

Welcome!

DATA-DRIVEN DECISION MAKING FOR BUSINESS



Ted Kwartler

Data Dude

Types of data

Numeric:
1.2346

Factor:
Small, Medium,
Large

Expanded Definition:

Model KPIs
Visualizations
Dashboard Learnings

Boolean:
True, False

String:
“I Love learning at
DataCamp”

Forms
of
Data

Exploring patterns without an outcome

Exploratory analysis

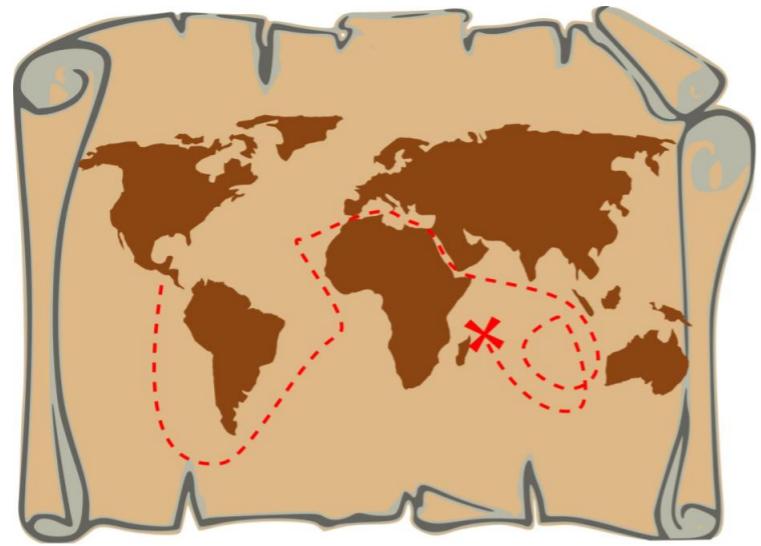


To understand a market or business opportunity more fully without a predefined outcome

Example: Identify common characteristics among patients

Explaining a specific outcome

Explanatory analysis

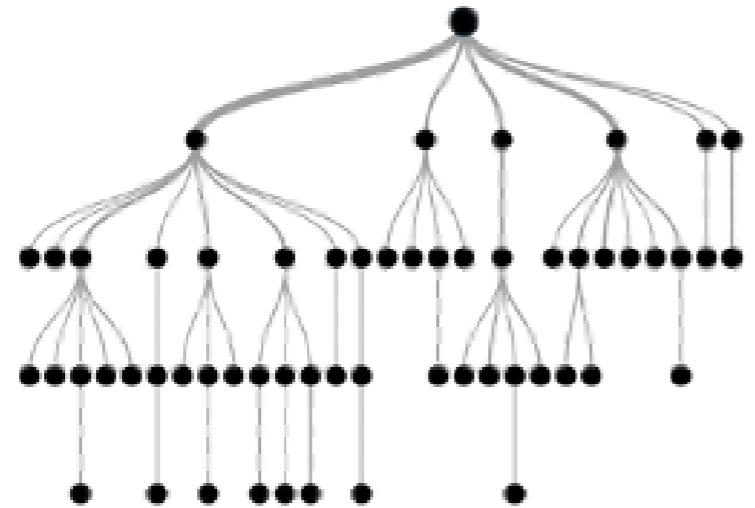


Explain or simulate a specific phenomena such as seeking profit or decreasing expenses

Example: Explain why diabetic patients discharged on Fridays are readmitted more often

Predicting a future outcome

Predictive data decisions



Specific record prediction, often most accurate model matters over understanding

Example: Predict the probability of a patient's readmission

Who is doing the analysis and why is the analysis being performed?

Type	Perspective	Why?
Exploratory	Strategic	Confirm understanding and gain expertise
Explanatory	Strategic/tactical	Learn complex interactions for efficient and easier operations
Predictive	Tactical	Drive specific results and often automate decision making

How was the data collected and when?

Probing an analysis effectively

- **DATA**
 - Is the data available?
 - What data was used?
 - Is it appropriate for the task?
 - Does it have bias such as underrepresented race or gender?
 - Does it have integrity issues, like significant missing data?
 - How was it collected?

What method is being applied?

Probing an analysis effectively

- **METHODS**
 - What methods were applied?
 - Were alternative methods attempted? If so, did the results differ?
 - What is the trade-off between simple and complex methods?

What was the outcome?

Probing an analysis effectively

- **RESULTS**
 - Tell me about the results.
 - Were the results in line with expectations or did something stand out?
 - How does this finding deliver value or solve our problem?

Who is being impacted?

Probing an analysis effectively

- **IMPACT**
 - How much does this analysis address the problem we're trying to solve?
 - Are there regulations that affect this use case?
 - How could this go wrong? Are there unforeseen impacts to stakeholders that need to be addressed?

Let's practice!

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Analysis as a journey

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Know what you know and learn what you don't

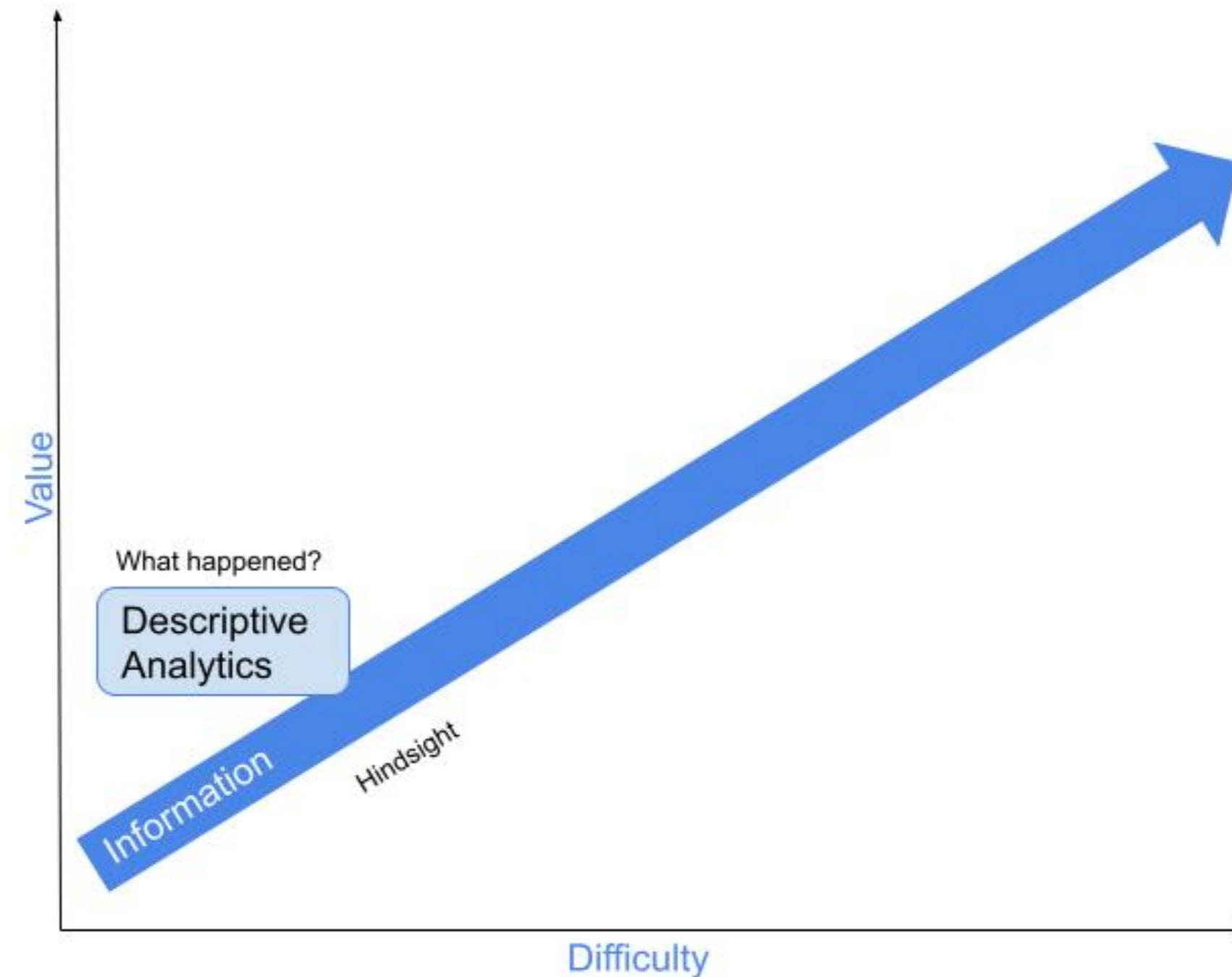


The same is true for organizations.

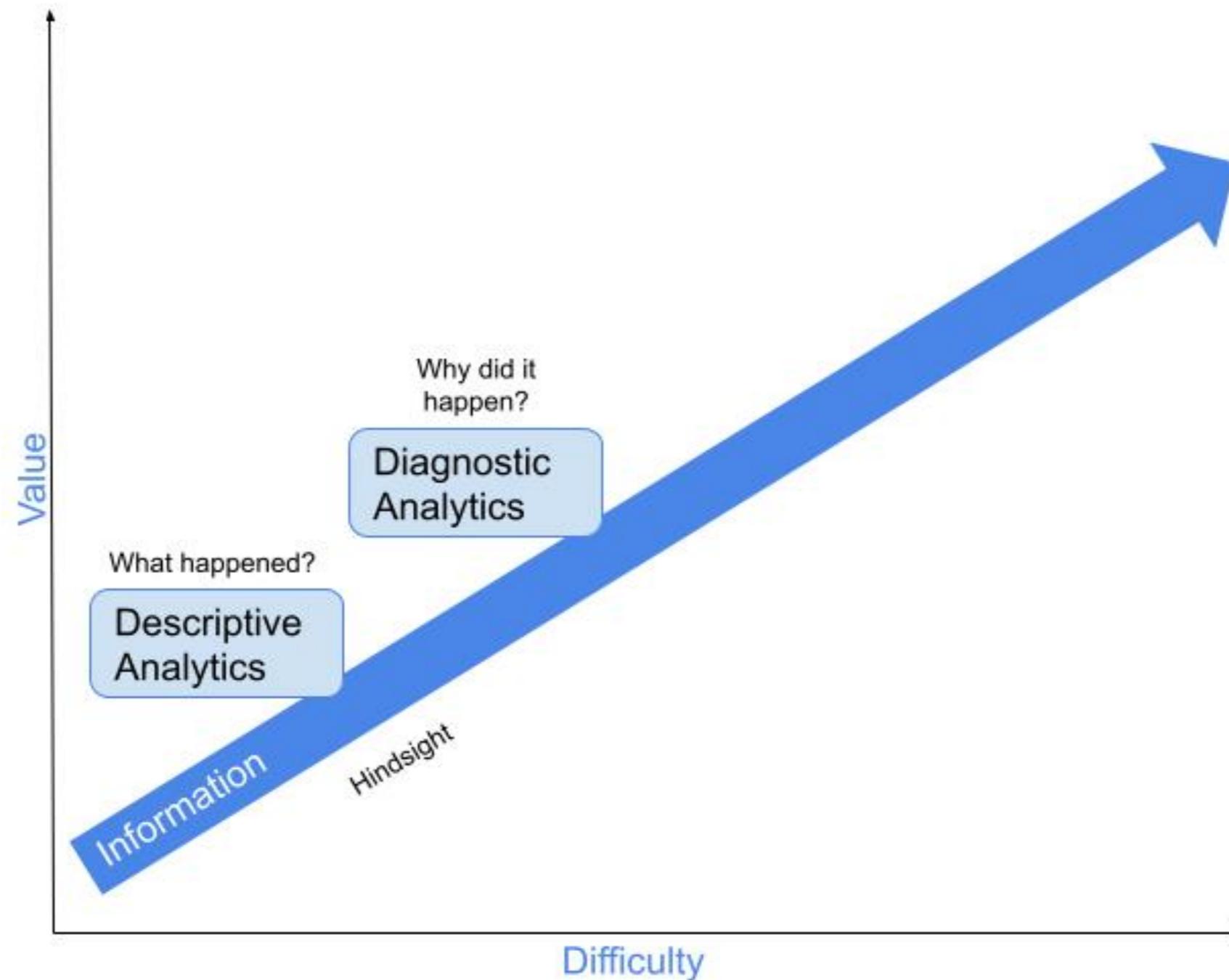


- Lack of data
- No technical personnel
- HIPPOs (Highest Paid Person's Opinion)

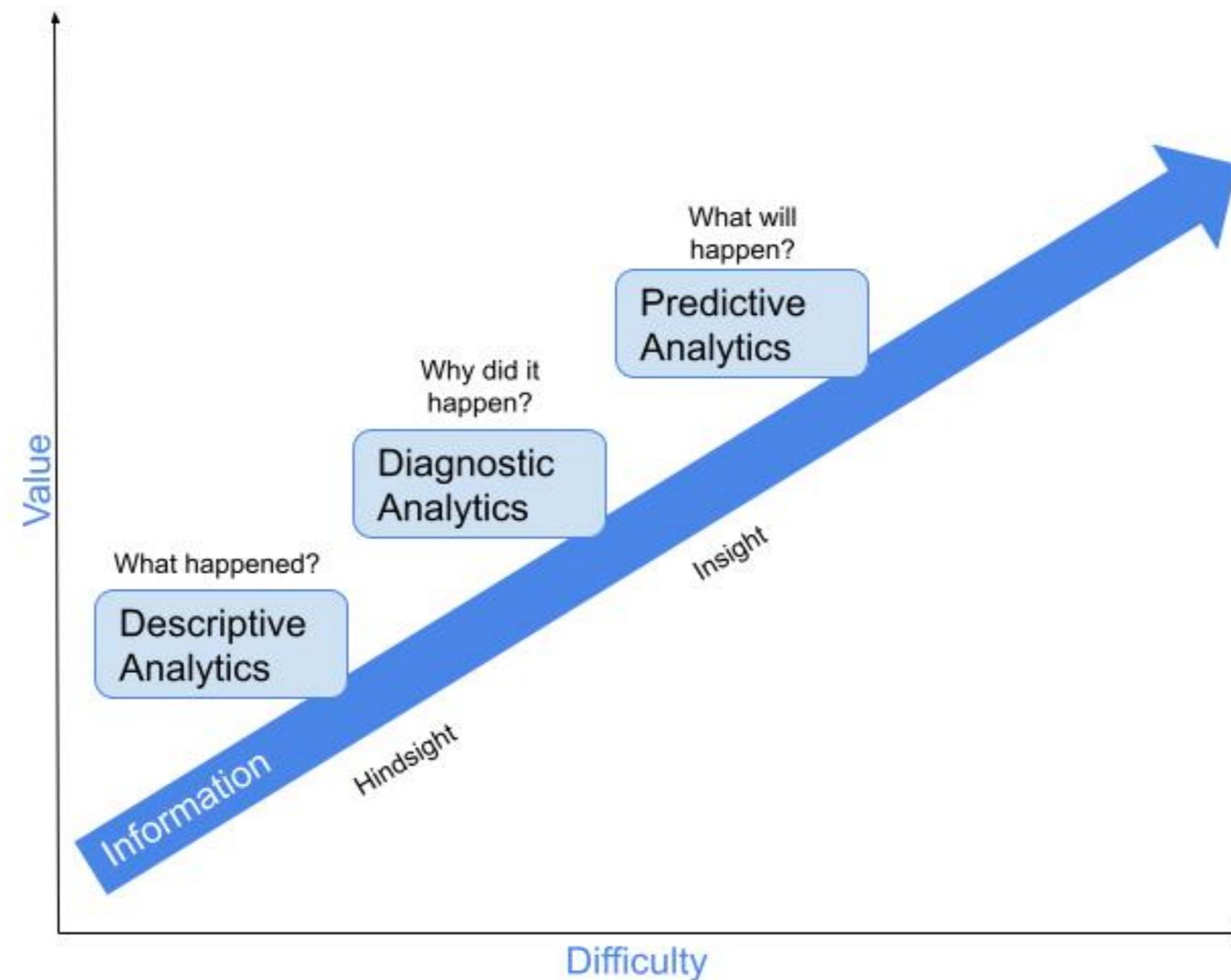
Maturing a data-driven culture - Descriptive



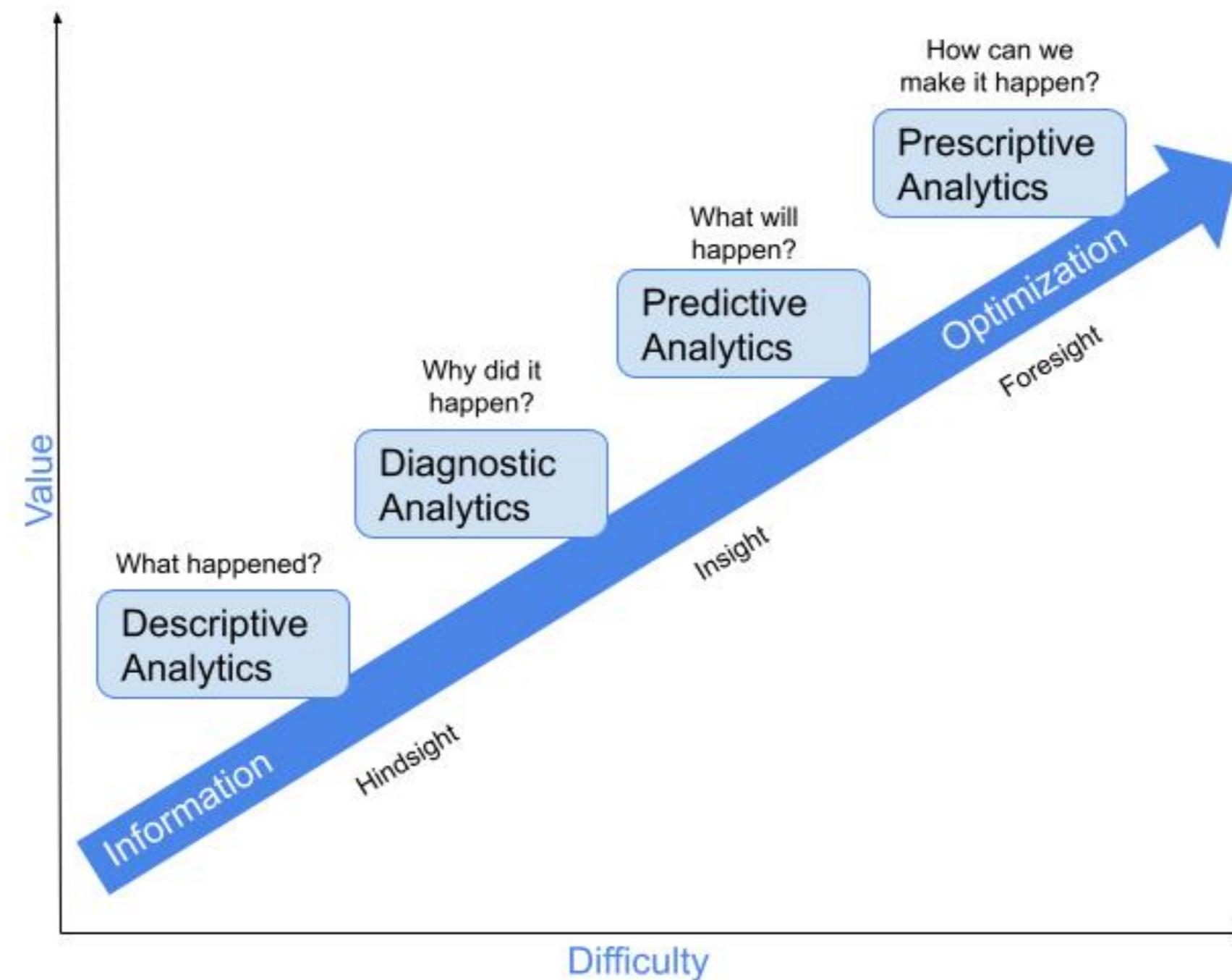
Maturing a data-driven culture - Diagnostic



Maturing a data-driven culture - Predictive

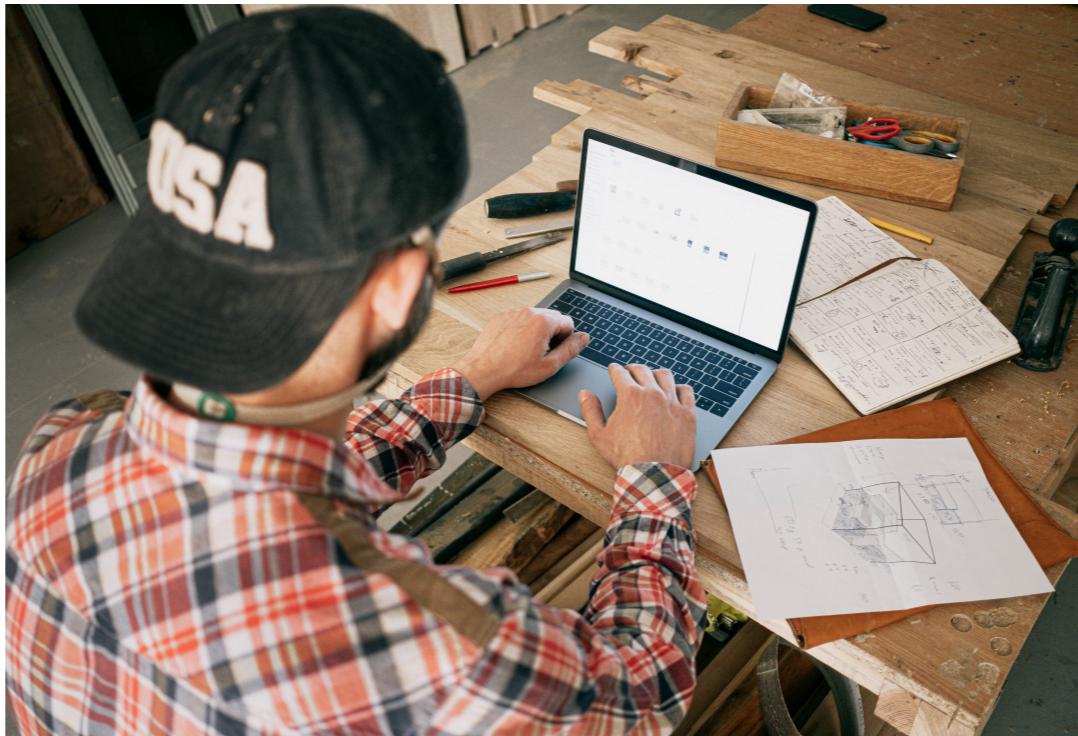


Maturing a data-driven culture - Prescriptive



Cost vs benefit

- Analytically determine the **cost** of a decision
 - *Cost*: new software is expensive
- Analytically determine the expected **benefit**
 - *Benefit*: increased widget-making



Risk vs reward

- Analytically determine the **risk** of a scenario
 - *Risk* : startup fails, \$0 left
- Analytically determine the **reward** of a scenario
 - *Reward* : if it works, you'll be rich!



Supply vs demand

- Forecast the expected **demand** for personnel, material or system need
 - *Supply* : how many agents should be staffed?
- Analyze the needed **supply** of the personnel, material or system need to meet demand
 - *Demand* : how many calls will the company receive?



Putting it all together

	Cost vs benefit	Risk vs reward	Supply vs demand
Exploratory			
Explanatory			
Predictive			

Examples

	Cost vs benefit	Risk vs reward	Supply vs demand
Exploratory	Does social media indicate a product innovation X is needed vs the cost to develop it?	This house's distance to a fire station explains something about fire risk.	Reviewing marketing spend across channels
Explanatory	Which content is most popular and best for paid traffic?	Tracking a popular investing site's stock mentions to explain retail investing patterns	Explaining specific market trends
Predictive	Which house will respond to a postcard?	Predict a fair price for a car	Predicting demand

Let's go!

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Applying the methods and objectives

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Poor Dale



Hot dog research & development



- A new product idea is pitched by the CEO (*HIPPO alert*)
 - People like bananas
 - People like hot dogs
 - Natural business opportunity

Where's the data?

- ~~Predictive~~
 - Predictions require historical patterns.
There are none.
- ~~Explanatory~~
 - Explanations are hard without data.
- ~~Exploratory~~
 - This is completely new territory for the company.



What is the point?



- ~~Cost vs benefit~~
 - Possible unsold dogs!
- ~~Risk vs reward~~
 - Making \$1m a dog on paper won't help without a *real* demand.
- **Supply vs demand**
 - Demand drives the supply needed, which can aid cost vs. benefit and risk vs. reward.

Exploratory market demand

	Banana	Hot dog	Banana dog	Banana hot dog
Mentions in the last 10 hours	50	88	7	3
Brand mentions (pct of posts)	17%	70%	4%	1%
Positive Sentiment	0.70	0.52	0.18	.48

- **Few product mentions** = no consumer saliency for the idea
- **No brand mentions** = no consumer aligns a company with the idea

Phew... avoided that nonsense!



	Cost vs benefit	Risk vs reward	Supply vs demand
Exploratory			Banana-dog
Explanatory			
Predictive			

Let's practice!

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