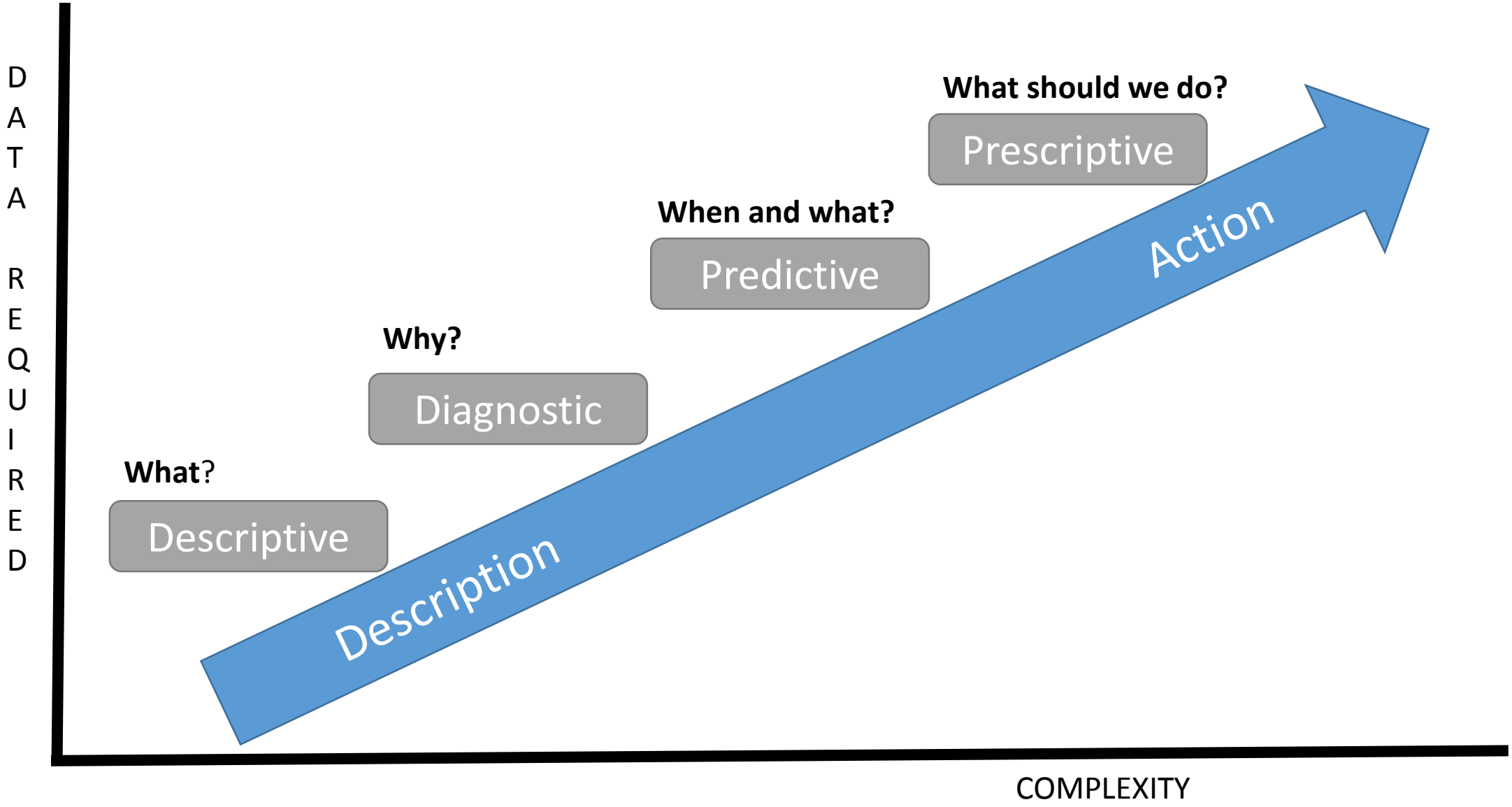
# ANALYTICS 101

# Data Mining Data Analytics

| Data Mining | Data Analytics |
|---|---|
| Retrospective | Prospective |
| Opportunistic | Designed |
| Cause/Effect free | Causal information |
| Pattern seeking | Insight seeking |

# Analytics are ‘theory’ driven

# Flavours of Analytics

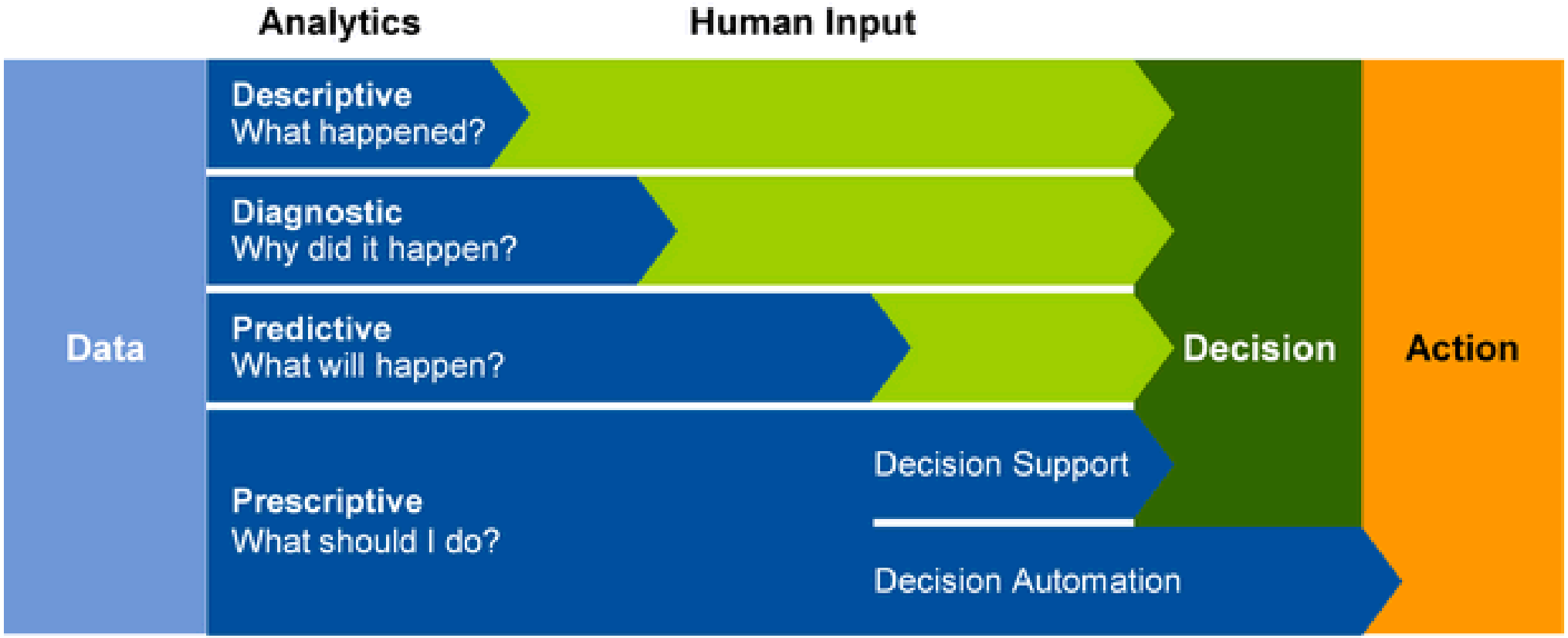


# What's happening with in each approach?

Descriptive Analytics: Counts, averages, %, min/max
Understand what happened in past

Predictive Analytics: y=mx + b
Knowing something sooner
Early warning system

Prescriptive Analytics: IF-THEN-ELSE
Adjustment on the fly
Supports Individualization


Analytics
Human Input
Data
Descriptive
What happened?
Diagnostic
Why did it happen?
Predictive
What will happen?
Prescriptive
What should I do?
Decision Support
Decision Automation
Decision
Action

# Operational Steps

# What is the purpose?

# Examples…

Understand processes within the curriculum

Experiences & outcomes of students

Evaluate elements or the whole intervention

Provide insight on future policy or evaluate policy change

# 1. What data will you need?

# Existing sources? Additional sources? New data collection?

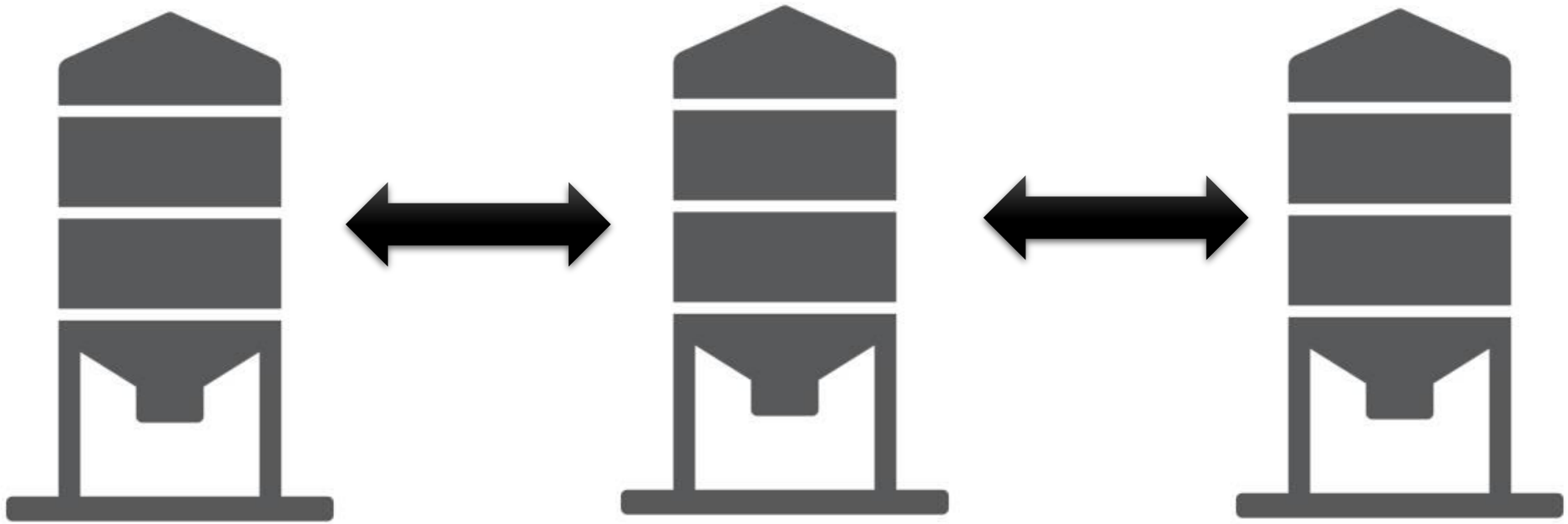
# Issues to consider

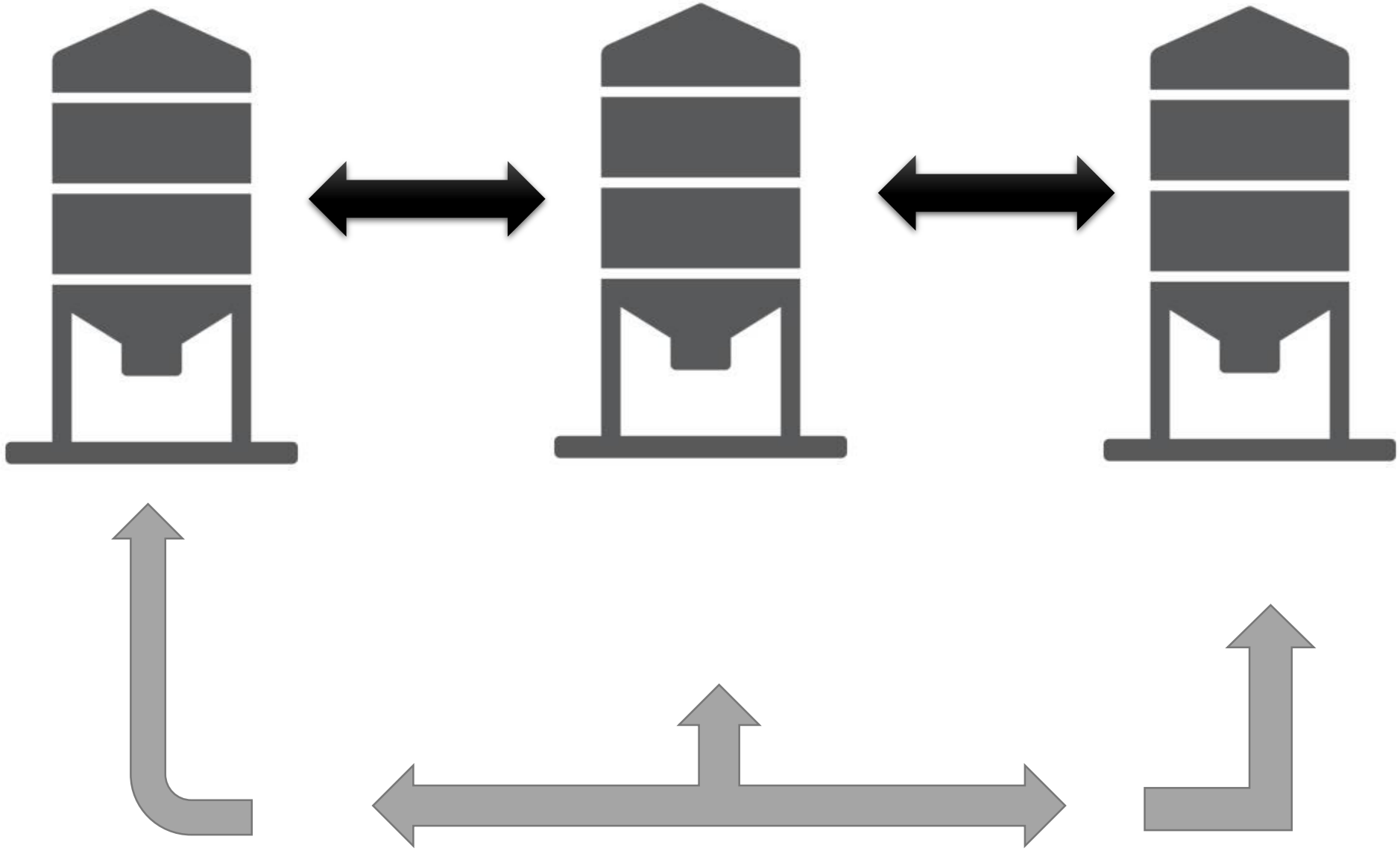
Data availability

Data quality

Data cleaning

Data security





# Some challenges

Connecting two different datasets

Data stored across databases without common links

Version control – old data won’t speak to new data

Data is available but export requires input from the vendor and changes to software

# New data on the block?

2. What type of ‘analysis’ is required? What type of visualization is required?

# Varied levels of complexity

Means and proportions

Associative analyses

Prediction models

Machine-learning and neural networks

This is not as hard as you might think…

# Visualization

Does it need to be visualized for your audience?

What’s the signal you need to ‘see’?

Interactive or static?

# SUMMARY REPORT

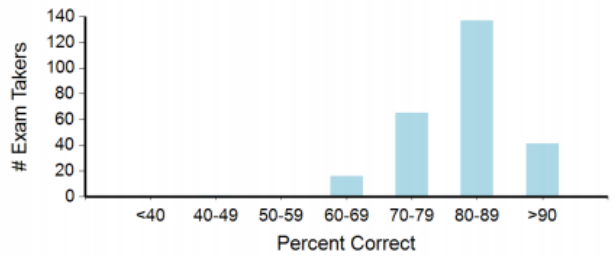
ExamSoft

*Course: 2T0 - 2018-19 • Instructor: N/A • 09/19/2016 • Q*

## ASSESSMENT PERFORMANCE

| 81% | 47% | 97% |
|---|---|---|
| Average Score (24.2/30) | Low Score (14/30) | High Score (29/30) |

**Total Student Performance Histogram**




**Assessment Score Reliability (KR-20)**

0.0 0.32 1.0

POOR SATISFACTORY GOOD

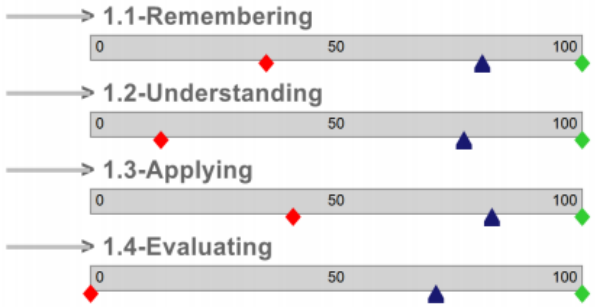
*Likelihood of students repeating the same performance.*

**Assessment Analysis:** Tests with reliabilities below .50 should be used with skepticism.

## LEARNING OUTCOMES *(Category Performance)*

Low Avg High

**01-Revised Bloom's Taxonomy**



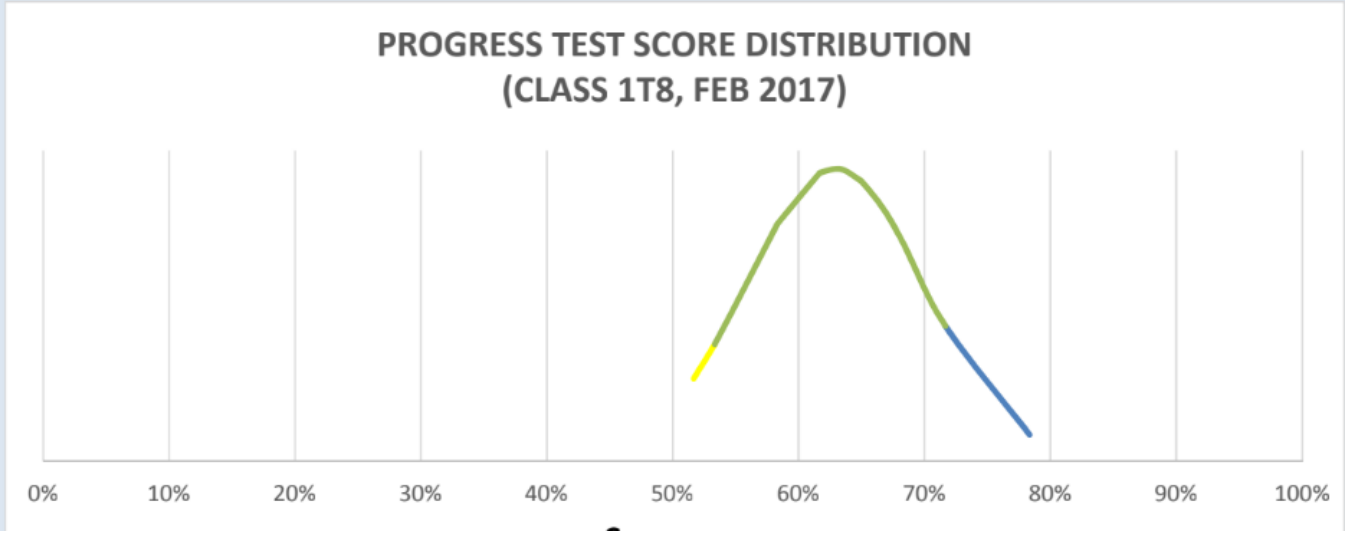
No. of Exam Takes of This Cohort: 15

## A. Student Information

| | |
|---|---|
| Student ID: | [redacted] |
| First Name: | [redacted] |
| Last Name: | [redacted] |
| Email: | [redacted] |
| Cohort: | Year 3 |

## B. Overall Results

| | |
|---|---|
| Your overall performance in this progess test is in Zone: | **Green** |
| Your score of this progress test is: | 53.3% |
| The class average of this progress test is: | 62.9% |



# 3. Interpretation

# Results vs. Conclusions

Theory

Stakeholders

Expertise

Validation

# Activity: Applying to your context

Report back:

1. What are your resources?
2. What are your barriers?
3. What do we need to overcome them?