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The prediction predicament

By William "Ike" Eisenhauer

Forecasting is an ungrateful profession.

Many times engineers working in the healthcare sector are called upon to provide models that forecast or predict activity to optimize resources. As engineers we tend to want to use those techniques and methods that will provide the best and most accurate predictions.

The problem is we also are treated like the "weyward sisters" of William Shakespeare's tragedy "Macbeth."

As you might recall, the first time the witches enter Macbeth's life and give answers, Macbeth, while apprehensive, tends to be happy because they give him good news. His doubts about their abilities fade, and he plans his ascension to the throne.

However, the second time, the news is not so good, and he brushes them aside and takes a more optimistic view of things than the actualities the witches provide.

This is the folly of forecasting things that no one really wants to know.

In a similar vein, health systems engineers use methods that are a bit more scientific than the nonsense chanting of "Double, double, toil and trouble ..." and the whole "eye of newt and toe of frog" business, but to most nontechnical executives it sounds about the same.

This, again, does not really seem to matter, at least until you are wrong – or more correctly, the method produces an inaccurate forecast.

"Was it three toes and one eye? Or one toe and two eyes? Ah, yes, it was the loaded overhead estimate that was

fed incorrectly to the AMARA time series prediction BIC model selection criterion module that was the source of the problem."

Upon uttering this during your visit to the boardroom, of course, you receive a wall of blank stares.

This is the folly of using methods that are too complex for the end user to diagnose. If you are forecasting things that no one really wants to know (folly No.

Knowing where and how the forecast missed its mark is just as important as heeding its news.

1) and the end user can't figure things out (folly No. 2), you will not succeed.

You typically can avoid the first woe by asking a hard question ahead of time. Do you have an action plan in place that depends on the results of this forecast? If there is not one, then there is no need for the forecast because no one wants to hear it anyway.

In the case of the second, it is a reality of forecasting in healthcare operations (as opposed to the dealings of kings) that one who is responsible for the actuals not adhering to a forecast must be able to explain why. If your audience cannot comprehend the methodology, limitations and causal chains in a forecast in order to match them up with actual performance parameters, they are left in the

precarious positions of stating either "I have no idea" or "I do not understand how the forecast is made." They need to know why it has to be an "owllet's wing" in the cauldron and not just any old bird appendage.

This is a risky position to be placed in. It is not a lack of awareness or availability of the latest techniques and predictive methodologies; it is purely a risk mitigation strategy. Knowing where and how the forecast missed its mark is just as important as heeding its good and bad news, with just enough "blind-worm's sting" to take action if the prediction is not what you expected.

As engineers we need to be cognizant of these follies and realities when we introduce our models, techniques and forecasts to provide the most valuable, useful information in an understandable manner. ❖

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