Fire Bullets, Then Cannonballs

Chapter 4

ADS 710

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Agenda

1. A Science Analogy
2. Key Concepts from the Book
3. Examples
4. Discussion Questions

A Science Analogy

Accuracy and Precision

Accuracy vs Precision

- In scientific experiments, we often strive to be **accurate** and **precise**
- **In an ideal scenario**, results in an experiment should be accurate **AND** precise
- However, we know that **nothing is ideal**, nothing ever goes exactly to plan; **lots of experimental error**
- But, **we must try** anyways
- We must attempt, **understand the results**, and attempt again

Definitions

- **Accuracy** is the **closeness the results** are to the **intended target**
- **Precision** is the **closeness the results** are to **each other**

Accurate But NOT Precise

- **Accurate** because all of the darts are close the target
- **Not precise** because the darts themselves are not close together

Precise But NOT Accurate

- **Not accurate** because all of the darts are not close the target
- **Precise** because the darts themselves are close together

High Precision
Low Accuracy

NOT Accurate and NOT Precise

- **Not accurate** because the darts are not close to the target (or totally off the board)
- **Not precise** because the darts are not in close proximity to each other

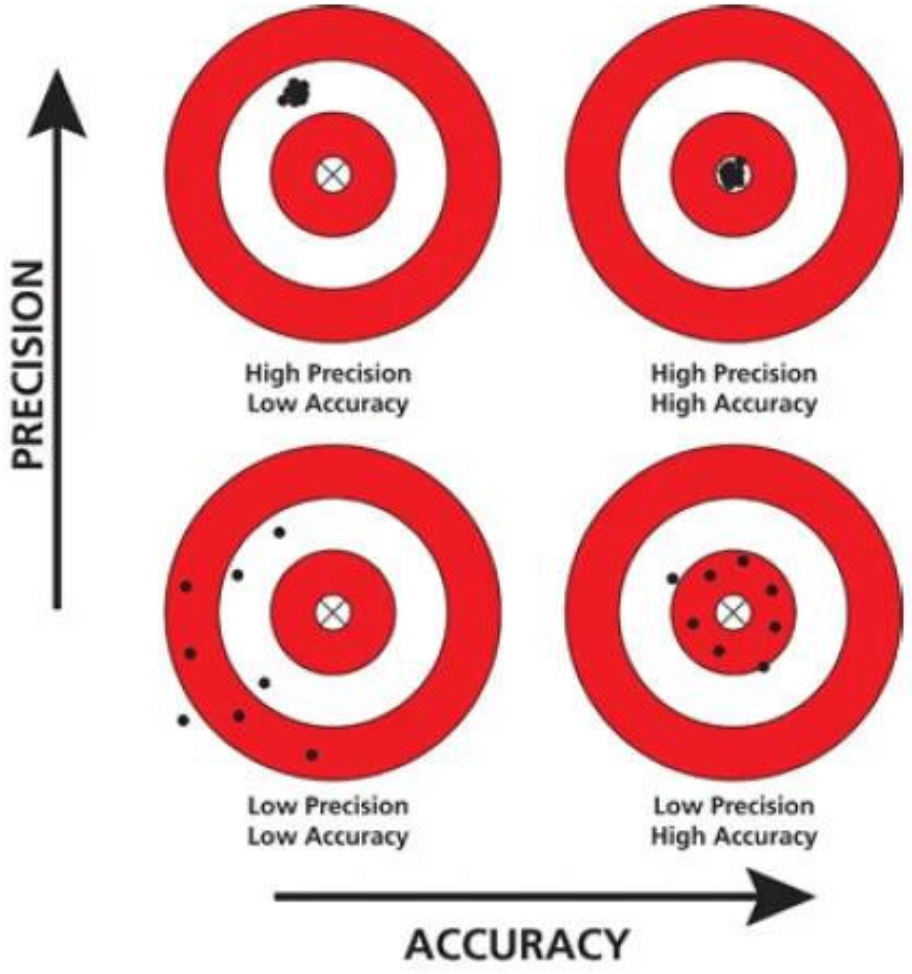
Low Precision
Low Accuracy

Accurate AND Precise

- **Accurate** because all of the darts have hit the target
- **Precise** because all of the darts are close together

Putting It All Together

- It is obvious what the ideal scenario is – we want to be accurate (close to or at target) and precise (repeated attempts are close together)
- ***But, how do we get there?***
- Specifically, how can we make it so that our **actions**, **behaviors**, **attitudes** yield **accurate** and **precise** results for our respective industries?



Things to Ponder …

- Who is/are throwing the dart(s)?
- The person (or people) throwing the dart(s) – are they trained/skilled?
- How many darts are we throwing? If we only throw one dart, are we truly precise?
- What is the target? Is it specific enough? Is it too general? What is considered a success? This will determine how accurate you are.
- Do the people throwing the dart(s) understand the target?
- What are the darts made of? Will they provide enough weight to make an impact on the target?
- What if we used something bigger, like a cannonball, instead of a dart? You might hit the whole thing, but it could damage it; challenging to repair
- Are we using the attempts at hitting the bullseye as teachable moments to re-adjust for next time?
- Who is analyzing the results of the attempts?
- How do we improve? Are we disciplined and consistent enough to improve?
- Did we do everything we could to try and hit the target or did we just simply hope that we would?
- Are we the first to do this or have other people done it?

Considering all of these things will help us be more accurate and precise because it will provide evidence as to how close we are to the intended target!

Key Concepts from Chapter 4

Empiricism

- A big concept in this chapter is **empiricism**
- Another science concept! Also, philosophical
- Empiricism posits that ***true knowledge is developed and understood through observations and experiences – these help develop facts because they are observed or experienced.***
- Empiricists do not rely on ***beliefs, intuition, imagination, or luck*** to make decisions
- Companies should be relying on **empirical evidence** to help make decisions

How Do We Get Empirical Evidence?

- First, companies must fire bullets **before** they do anything big like fire a cannonball
- Bullets are:
  - Low-cost
  - Low-risk
  - Low-distraction
- Bullets are fired to test how a particular idea might fare in a real life context

Accuracy and Precision

- Companies don’t know ahead of time which bullet will hit the board let alone be close to the bullseye
- Results from firing bullets can help determine:
  - Did we reach our target or are we all over the map?
  - Is our target unrealistic or unattainable?
  - Is our bullet not designed properly?
  - How many times have we repeated this?
  - What is the design of the bullet? Should we abandon these bullets?
  - Are the right people firing the bullet? Are they equipped/training to fire a bullet?
- **Regardless of the results** – companies need to consider these before firing a cannonball and use the evidence to recalibrate

Cannonballs

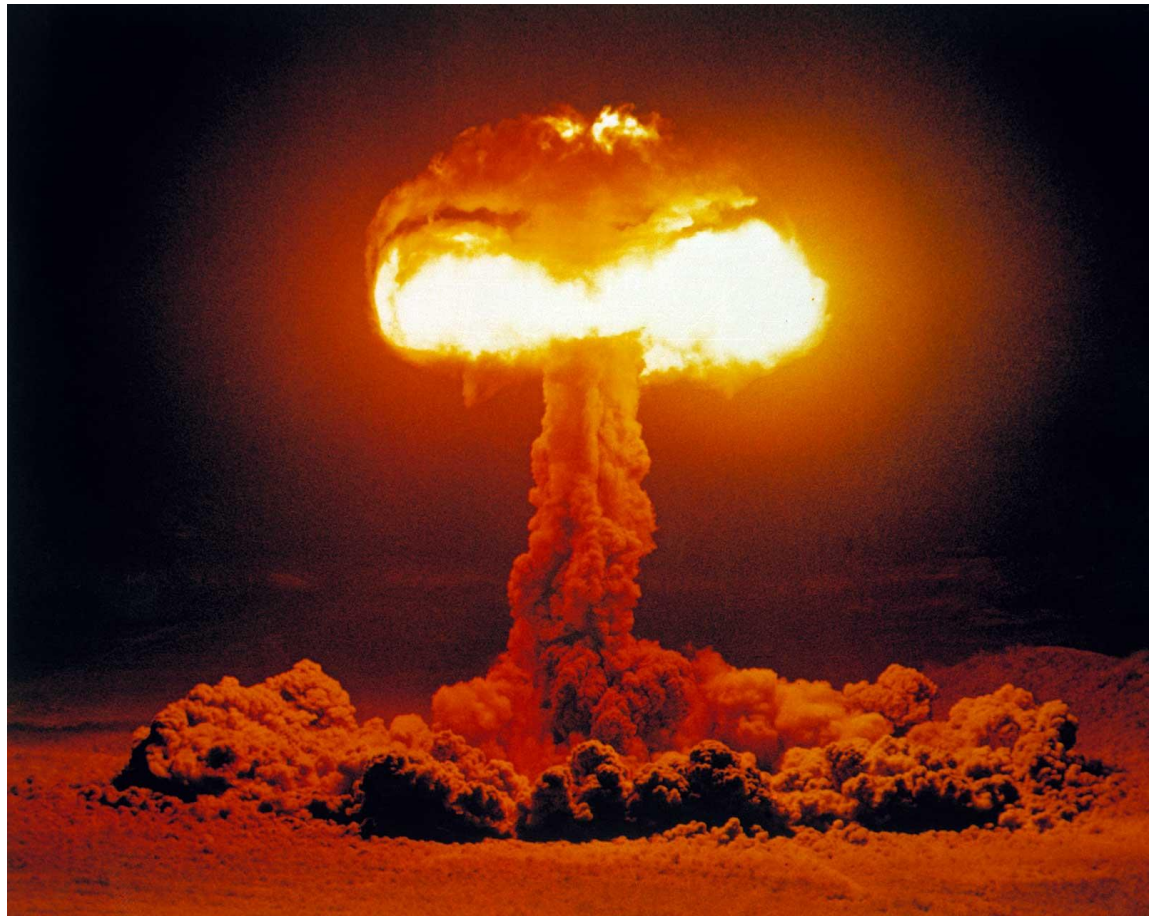
- Cannonballs are **bigger commitments** in terms of finance, time, energy; **more risk, bigger consequences**

Calibrated	Uncalibrated
- Uses empirical evidence (i.e. data related to how accurate and precise the bullets were) - informs bigger decisions - allows companies to assume more risk comfortably - tend to result in large returns	- does not use evidence - assumes a lot of risk - might as well make decisions with a blind fold on - did not produce large returns

- It is important to note that cannonballs **SHOULD** be fired! **Companies should be making big commitments.** But, they must be calibrated.

Uncalibrated Cannonballs That Don’t Hit The Target

- Very costly to the company
- Left the company exposed
- Did not result in large returns
- Interestingly, comparison companies in the book tended to double down on their mistakes; they tried to fix the original mistakes by firing yet another uncalibrated cannonball



Uncalibrated Cannonballs That Hit The Target

- At first glance – success!
- However:
  - False sense of capability – could they do it again?
  - Could be simply luck/serendipity
- Might reinforce poor internal process, poor leadership, and poor management
- Inflated egos

Innovation Does Not Equal Success

- Threshold for innovation is different depending on the industry; you know your industry best
- 10xers seemed to be less innovative than comparison companies
- 10xers seemed to be more disciplined, intentional, reflective, and consistent
- True success stories can blend and carefully balance discipline with creativity (i.e. Apple under Steve Jobs)

Examples

1. Student Assessment

- Student assessment should include lots of areas to practice skill building and applying knowledge
- Feedback should be given frequently and it should be descriptive so the student can demonstrate improvement
- If you want the student to hit the bullseye, they need to learn how to use the bow, practice aiming, and firing; they need to develop a technique and strategy!
- The big evaluation (or cannonball) should be the culmination; the ceremony of taking a test with prior adequate practice

1. Student Assessment

- I see this often in my school where:
  - Teachers will assign a large evaluation or a complicated project
  - Teachers haven’t adequately deconstructed and analyzed the project or summative evaluation to determine what specific skills or knowledge is needed for the student to perform well
- Teachers shouldn’t be giving students cannonballs if they have not administered the small, low-risk bullets
- You can’t consolidate what you don’t know

2. Graduate Trackers

- This year, admin wanted teachers to meet with all high school students once a month to mentor, motivate, and guide
- We were expected to meet 1-on-1 to have a conversation, fill out a form, and report back
- Each teacher was given a roster of students to meet with based on pre-existing relationships

2. Graduate Trackers

- Great idea; poorly executed
- Underestimated time commitment
- Understaffed; more students assigned to each teacher
- We were told to use our preps; not all teachers had preps in the same semester
- I did it for the first month, because I had a prep, but things got busy and didn’t last
- Whole project fizzled out; students really liked it but were eventually disappointed because teachers couldn’t keep up
- Could have been piloted just with graduating students and a few teachers to see how it went

3. Re-Designing Courses

- I went to a 4 day seminar in March regarding assessment
- Learned a lot of great ideas
- Had to show current unit plans, assessment pieces, and course outlines I use for high school
- Was super inspired and went home and re-designed my grade 12 courses

3. Re-Designing Courses

- Course facilitator appreciated my enthusiasm
- However, they warned against changing too much all at once
- They said that if you want to implement changes in instruction:
  - Only change about 20% the next time I teach the course
  - After that, change another 20%
  - After that, change another 20%; and so on
- It takes about 4-5 years (or 4-5 times of reteaching the course) to fully re-design a course properly and so that it is calibrated
- If you change it all too much too quickly, you end up turning into a brand-new teacher because you're implementing strategies you've never tried before

Discussion Questions

Take Your Pick!

- How innovative is your industry? What is the innovation threshold for your industry?
- How might you strike a balance between creativity and discipline without stifling employees or coming across as contrary?
- Is there a project you're working on that has been:
  - Accurate, but not precise;
  - Precise, but not accurate;
  - Not accurate and not precise, or;
  - Accurate and precise?
- Which of the following do YOU need to do more of:
  - Fire more bullets;
  - Analyzing empirical data;
  - Resist the urge to fire uncalibrated cannonballs, or;
  - Commit to firing more calibrated cannonballs?