

: *What are challenges for predictive analytics?*

Daniel J. Power

Editor, DSSResources.COM

Prediction is a difficult task and a challenge in many situations. The assumption of current prediction tools is that historical and current data can be used with quantitative models, and in some cases with the addition of human judgment, to accurately "predict" future conditions and outcomes. The past is in some situations an acceptable and accurate predictor of the future, but there are real challenges and limitations that must be understood. Challenges include:

1. Falling off the metaphoric data cliff.

A data pattern abruptly ends and then any prediction would be very inaccurate. Analysts and managers must constantly monitor discontinuities that impact data series. Falling off the metaphoric data cliff is generally irreversible.

2. Entering a slow data spiral of death.

The data and model become less and less predictive over time and human observers or statistical tools do not identify the increasing errors before serious errors have had a large impact on organization performance. A data death spiral is a downward, increasingly inaccurate result where the error gets increasingly bigger. Monitoring prediction accuracy must be an ongoing task.

3. A widening data circle of prediction despair.

Widening variance in predictions is observed, but the cause of the error and a solution to adjust the prediction is not identified soon enough and managers feel helpless to correct the error. The despair grows, the forecasts become meaningless. Increasingly bad results harm organizational performance. Despair can lead to desperation and desperate, even irrational, actions.

4. Taking a data staircase to hell.

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A data trend had been steadily predicting growth and success for months or years and then the trend is more like a stair downward. Perhaps the trend shows a gentle slope or perhaps it is more like a down escalator. A change in the data pattern is observed, but analysts and managers keep hoping the changing is temporary. An optimism bias distorts the analysis.

5. A prediction explosion or implosion.

A trend and model predict excellent outcomes, and then the predictions are proven unrealistic. Negative outcomes from overly optimistic investment decisions and exaggerated expectations then lead to financial ruin.

6. Data dilemmas and dirty data.

Analysts do face difficult choices about the appropriateness of data and the quality of data. Pundits may argue that some data is better than no data, but in reality bad data is much worse than no data. Resolving and monitoring data and prediction challenges is important and even crucial. Metaphors present a simplification of a problem from a specific viewpoint, but they are often memorable and can help people understand novel and complex topics like using data for prediction.

The future is yet to occur. It is unknown, but we can make good guesses in some circumstances. Know the challenges of predictive analytics, be on the lookout for them, and be proactive in addressing them. Prediction "ain't easy" or everyone would be rich.

Author: Daniel Power

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