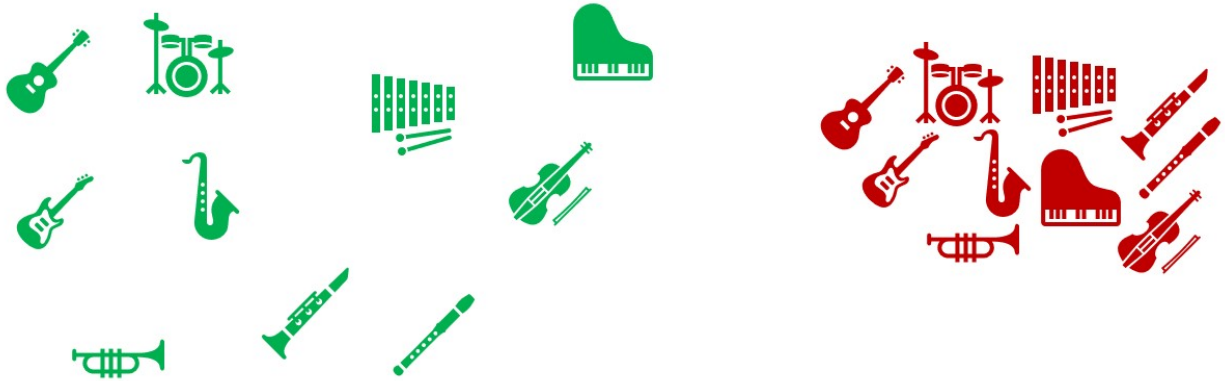
If Fred is indeed the PM and from Columbus the premises are true, but the argument is invalid.



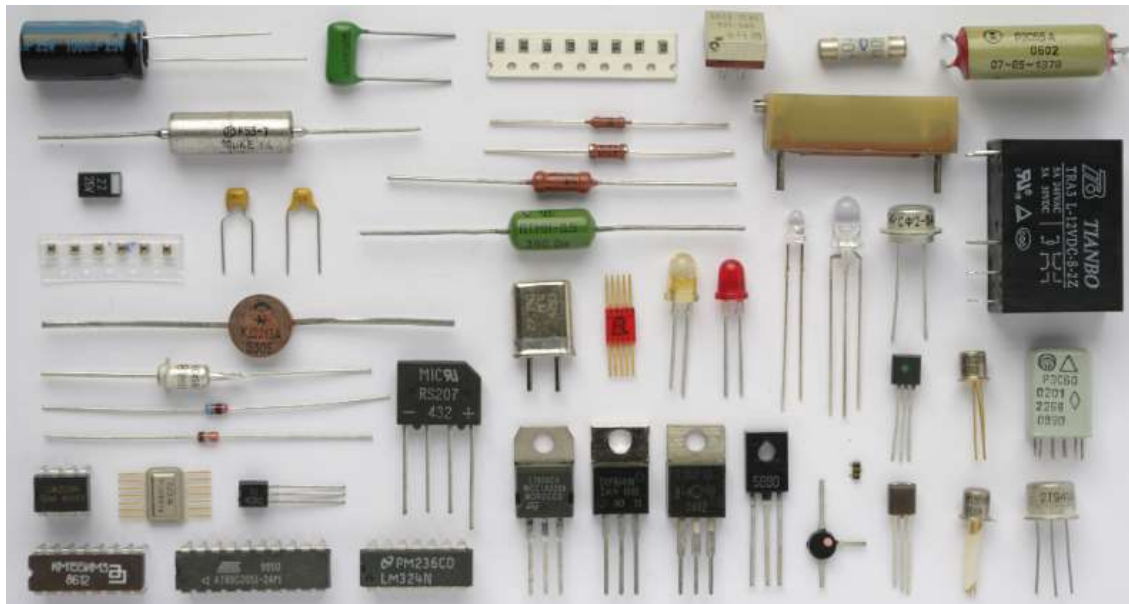
But if Fred is really from Cleveland and not Columbus than the argument is still invalid, and the one premise is false.

Other Common Fallacies

Fallacy of composition - the properties of the parts are not always true of the whole. Individual members of an orchestra might all be good, but they don't play well together.



This is a fallacy that should be near to engineers' hearts. The fact that you have specified only the best parts, how you designed them into a system can result in a product or system that doesn't work very well.

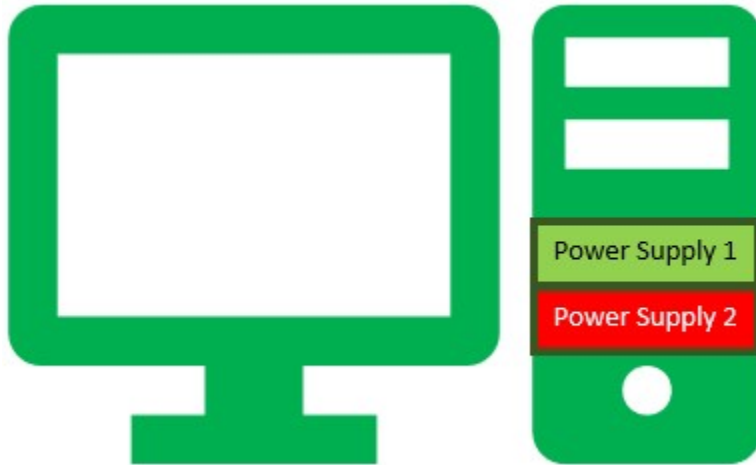


The best of these can still result in

Help!



Fallacy of division - opposite of composition - because the whole works well doesn't mean each part is good.



The unit is working well even with a power supply down. Thankfully the unit has a backup power supply.

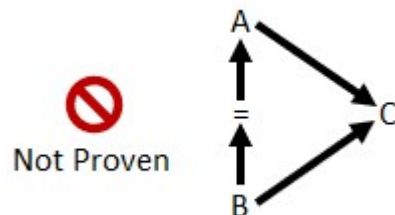
Fallacy of improper distribution or addition - Assumes that time can be accumulated linearly.



The PM claims that one 6-hour meeting, instead of four 90-minute ones is just as good. Ignores the law of diminishing returns - that 6 hour meeting is 6 hours no matter how it is distributed. Looking at the area under the meeting length versus accomplishment, which choice appears to have the most area under the curve?

Definition because of common characteristics.

All engineers (A) distrust salespeople (C). Harriet (B) distrusts salespeople (C). Therefore, Harriet (B) is an engineer (A). This argument is also wrong in that as we saw earlier it very well is most likely a hasty generalization, and it is also pigeonholing all engineers into the same opinion.



Fallacy of compromise, or the false mean - A desirable solution does not always lie in a compromise. Often doing something by half is not much better than not doing it at all.

George thinks we need to start over in the design of the display using newer technology. Pat thinks it is fine as it is. Anyone know how we can use some of both?

This approach will often lead to the Fallacy of Composition, which we just discussed. While the building blocks from an older approach and some from a newer approach may work well apart, they have a likely result of not interfacing well together.

These next two are calls for no action. Fallacy of reversion - why fix something as it will only fall into disrepair again at some time, and the Fallacy of time - the excuse that no action is needed because time heals all wounds.

Fallacy of the worse evil, or the resort to Pollyanna - Pollyanna is a novel where the heroine is excessively optimistic and a naïve creature who could suffer no ill without finding some good in it. While we say it is always good to keep a hopeful attitude. There are times that in order to get around a problem its true nature needs to be confronted.

Related to the previous fallacy is the Fallacy of idealism - This is usually a type of glibness used by those whose experience is limited and often by those who have been sheltered. It is well-intentioned but hopelessly impractical. If we can eliminate all bad causes only good effects will occur. People and events are seen as they should or are hoped to be, not how they really are.

Finally, this third one is related to the previous two, the Fallacy of Determination - Where's there's a will there's a way. You can do whatever you really want to do.

Argumentum ad quietem (Fallacy of tacit agreement) - If there is no vocal opposition then all must agree. This one can often become a big trap. Often silence is caused by shyness, being afraid for being made a fool, intimidation, authority presence, frustration from earlier attempts, or temporally awed by previous arguments and not sure how to answer those arguments, not having sufficient facts to justify their beliefs, or they are unwilling to call attention to themselves. Like the Abilene paradox. In addition, some cultures will answer in the affirmative to a statement you make only as a sign that they heard you, not that they agree with your statement.

This is also referred to as to not "rock the boat." The common analogy is a group perplexed that they together decided to take a trip that none of them wanted, but assumed everyone else did.

This differs from "groupthink" where a group of peoples' desire for harmony or conformity in the group results in an irrational or dysfunctional decision-making outcome. Cohesiveness, or the desire for cohesiveness, in a group may produce a tendency among its members to agree at all costs. This causes the group to minimize conflict and reach a consensus decision without critical evaluation.

Correlation and Causation

My team gets more done when the sun is in the east than the west!

What's being said here is that the team works better in the morning. One might hear that statement and conclude that the morning itself causes the increased productivity. This would be applying causation to the time of day. Causation, or causality, is the ability of one variable to influence another. But there is another explanation for the increased productivity in the morning. The team should be more rested after a night's sleep. So which variable is simply a correlation, that is a coincidence, and which one is the cause?

One could argue that due to the sunlight's doppler effect, that is the sun is generally getting closer until about noon (depending on where you are in your time zone) and then traveling farther away in the afternoon, that this extremely small shift in the light spectrum's frequency is what makes mornings warmer, color temperature wise, and cooler in the afternoon. Could warmer color temperatures in the morning affect productivity? This doesn't hold true in places where people work without seeing the outside world, even through windows.

What would prove this is if the project team was working three shifts around the clock. Most would agree that due to circadian rhythms of the team members, that for most their most productivity would be highest in the morning, next highest for the evening shift, and the least for the graveyard shift. It has been found that while some can work well in evening shifts, and some even on the graveyard shift, it's also been found that productivity is often higher during the first half of a given shift than the second half. So, the causation appears to be the start of the shift and not which direction sunlight is coming from. What generally has happened is that the people on a particular shift are not too far removed from their sleep cycle.

So, for the morning shift there is a positive correlation between the sun in the east and productivity, but it is not the cause. For the graveyard shift there is a definite negative correlation, as there is no sunlight at all.

Confusing correlation and causation are a common logical mistake. This fallacy is known as post hoc, ergo propter hoc (Latin: after this, therefore because of this) and it occurs when a person argues that because event Y happened after event X, it happened because of event X. Most superstitions fall into this category.

Sometimes the causation, that is the cause and effect can be reversed. For generations it was thought that parents who saw that their children had a positive view of themselves did better, in school, or sports. More recently it was discovered that the two were reversed, it was good grades in school, or success in sports that resulted in children having high esteem.

Confusing correlation and cause can lead to some very strange observations. There is a positive correlation between ice cream consumption and drowning. Conversely there is also a negative correlation between a drop in ice cream consumption and the number of drownings. Hopefully by now you have seen the fallacy. Swimming goes up when the weather is warm, which sadly leads to increased drownings. Warm weather also encourages increased ice cream

consumption. So, ice cream consumption is a coincidence or correlation, and not the cause. The cause is the warm weather.

When we talk about causation, there are necessary, sufficient, conditional, and contributory causes.

Necessary cause of condition – Result Y can't happen unless cause X is present.

Sufficient cause or condition – Result Y always occurs when cause X is present.

If a cause is both necessary and sufficient it is known as Absolute Causality. When pure water reaches its boiling point temperature, or its freezing point it boils or freezes. No other contributing cause is required.

A Conditional cause or condition is when cause X is necessary but is still only one of several factors needed to cause result Y. X is not sufficient in itself. To sell a product to a customer requires more than one conditional cause; a product to sell, and a way to distribute it. Neither by itself is sufficient, but both are necessary. Along those lines marketing and advertising of the product is not a conditional cause to sell the product. You could very well sell products without it. Advertising is therefore a Contributory cause. It will affect the likelihood of the desired outcome, product sales, but not necessary to get at least the first sale.

People also find ways to string sufficient causes to link a distant event with a remote effect. The old chestnut "For lack of a nail, the shoe was lost...." Attempts to show a chain of causation. A BBC television called Connections aimed to show how rudimentary discoveries lead to technology and society structures present at the time.

Analogies

Analogy - a comparison of two different things by showing the various ways in which those two things are similar. An analogy is a means by which we convey a complex thought. Ex: poet John Donne compares two people in love to the legs of a drawing compass - the two legs of the compass can be physically separated but are still always joined by a common pivot.

Comparison or contrast is often used to trigger emotions and thereby suspend reason.

Analogies are abused when they claim similarity and establish identity under the guise of merely suggesting similarity. Analogies only suggest similarity, they do not establish identity. An analogy compares X with Y. If X has a number of properties identical with Y, but X and Y also have a number of properties not identical to each other then there might be insufficient similarity to warrant a comparison. Analogies are abused when there is significant dissimilarity that goes unnoticed. Also, analogies are abused when one particular similarity is used to equate two very different things, or when one particular property is used to predict the other properties.

In challenging an analogy try to find as many significant dissimilarities as you can., try to show that many of the similarities are not significant or irrelevant or are merely coincidental.

Selling new ideas

When a new idea is fostered, there are generally three responses.

There are those who oppose because they benefit from the old way. Don't try to sell a wireless LAN wire replacement to a group in the company whose job it is to install LAN cables. People will resist new ways of doing things if it puts them out of a job or causes them to go through the work of being re-educated. This happened when CAD programs, like AutoCAD, came into the world of drafting. Many draftsmen tried to use AutoCAD like a PC paint program, not learning to use the dynamic scaling features, automatic dimensioning, and other features far beyond what could be done by hand on a drafting board.

Those that will jump on any hot new idea, which means they could easily jump ship. They want change, to eliminate the old status quo, some foreign element is introduced (competition, technology) creating chaos, a challenge, or opportunity, Integration of the response is done, and a new status quo is established.

The CAD field grew from mechanical, to schematic capture onto PC layout. Analog design changed from pencil sketch on a pad to Spice code and later to schematic capture into analog models that simulated using various algorithms in the operation of an analog circuit and displayed the results in both the time and frequency domains. CAD did not leave the RF world untouched either. Programs that calculated impedances of various PC trace configurations even simulating the action of Vector Network Analyzers with S-parameters and Smith Chart displays. Now all areas of electronics from ASIC design to PC layout, including thermal analysis are done in CAD. All this makes it sound like you don't need math and engineering skills! Not at all, your theoretical education along with what you'll learn from senior engineers will allow you to use the CAD programs to build even greater things. Your knowledge of engineering and physics will be what will give you the ability to solve problems where the real world and the CAD programs don't agree.

Finally, there are those who question: they say show me. Some for altruistic, and some for reasons.

Now let's look at methods used to push an idea of concept.

Appeals

Appeal to guilt. Show a bad situation and then say don't you worry about it. Some companies and managers try to tell employees that if the product or company fails it's your fault! Think about this, as an engineer if you build the product within schedule and specs you are a success. If marketing told you to build something that does not sell, it's on them not you. If management does not provide enough staff, leadership, and finances for what is to be done and you to do your job, it's on them. It is your responsibility to voice your concerns about a project that is not feasible or doable if they will listen. If not, then do your best to get the job

done or leave. But know, it takes vision, finances, managing, marketing, engineering, and production all being successful for a product to be successful.

Appeal to fear (argumentum ad mecum) - Portray dire circumstances if your idea isn't adopted. If you don't do X, then Y will happen. Many different managers use many different ways to motivate engineers to get the job done and the product out the door. Fear of failure can be a motivator. It's only one way to pressure people into working harder. The problem with too much pressure is that it hurts creativity and that is a project killer! When you need to get a project done sooner, jumping in, and starting to capture that schematic, design that bracket, fab those parts is a BIG mistake. Managers and engineers' first job is to think. Often ways of reusing previous designs, paralleling efforts, buying expertise that is not in house will allow you to make the target date with a working prototype!

Additional appeals:

Appeal to hope - if you do X then Y might happen. If you want Y then do X.

Appeal to faith - you must have faith in what I am doing.

Appeal to tradition or precedent - we've always done it this way.

Appeals to the "sacred cow" - justice, freedom, democracy, the law, religion. When a person says that because you challenge his statement, you also challenge one of these ideas.

Other general appeals - Flattery, status, bandwagon, love, trust, friendship, pride, loyalty, sincerity.

Confident Speculation - personal assurances, appeals from personal experience, and the domino theory. If we do A, then B will happen, appeal to omniscience - what might have happened if something had or hadn't happened.

Personal Attacks

Another method of attacking ideas, where the person is attacked instead of his idea. This is known as an Ad Hominem attack. From the book *Gaius Verres: An Historical Study*, F.H. Cowles wrote "Ridicule is often the only weapon to conscious inferiority."

Similarly, Circumstantial as Hominem is where a person's ideas are challenged because of a particular position that the person is in.

Guilt by association - A person is judged because of his associations, his friends, his family, not because of anything he has done.

Poisoning the well - Discrediting the personality of the speaker. Do you still beat your wife, or you can talk but not act statements. If you respond you can end up defensive and if silent or provide a short answer you risk being judged guilty. This is related to a Complex question, where an issue is posed that has several ramifications, but those ramifications are either ignored or not recognized. This situation occurs when two or more questions under the guise of one question. Ex: Are you still cheating? Or do you still beat your wife? Two questions in each statement (1) did you ever (2) do you still.

Also mentioned earlier, tu quoque (you too), also known as “passing the buck.” This might also be referred to as the Peewee Herman defense, “I know you are, but what am I?” You do what you are blaming me of argument. Might be a true but irrelevant statement. Also known as shifting the blame.

Counter-question serves to reply to or distract from another.

Ex: Give me a good reason to approve.

Response: Give me a good reason you shouldn't argument.

You can answer a question with a positive statement that has nothing to do with the question.

Question: When will the product ship?

Response: This product will far surpass the competition.

Or a negative observation

Ex: Well, I'd never play poker with her, she's a mean poker player.

Misdirection

Using Authority

Argumentum ad baculum (appeal to force) - ex - threat of contempt of court.

Argumentum ad verecundiam (appeal to authority) - A statement or opinion of some outside source is often referred to in order to strengthen an argument. They can be vague - doctors say, etc. Example of Idol of the Theater.

Aphorisms, clichés, slogans, proverbs, platitudes are sometimes used as authority to convince or persuade. "Where there's a will, there's a way" becomes a substitute for hard thinking and offers only glib encouragement. Again, this is an example of Idol of the Theater.

Suggestion by pompous language - sometimes called jargonize or doublespeak.

Jargon is used to give an impression of authority.

Ex: "Our display gives you 8K/22.1 media".

Deflecting Propaganda

Even if you are in a small project group, you can find instances of propaganda from both inside the group and often from outside of the group. Especially if your group is working on something that appears to be a threat to others in your company. Here we will list the approaches that are used to advance propaganda:

Appeal to the crowd, mob, or gallery (argumentum ad populum) - embraces many other appeals. Uses generalities, clichés, slogans, platitudes, sanctimonious claptrap, and glorifications of the masses.

From the communist party:

One day equals twenty years, we shall sprint to Communism!

The people and party are one!

From U.S. Presidential campaigns:

One of the earliest from 1840: [Tippecanoe and Tyler Too](#)

Tippecanoe was a battle that the Presidential candidate Harrison lead and won and Tyler was his running mate.

From 1952: [I like Ike](#). Or [All the way with Adlai](#).

From Clinton's 1992 campaign: [For People, for a Change!](#)

Propaganda realizes that we are more susceptible in a crowd than in private. We are indeed influenced by what others think and are doing. That if you hear it enough you will become more receptive to it.

Propagandists use the bandwagon (everybody's doing it), repetition, they speak with confidence, they appear earnest and sincere, they make their issues and ideas seem over simplistic, and they use name-calling and stereotyping.

Propagandists use glittering generalities (the poor carry the tax burden in this country), they use easy to remember slogans, and they use the technique of transfer (cigarette smoking with backdrop of pretty landscapes. A variation of the transfer technique is the testimonial.

Another propagandist ploy is to use the "plain folks" or the opposite, the "snob" appeal.

Propagandists use a statistic without context, and large numbers (related to the bandwagon appeal).

Propagandists also use the manufactured problem - the bad guy or scapegoat. The Cloward-Piven Strategy was devised in the 1960s to successfully provide welfare and attempt to solve political problems. The main steps of this strategy are to:

1. Overload a system
2. Create mass panic and hysteria as the system is overloaded
3. Oversee the destruction of the system
4. Replace the former system with a new system

It's been claimed that it simplified says: If it ain't fixed – break it.

Another method is the *Motte-and-Bailey* argument. The name refers to a style of castle built on a mount called a motte, overlooking a courtyard known as the bailey. The bailey served as a tiny, walled village complete with kitchens, shops, and barracks—practical, but difficult to defend against attacks. Under threats of enemy invasion, however, the bailey's residents could retreat to the high, fortified motte.

This occurs when someone presents a controversial, hard-to-defend point—the “bailey.” Then, when another person challenges that position, the arguer replaces the weak point with a more defensible one, representing the motte.

1st person (Bailey): If we use products from X. the project will fail, and we will be ruined!

2nd person: We’ve used X’s products in the past with successful results.

1st person (Motte): I’m just saying that X might not be as competitive as Y.

Examples invoking the Idol of the Marketplace

Idols of the Marketplace, which we talked about earlier, is often in the forefront today, as this refers to words used incorrectly, semantically, to convey ideas. Using deceptive verbiage to convey thoughts.

One can suggest a great deal by accenting a particular word.

“I try to produce great results when my product ships!

If the word *I* is accented is he implying that you don’t?

If the word accented is *try*, is he saying that he doesn’t always?

great – your products are not?

my – is he saying he won’t work hard on your product?

If the above is in writing that someone can twist the original in many ways.

In addition, the tone of voice might suggest an attitude without actually coming out and saying it.

The etymology (origin) of a word is occasionally cited to support a position. Such as using the origins of the word religion to claim it is about fear and control. These kinds of arguments are often fallacies as the meaning of words change over time.

Suggestions can often be made via phraseology:

He is late, verses he hasn't arrived yet.

The pitcher is half full, verses half empty. I am firm, verses you are obstinate.

Another device of suggestion is use of a metaphor - using verbs such as "slinked", "weaseled".

Suggestions by juxtaposition are two statements in proximity to one another used as inference that the two are related when they are not, or to compare or contrast the two, or to make a point. A few famous ones:

Ask not what your country can do for you; ask what you can do for your country. JFK

Injustice anywhere is a threat to justice everywhere. MLK

An eye for an eye leaves the whole world blind. Gandhi

Examples in the project realm:

The project you are working on presents you with much opportunity, but you should be aware of the peril it presents also.

John gives no thought to the needs of his company, just the needs of his project.

Classic literature often has signs of peace with signs of war, or love and hate. In a project sense it can be success with failure, teamwork versus selfishness, hard work versus laziness, diligence versus inattentiveness.

Juxtaposition can also be visual. Showing your product next to an award it has earned. Items found in one's workspace are an example of the person "juxtapositioning" objects with themselves.

In order to discuss a topic productively, you must identify and evaluate certain questions to be answered.

Irony is when you get a result that wasn't expected. Or when you expect one result (A), but instead you get (B). Situational irony is when a salesman inadvertently convinces a client to buy from his competition, or when a project team works diligently to get the product shipped on time, and the truck carrying it crashes and the product is ruined. Spoken Irony is when we mean the opposite of what we actually say.

He's like the inventor of basketball, James Naismith.

Naismith did indeed invent the game, but as a coach of it he had a losing record.

Verbal ambiguity occurs when one uses a word or phrase that has two or more possible meanings or interpretations, or when there is an event that can have more than one interpretation is possible, and the person will have to arbitrarily select one of the possible choices. These are double-entendres:

Our lead engineer makes a perfect snack.

No, not cannibalism, he prepares a good snack.

From a Calvin and Hobbs cartoon:

Hobbs: Is it a right to stay ignorant?

Calvin: I don't know but I refuse to find out.

This is closely related to:

Gail: What is the difference between ignorance and apathy?

Tom: I don't know, and I don't care.

There's one obvious meaning that the two phrases are the correct definition to the question. The second is through innuendo and implies that Tom is responding rudely to Gail's question.

Also, homophones can often cause confusion: alter/altar, ate/eight, band/banned, blew/blue, by/bye/buy, etc.

Ambiguity of statements can result from imprecise language. Using words such as nice, rich, competent, shorter. Nice compared to what, how rich, competent at what, shorter than what (short implies short, period, not shorter than a 6'5" center?

Terms such as good/bad, like/dislike can have 3 degrees - The presence of the quality that the term denotes, the absence (or complement) of that quality, and the opposite of that quality. Good, not good/not bad, bad; like, don't dislike, dislike. Complimentary terms and opposite terms don't always equate to the same meaning.