Total addressable market

DATA-DRIVEN DECISION MAKING FOR BUSINESS

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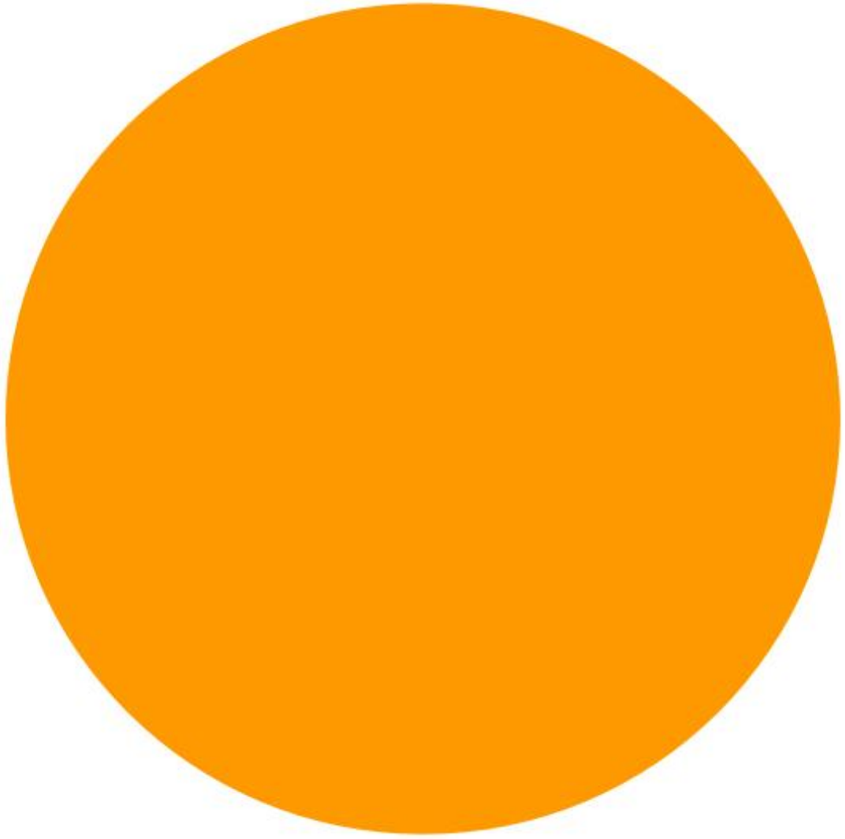
Total Addressable Market (TAM)

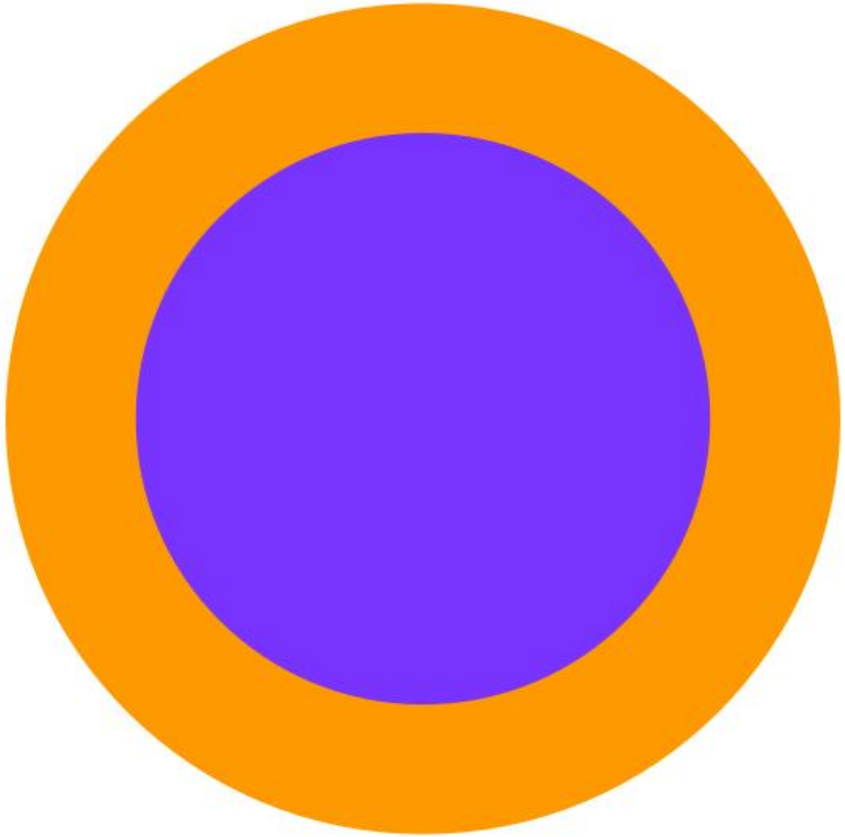
TAM: What is the entirety of the market?

Total Addressable Market (TAM)



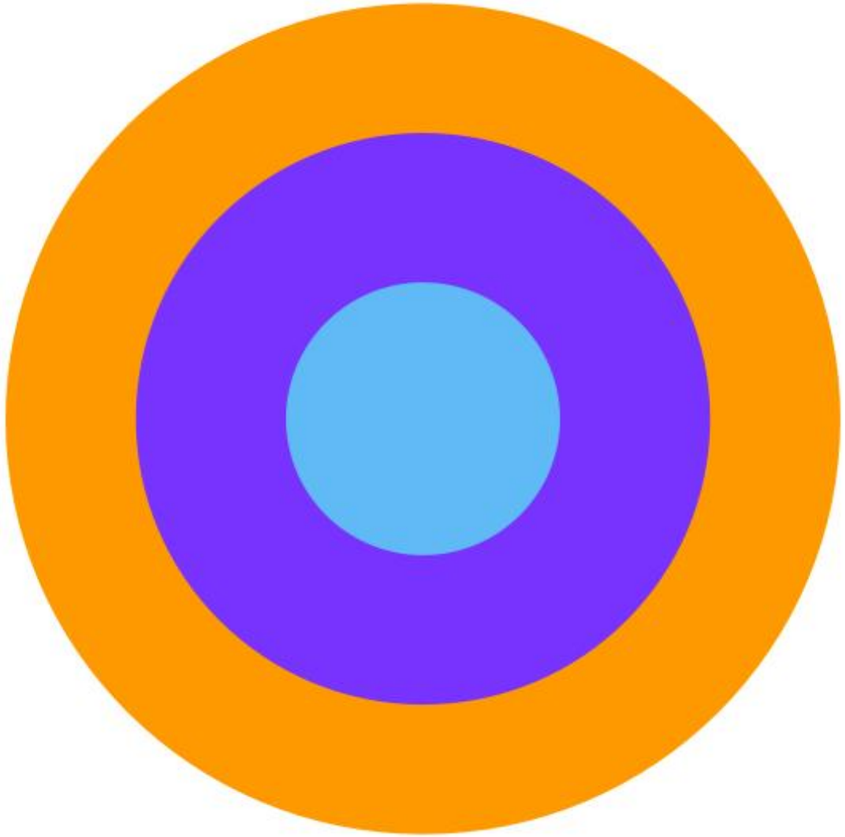
SAM: What part of the market can your company get?

Serviceable Available Market (SAM)



SOM: What proportion of market can you reach?

Serviceable Obtainable Market (SOM)



Calculating TAM

- "Swag" math
  - Inputs: best estimates
  - Data-driven decision to enter the market
- Two popular methods:
  - Top-down
  - Bottom-up

TAM: Top-down market sizing

Top-down TAM

1. Start with macro data set
2. Logically apply interactions

Example

```
330 US Citizens
* 10.5% diabetics
* .75 bars per person
* 100% margin ($1)
 = $25.25M TAM
```

Data points

- **U.S. and World Population Clock**
- **The Most Popular Candy Bars in America**
- **Typical Retail Markups on Candy**

TAM: Bottom-up market sizing

Bottom-up TAM

1. Start with granular data
2. Logically extrapolate upwards

Example

```
$8B annual revenue
/ 63 candy bars = $127m
```

```
$127m * 10% of revenue is sugar free *
100% margin($1)
 = $12.7M TAM
```

Data points

- **The Hershey Company**
- **List of products manufactured by The Hershey Company**
- **Price increases, sugar-free innovation on tap from Hershey**

TAM to the moon!

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Demand curve: meals and drinks

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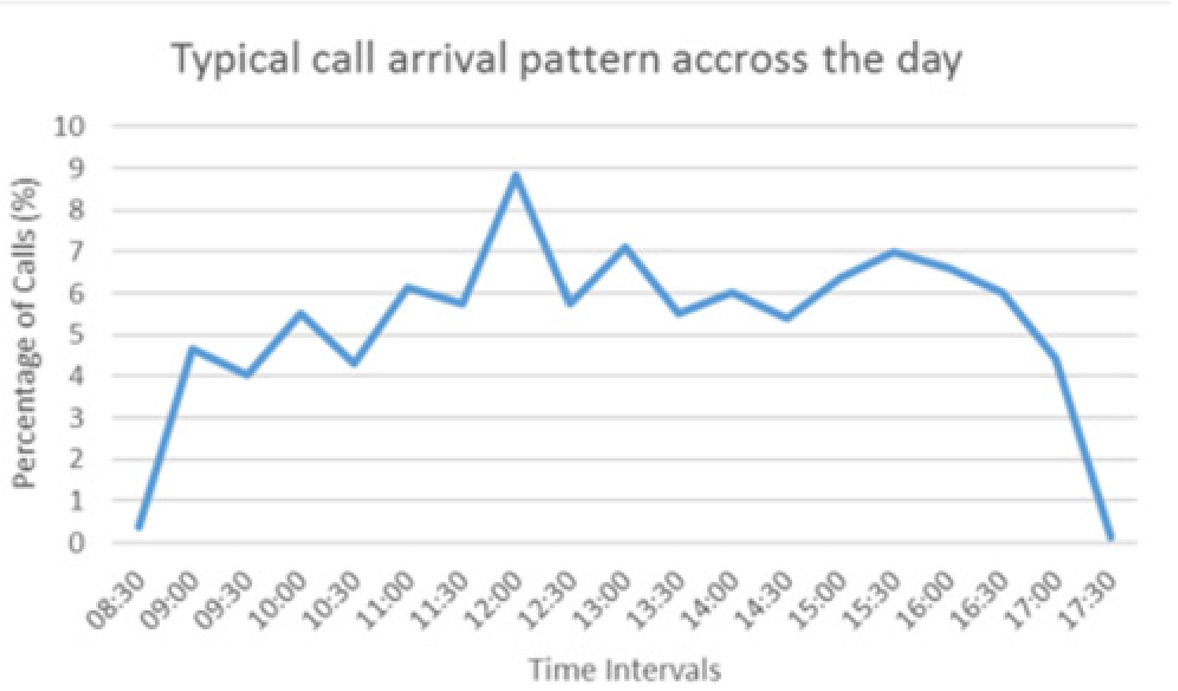
Understanding demand, helps you ensure supply

Resource supply

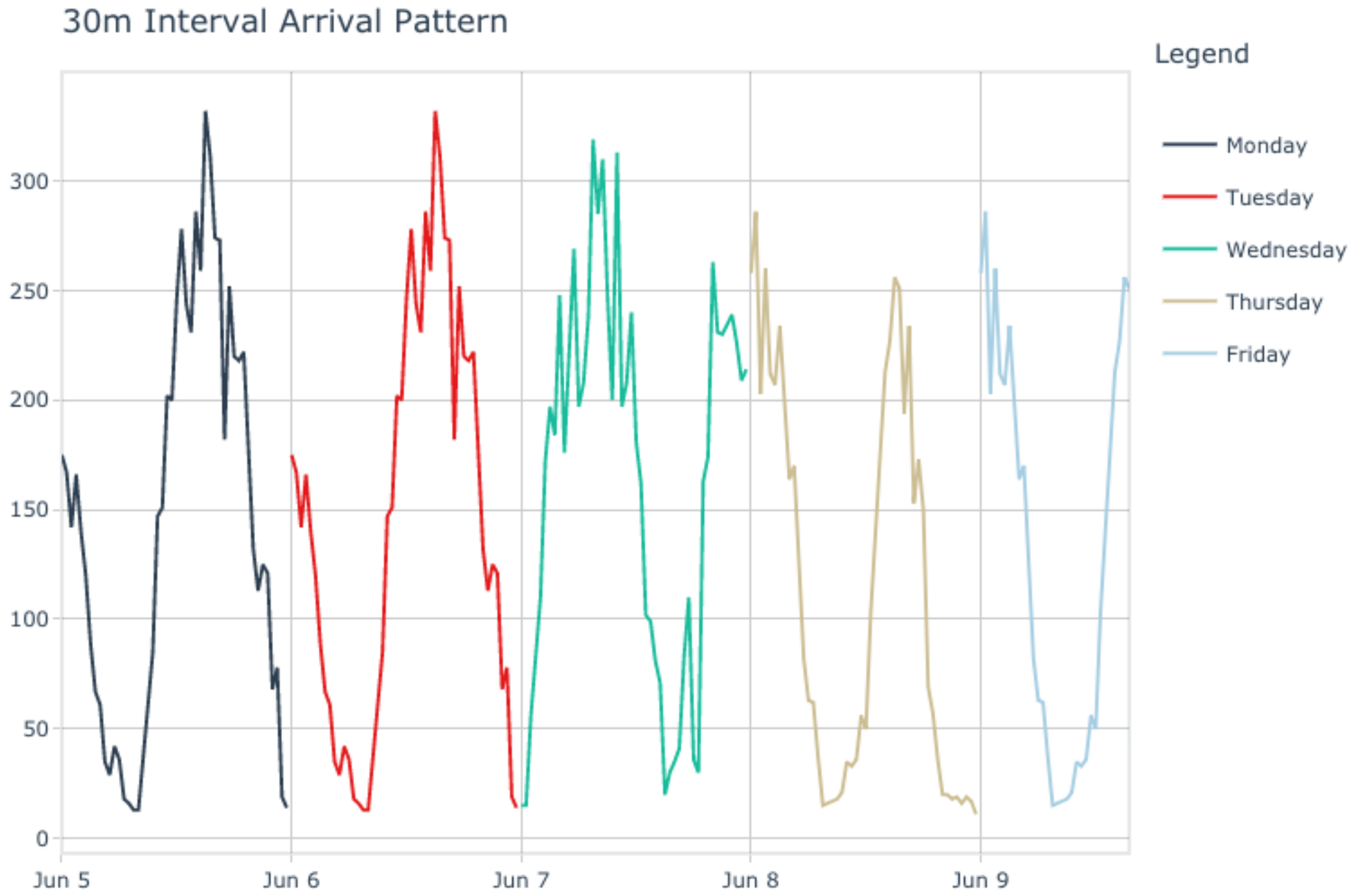
Resource demand

Time series arrival patterns



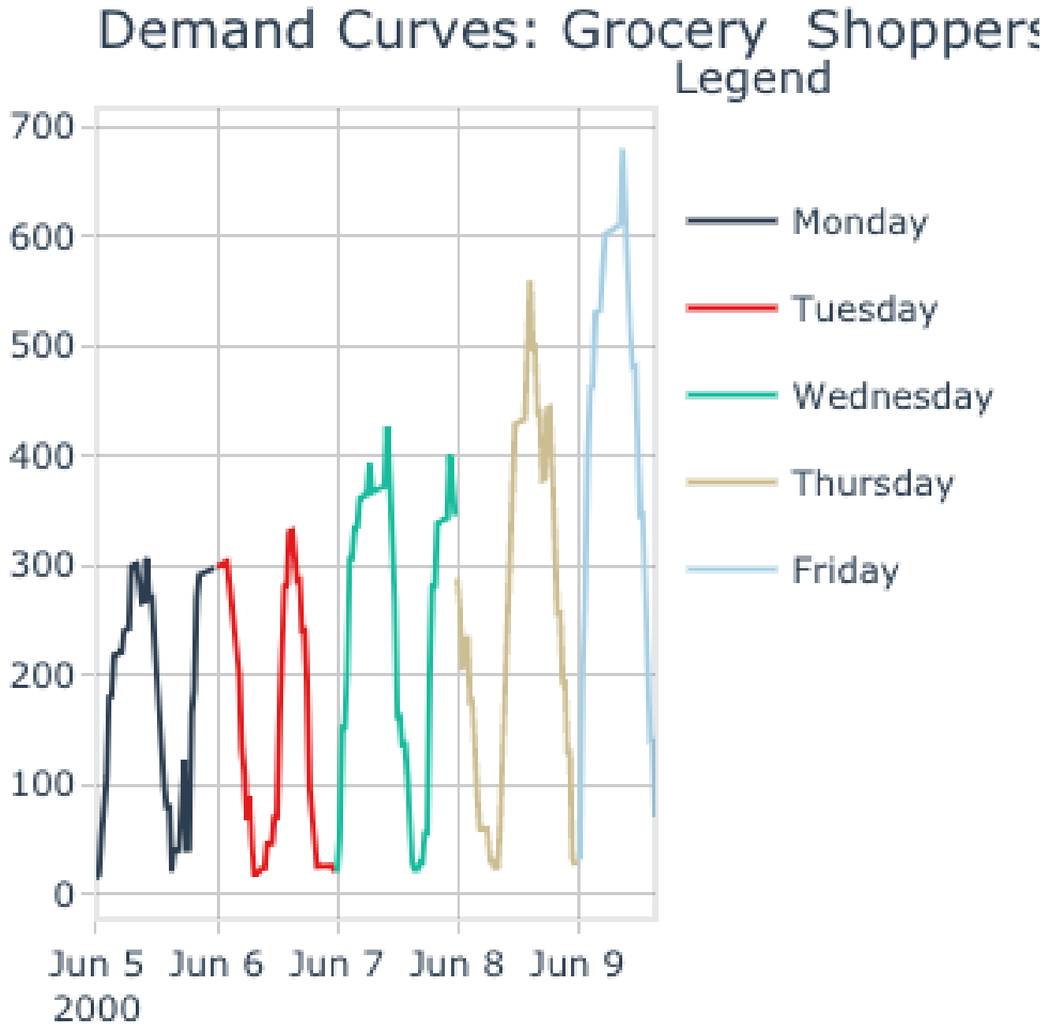
- x-axis is the time periodicity
- y-axis is a volume to be measured

A time series chart



Supply and demand

- Line chart represents the demand
- Create a corresponding supply



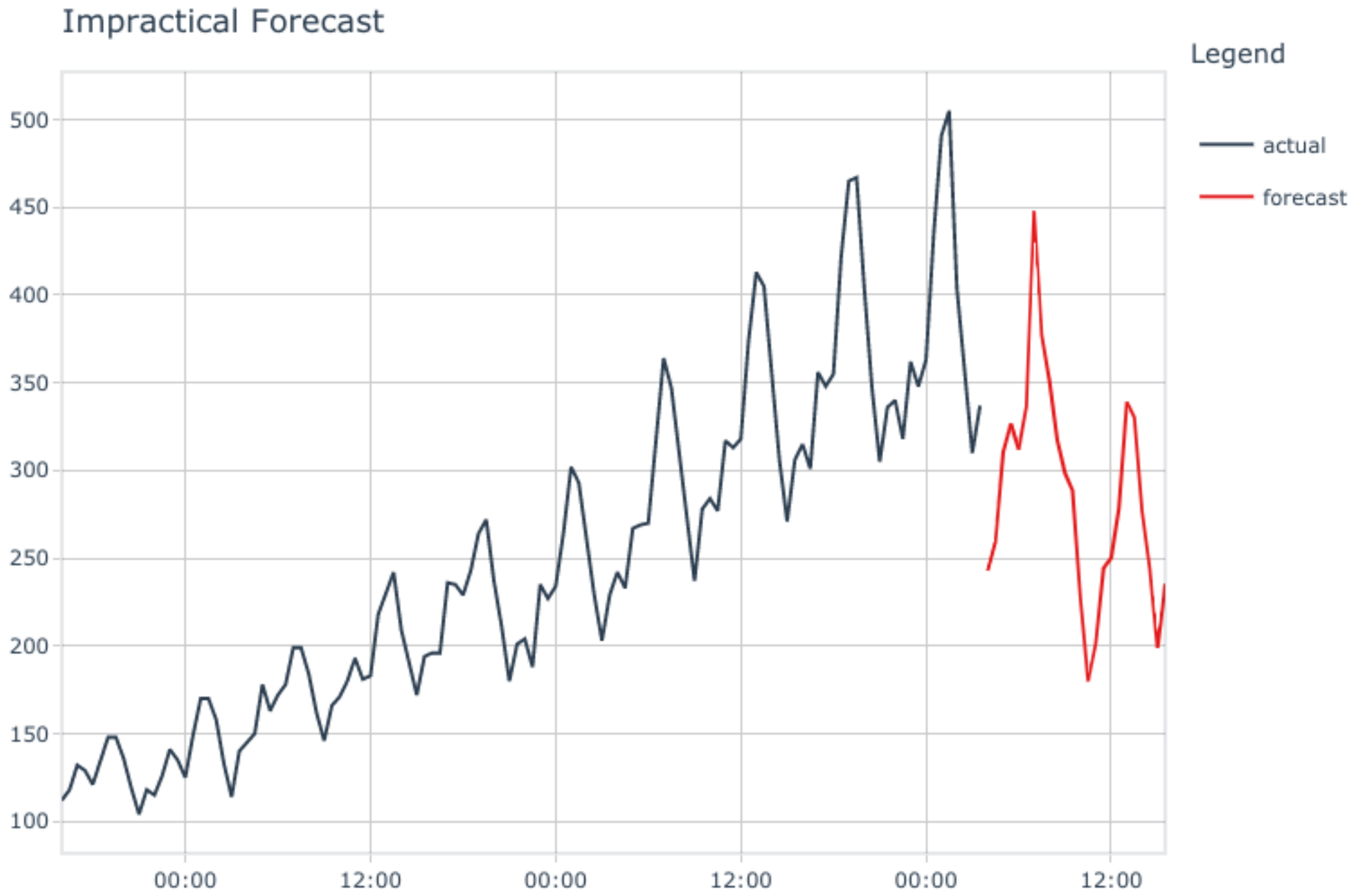
Use common sense

- Data scientists use the arrival pattern to predict future demand
- Mistakes can occur

Common pitfalls

- Inconsistent trend compared to business knowledge
- Decimal points when integers are needed
- Negative numbers that don't apply in the real world

A questionable forecast



Let's practice!

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Supply curve: servers for your restaurant

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Determine an appropriate supply to meet the demand

Approach 1

Inputs

- 100 calls in 30 minutes
- 5-minute transaction time

Extreme outputs

- 100 agents
  - no customers wait
  - 5 minutes of work per employee
  - 25 minutes of idle employees

Determine an appropriate supply to meet the demand

Approach 2

Inputs

- 100 calls in 30 minutes
- 5 minute transaction time

Extreme outputs

- 1 agent
  - 94 customers wait
  - 30 minutes of work per employee, non-stop work
  - Some customers would just hang up! Missed opportunity!

Erlang-C formula to the rescue

- Four inputs
- Returns the number of agents/servers/workers needed

Input	Definition	Example
Rate	How much demand is occurring?	100 calls per 30min
Duration	How long to complete 1 unit?	5 minutes per call
Target	How long can work wait?	People can wait *up to* 20 seconds
Service goal	What percentage of work units need to be serviced under target?	80% of calls will be serviced under 20 seconds

Math? Ain't nobody got time for that

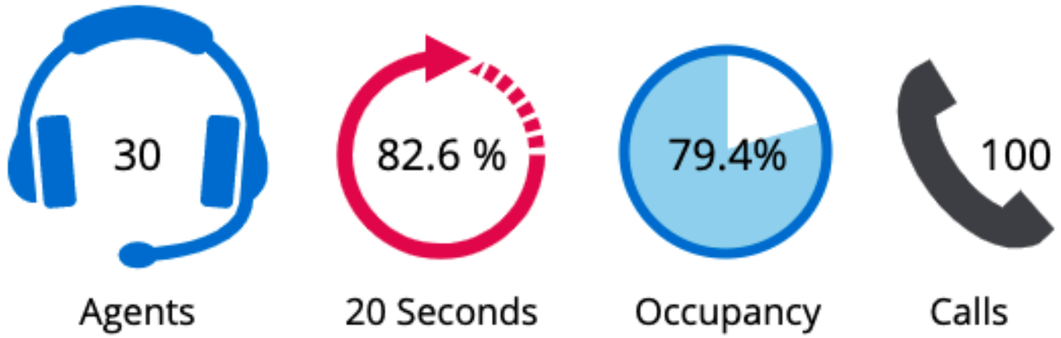
$$P_w = \frac{\frac{A^N}{N!}\,\frac{N}{N-A}}{\left(\sum_{i=0}^{N-1}\frac{A^i}{i!}\right) + \frac{A^N}{N!}\,\frac{N}{N-A}}$$

Balancing incoming calls, wait time, and agent occupancy

Inputs

- 100 calls in 30 minutes
- 5 minute transaction time
- People can wait up to 20 seconds
- 80% of calls need to be answered within 20 seconds

Results



Hurry up and wait

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Customer input to improve your operation

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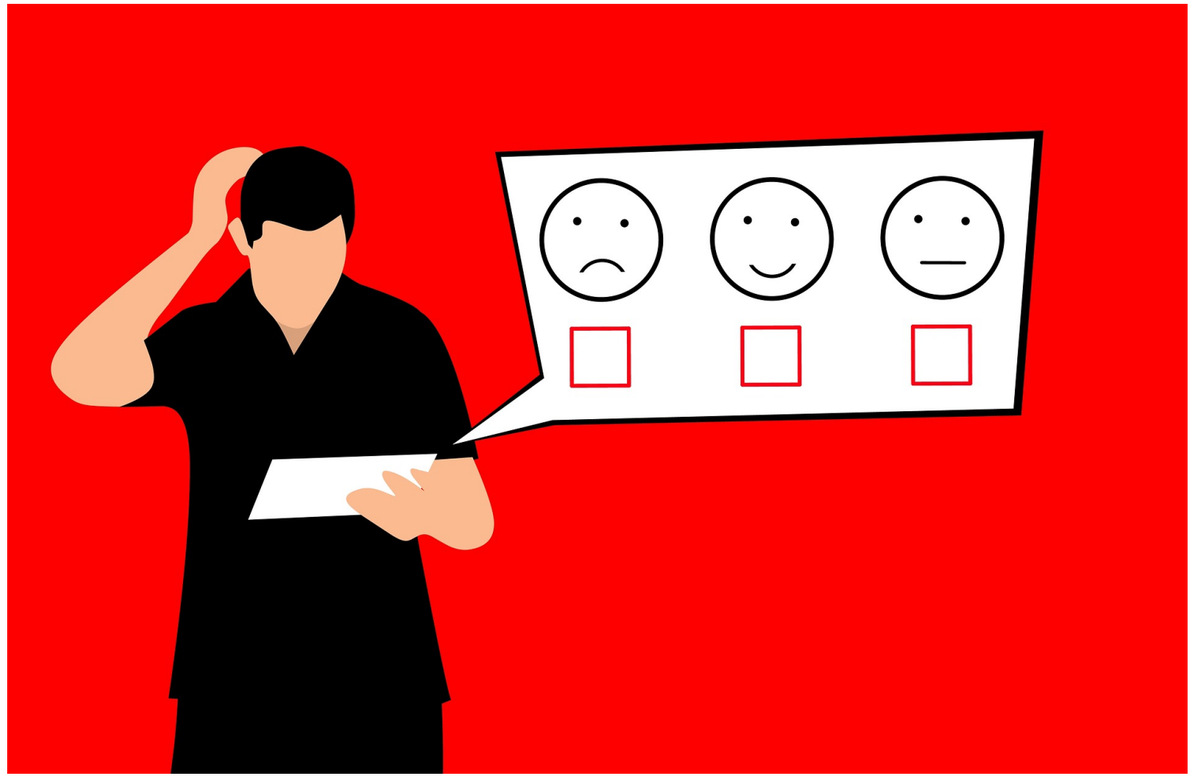
Examine customer survey data



- Data collection: qualitative interviews, online reviews, transactional data
- Use model to explain customer survey data

Survey inputs as a model

- Q1: *How satisfied are you overall [1-5]?*
- Q2: *How do you rate the quality of the product/service [1-5]?*
- Q3: *How do you rate the product/service options [1-5]?*
- Q4: *Do you agree that the offering is fairly priced [1-5]?*

	Q1 (overall satisfaction)	Q2	Q3	Q4
Customer-1	1	5	5	5
Customer-2	1	4	5	5
Customer-3	0	1	3	1
Customer-N	1	1	4	4
...	...	...	...	...

Survey inputs as a model

	Q1 (overall satisfaction)	Q2	Q3	Q4
Customer-1	1	5	5	5
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Customer-3	0	1	3	1
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...	...	...	...	...

- Target variable
  - Q1
- Explanatory variables
  - Q2, Q3, Q4

Explanatory models from customer data

	Q1 (overall satisfaction)	Q2	Q3	Q4
Customer-1	1	5	5	5
Customer-2	1	4	5	5
Customer-3	0	1	3	1
Customer-N	1	1	4	4
...	...	...	...	...

Logistic regression model

$$f(\text{overall satisfaction}) = \beta_1 * Q2 + \beta_2 * Q3 + \beta_3 * Q4$$

Sum of betas to understand impact

Logistic regression model

$$f(\text{overall satisfaction}) = \beta_1 * Q2 + \beta_2 * Q3 + \beta_3 * Q4$$

Model output

$$f(\text{overall satisfaction}) = 0.25 * Q2 + 0.25 * Q3 + 1 * Q4$$

Sum of betas

	Beta	Sum of beta	Proportion
Q2	.25	0.6	.42
Q3	.25	0.6	.42
Q4	.1	0.6	.16

Adding context with frequency

	Beta	Sum of beta	Proportion
Q2	.25	0.6	.42
Q3	.25	0.6	.42
Q4	.1	0.6	.16

Adding context with frequency

Adding the context of how often the organization does well in a category

	Beta	Sum of beta	Proportion	Frequency of a high score
Q2	.25	0.6	.42	.8
Q3	.25	0.6	.42	.35
Q4	.1	0.6	.16	.15


Sum of Betas Plot
Impact to Good Customer Interaction
0.1
0.2
0.3
0.4
0.5
options
quality
price
0.2
0.4
0.6
0.8
Frequency of Good Scores

Off to it!

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Wrap up

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Framework for data-driven decisions.

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

Apply your new found knowledge!

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