

TURN DATA INTO INSIGHT, *INSIGHT INTO ACTION*

Professor Simge Küçükyavuz shares five tips on how to “translate” data and empirical information to fuel better decision-making and improve understanding.

At first glance, using data to drive decision-making might seem straightforward. Punch in a few numbers, look at the result, and act accordingly.

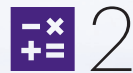
SIMGE KÜÇÜKYAVUZ warns it's not quite that simple.

Küçükyavuz, Chair and David A. and Karen Richards Sachs Professor of Industrial Engineering and Management Sciences, offers five insights on how to use data science to make robust decisions and help stakeholders understand them more readily.



Embrace the Messiness and Visualize Early

Real-world data are rarely “plug-and-play.” Often, they are incomplete or noisy. Before beginning to analyze such data, visualize using charts or maps to identify outliers and missing entries. This ensures that data make sense and provide a solid foundation for any decision.



Remember, a Mathematical Model Isn't a Complete Representation

Avoid using data tools blindly. Understand and interrogate the underlying assumptions of any tool, whether it's a simple regression model or a complex mathematical model. The adage that “all models are wrong, but some are useful” helps explain the specific contexts where a model can be applied and where its outputs might be practical enough to work.



Quantify Risk and Map Uncertainty

Every data-based decision involves some level of risk. Instead of a single “best” number, use data to define a range of possibilities and quantify the risks of different paths. Incorporating confidence and predictive intervals, or “error bars,” ensures decision-makers can choose a level of risk they're willing to tolerate.



Master the “What-If” through Scenarios

The best decisions are robust: they remain sound even if the future plays out differently. Use “what-if” scenarios to test how much circumstances must change before a different solution is required. If a small change in a data point flips the recommended action, the decision requires more scrutiny.



Translate Data into Human Context for Stakeholders

Most problems involve complex human behaviors that data and mathematical models alone cannot capture. Using specific examples, translate technical methods into clear language that decision-makers can understand. Visualizing and explaining the “why” behind an output helps stakeholders understand the model and make fully informed decisions.

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