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1.3 Fundamentals of Statistics and DMAIC

MBC 638

Data Analysis and Decision Making

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Statistics provides the means to collect, organize, analyze, present and interpret numerical information in order to make more informed and effective decisions.

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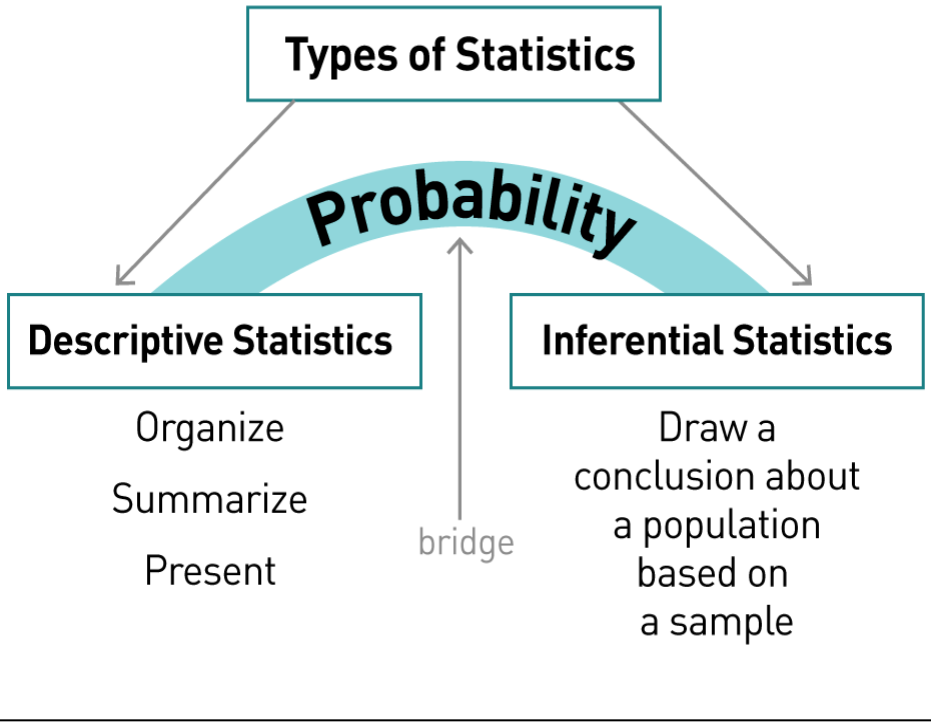

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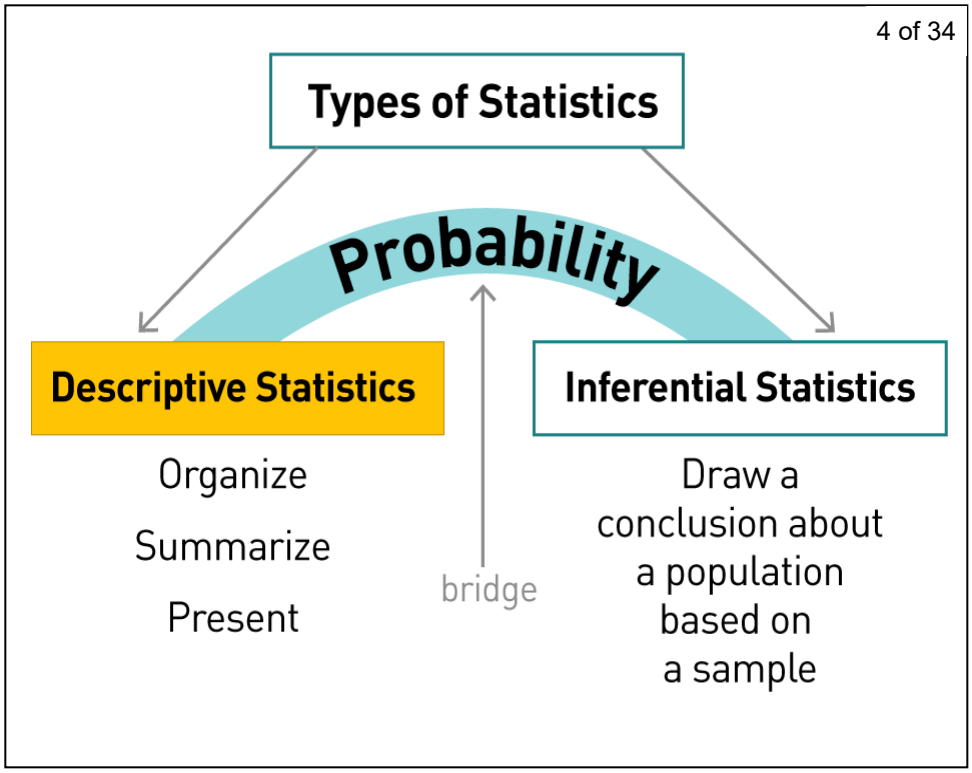
Types of Statistics
Probability
Descriptive Statistics
Inferential Statistics
Organize
Summarize
Present
bridge
Draw a conclusion about a population based on a sample

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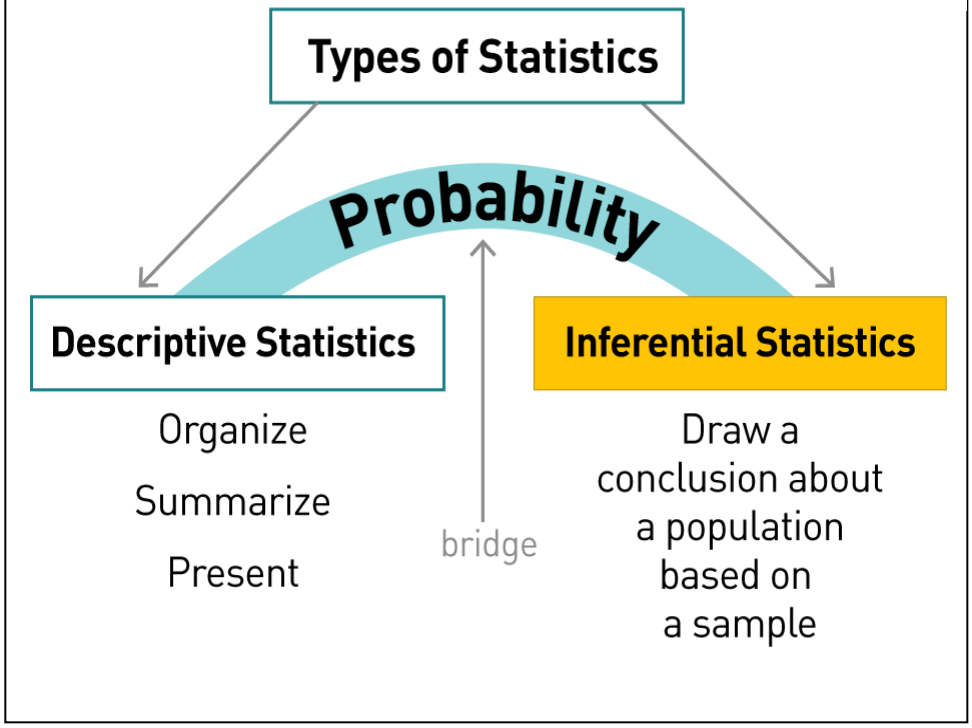
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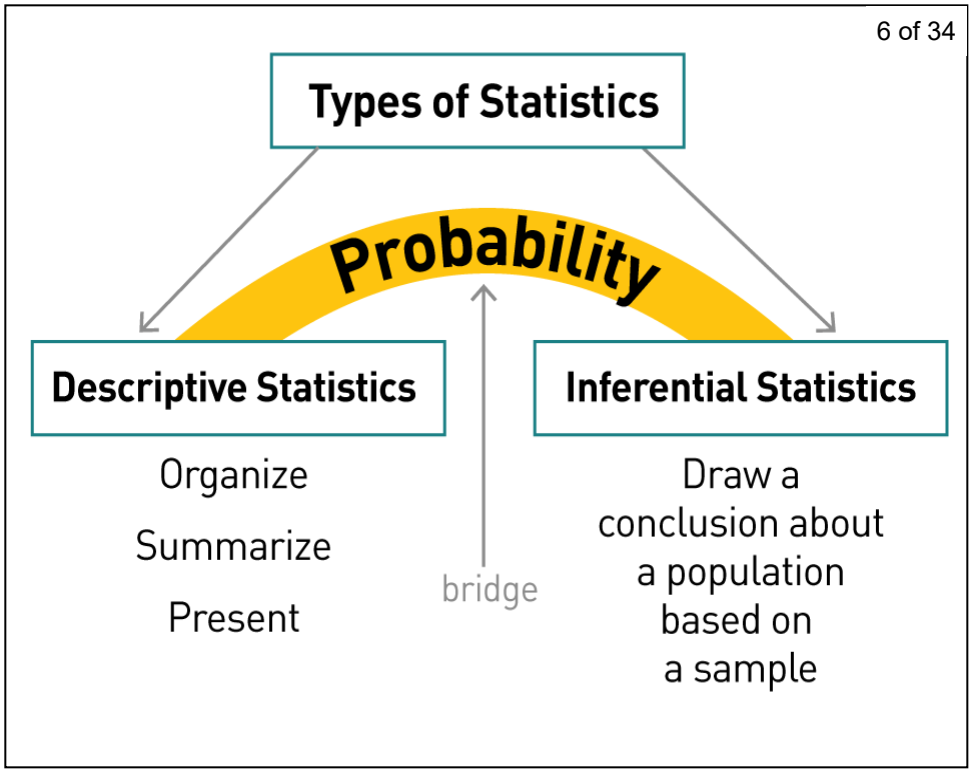
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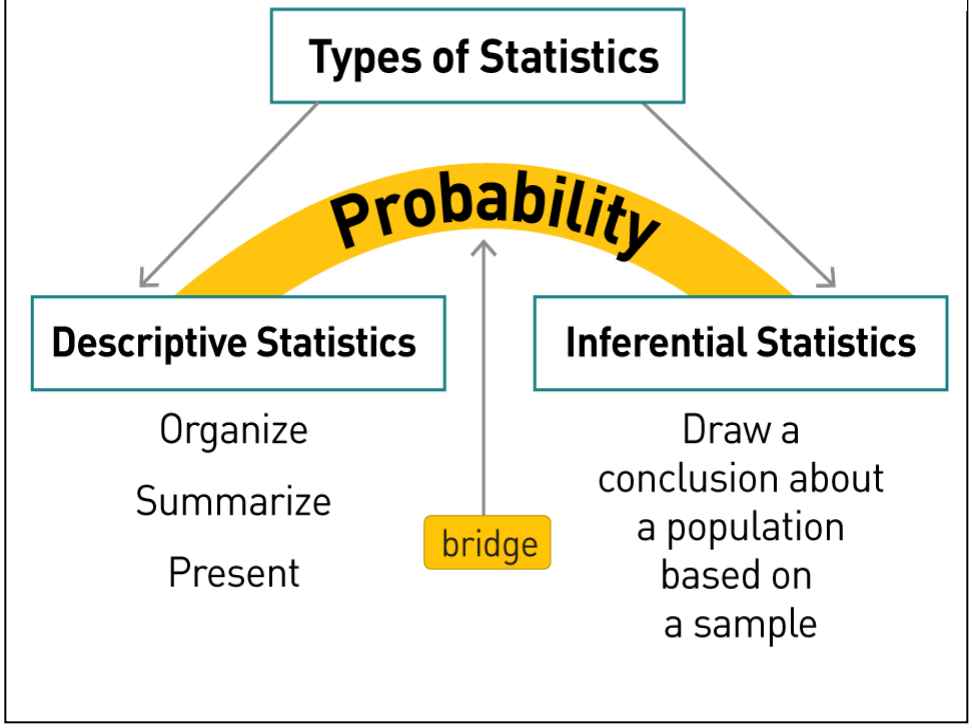
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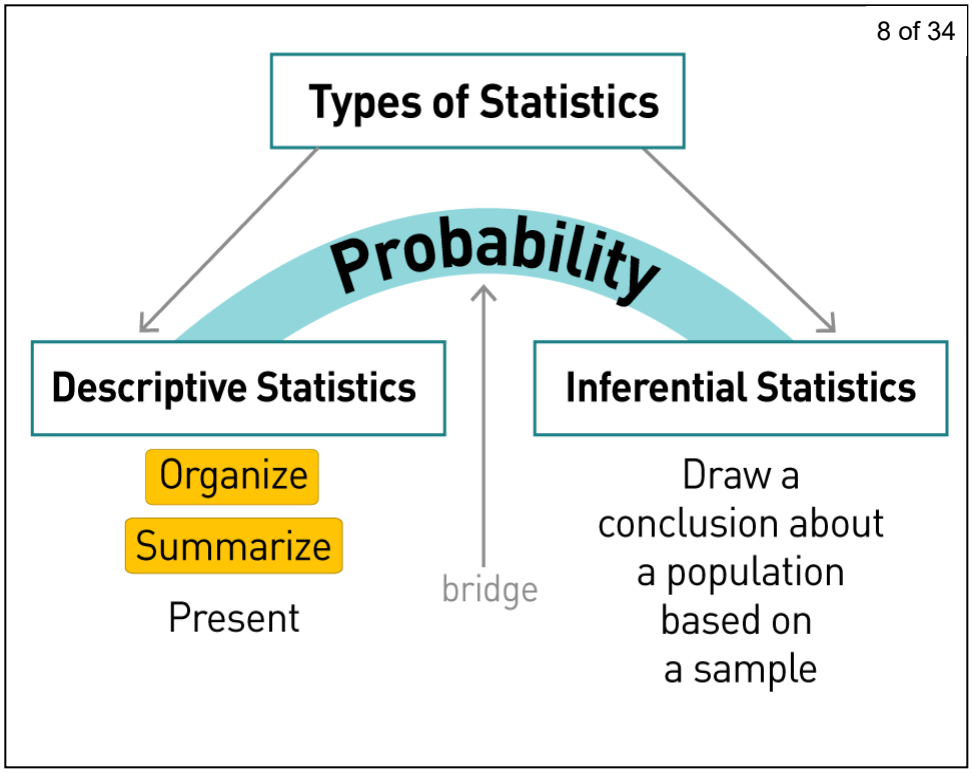
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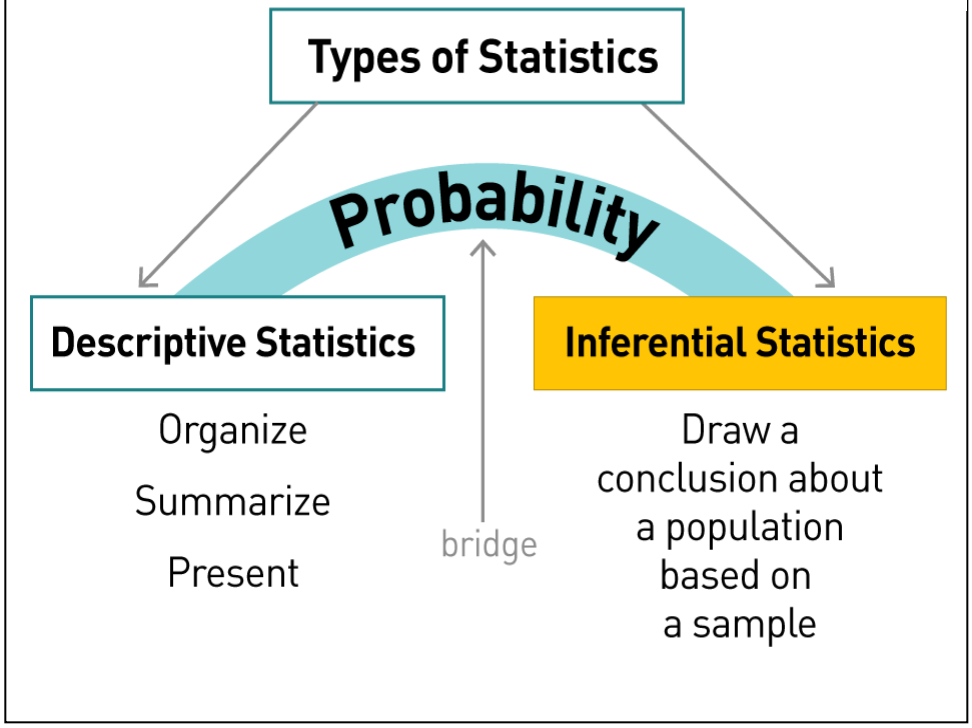
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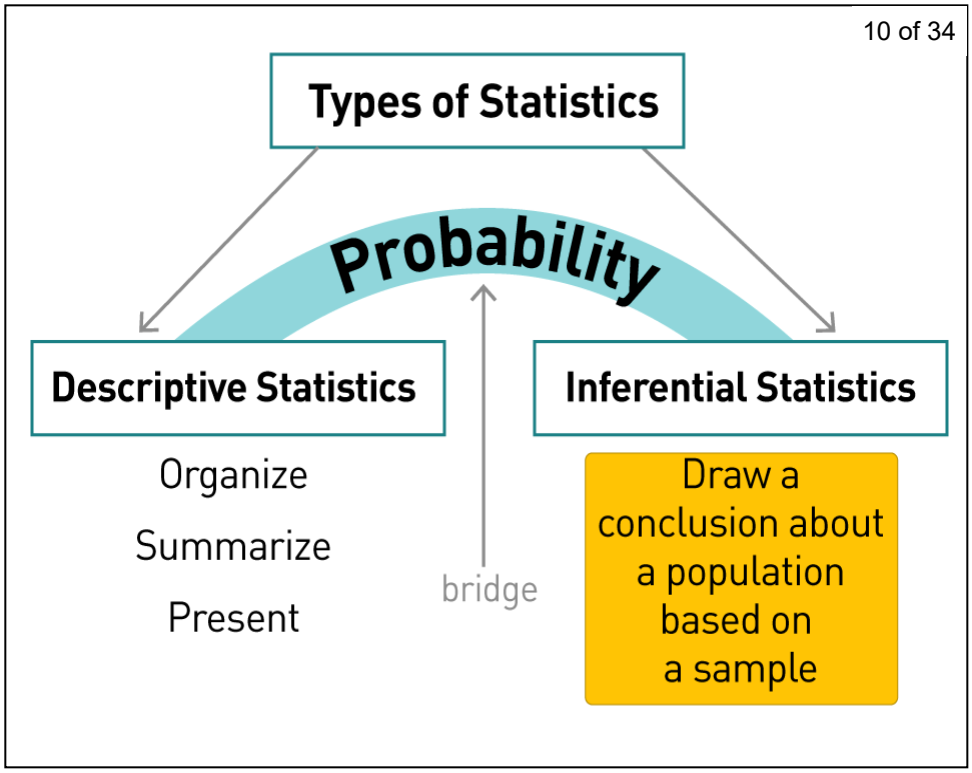

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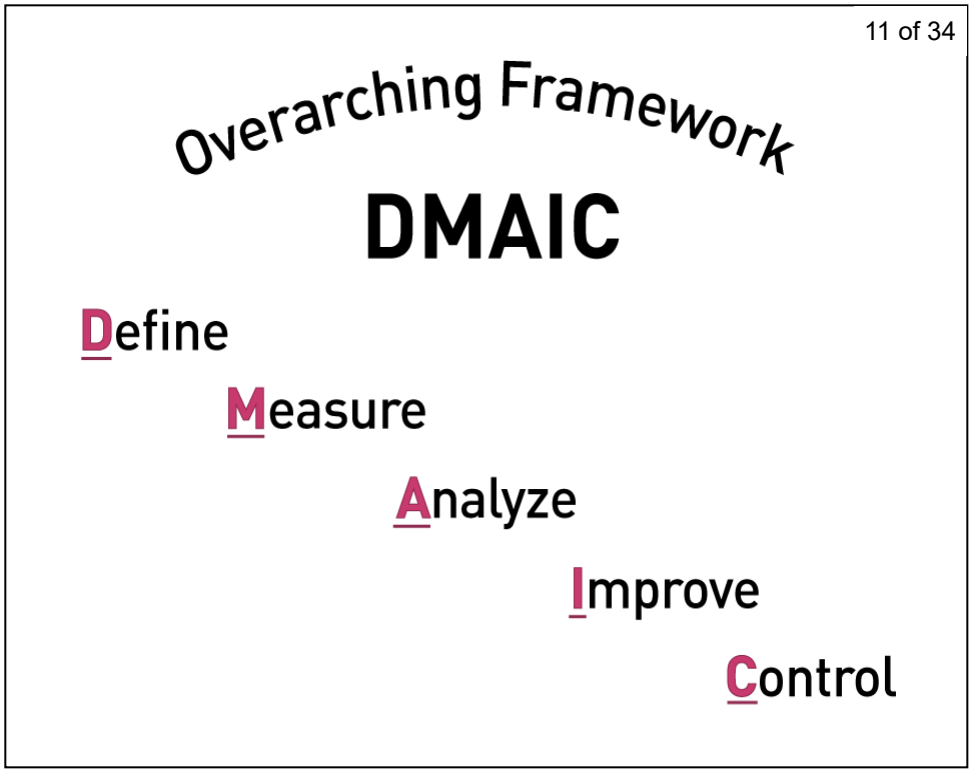

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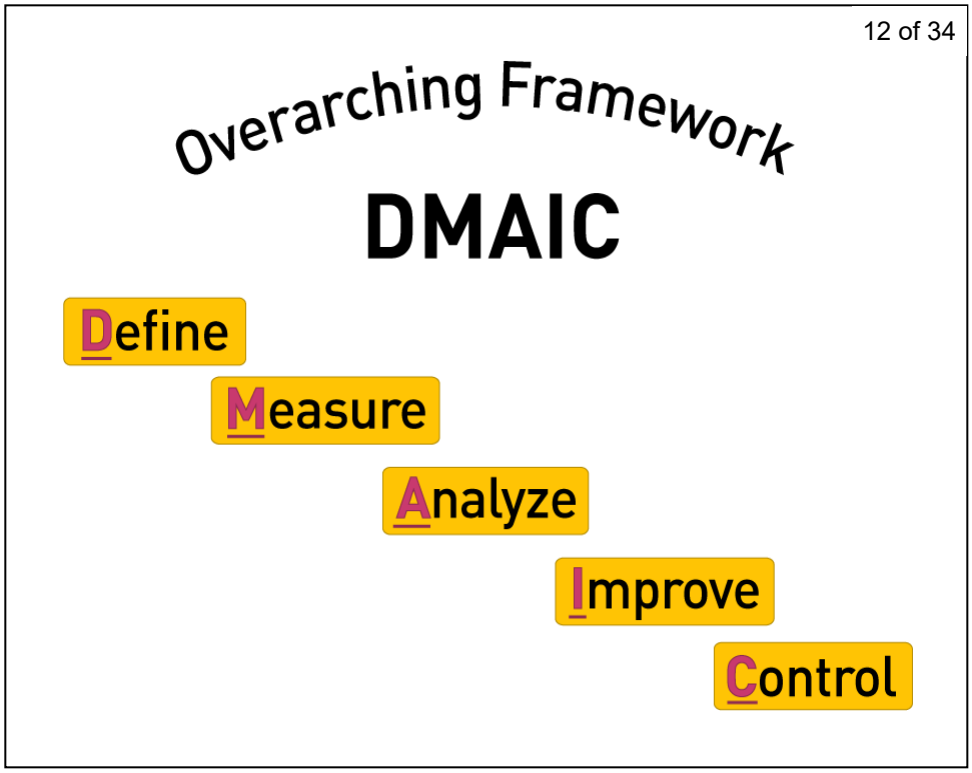

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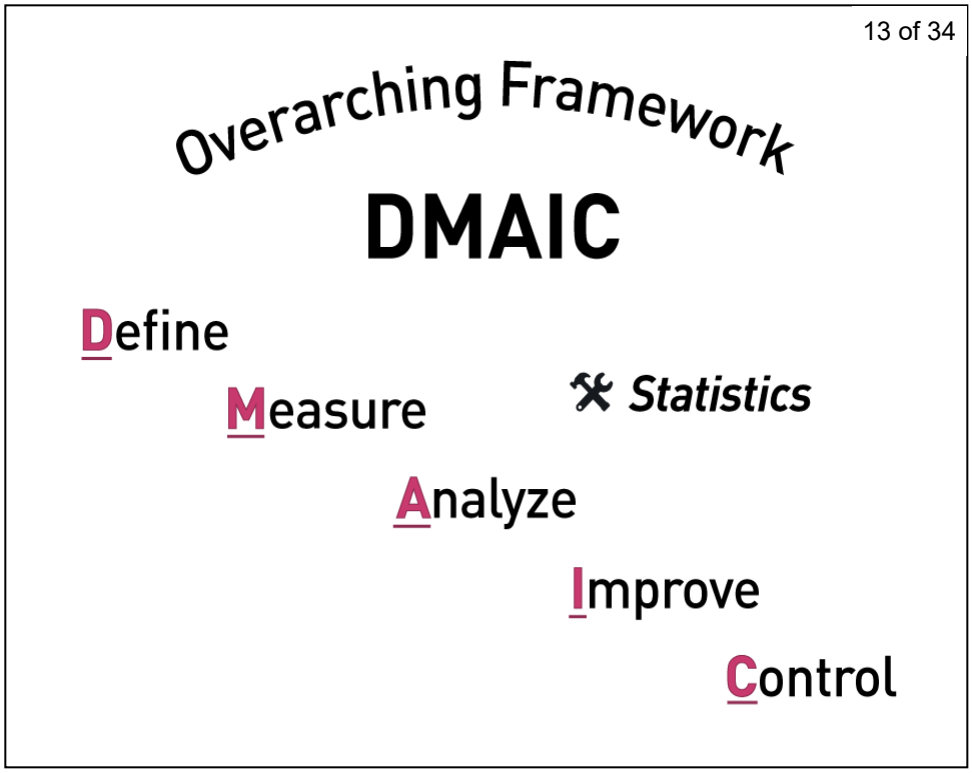

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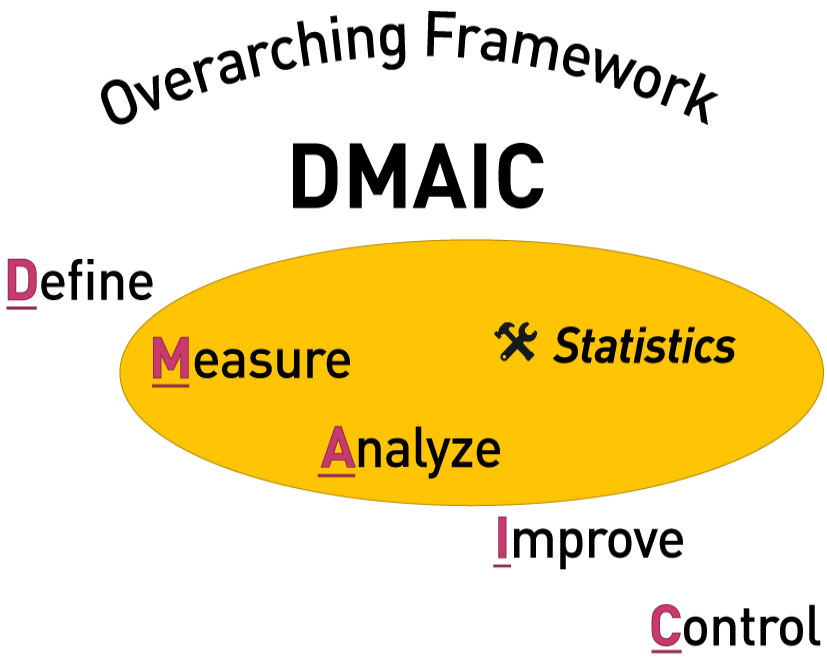

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DMAIC

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DMAIC

- **D**efine: Identify the problem and the team's scope.

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DMAIC

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DMAIC

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- **C**ontrol: Put a control plan in place; ensure the problem stays fixed.

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Discover… $Y = f(x)$

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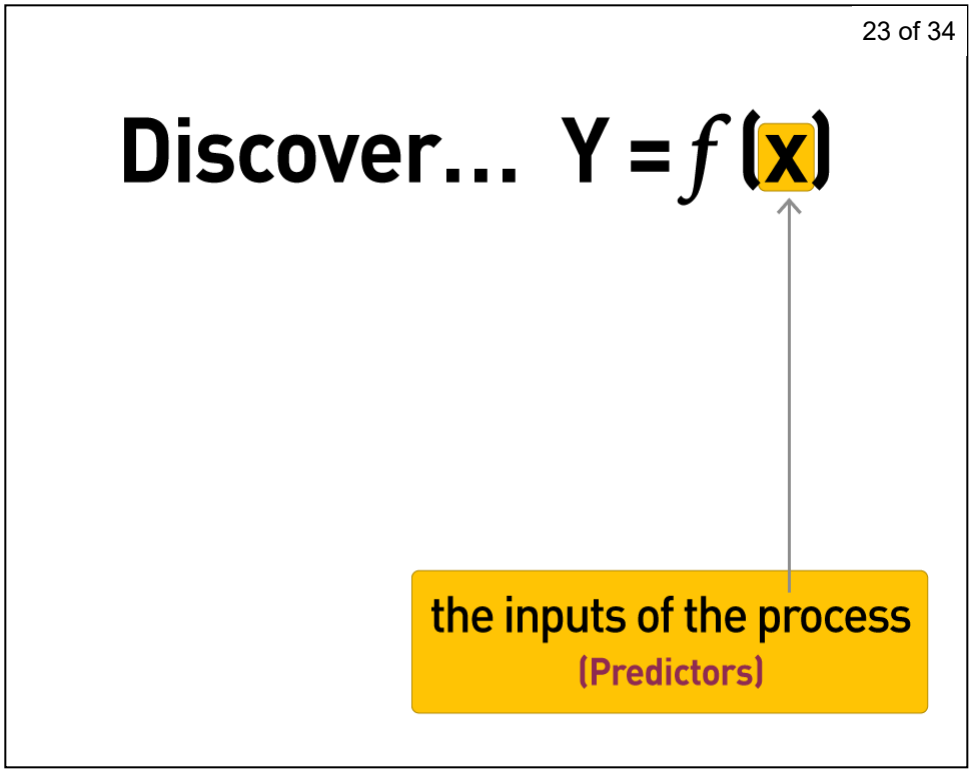

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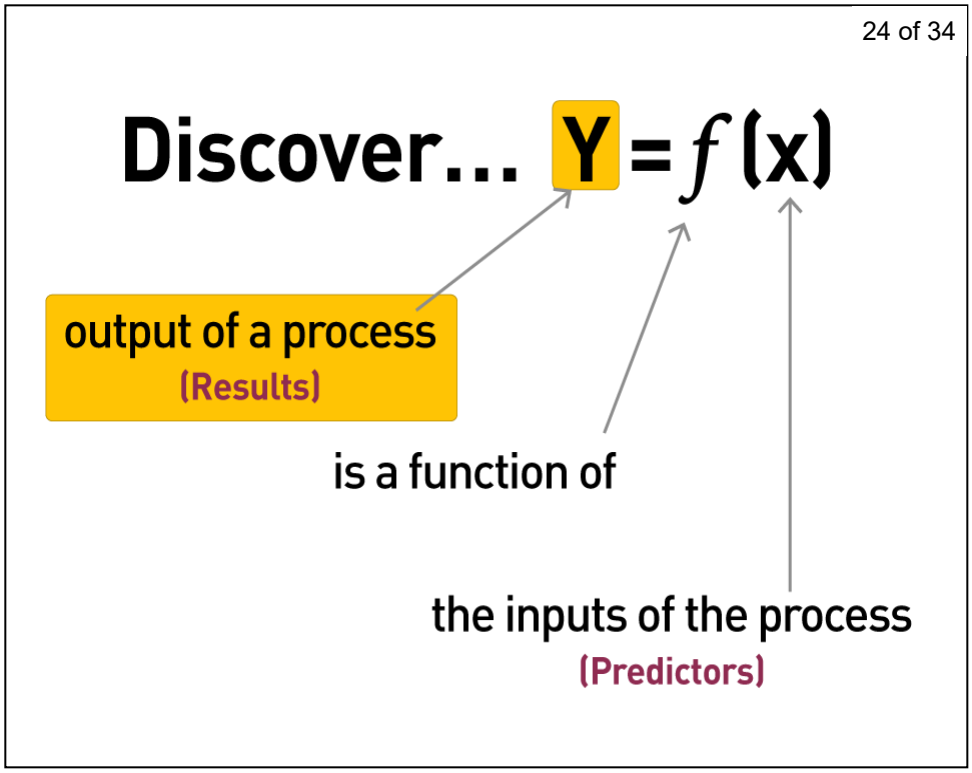

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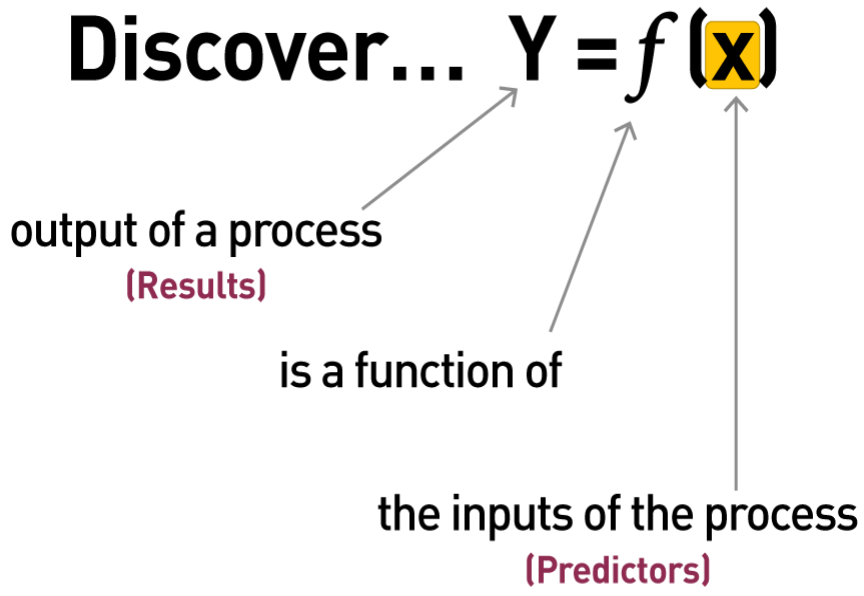

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Y = *f*(x): Example

$$Y = f(X_1, X_2, X_3, X_4, X_5, \ldots)$$

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- Y: travel time to school or work (output)

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- Y: travel time to school or work (output)
- Many factors (inputs) affect the resulting output

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$$Y = f(X_1, X_2, X_3, X_4, X_5, \ldots)$$

- Y: travel time to school or work (output)
- Many factors (inputs) affect the resulting output
  - X_1: distance

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  - X_1: distance
  - X_2: weather

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  - X_1: distance
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  - X_3: vehicle type
  - X_4: traffic
  - X_5: speed
- Goal: Select the key inputs and implement a focused solution.