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Hubbard Decision Research

Getting Software Selection Down To A Science

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In a recent interview, SCDigest editor Dan Gilmore gave me the opportunity to explain a little bit about "Applied Information Economics" (AIE). AIE is the method I developed about nine years ago which applies advanced financial and statistical modeling methods to risky technology investments. I've known Dan for a few years and always found him to be a good proponent of more sophisticated quantitative methods. When he suggested I contribute to a regular column, I took the opportunity as a way to discuss AIE in depth within the context of Supply Chain Management.

I've used AIE now on a total of 44 distinct IT investments over the last nine years in 22 separate organizations of all types. I've also done larger "AIE Implementation" projects - where the company adopts AIE as a standard process – in five organizations. I've written about using more quantitative methods in various periodicals but, so far, I haven't written much about what I've learned from all those projects. To me, each one is like another sample in an ongoing experiment. I collect the data and track the findings over the years.

AIE, in part, utilizes what is called a "Monte Carlo" simulation. Monte Carlo simulations generate thousands of scenarios according to the defined probabilities for all the uncertain variables in the business case (e.g., just about all of them). But AIE adds more than the traditional Monte Carlo simulation. First, we actually train people who provide the probabilities to be "calibrated" when they assess odds for uncertain things. This means that when they say they are "90% certain" they will be right 90% of the time. Second, we compute the monetary value of additional information and use the results to guide further measurements. No, really. There's a formula for it. Finally, we use the results in some fairly sophisticated "portfolio optimization" calculations (in fact, Nobel Prize winning methods) so that the investment portfolio gets the best risk/return position. When we apply this more robust approach to IT investments, we find several interesting things. In no particular order, here are a few things that using more advanced quantitative methods have revealed about technology decisions:

1. There are no intangibles. I haven't found one thing yet that can't be measured or calculated. Several things may have initially looked intangible to somebody. But we always found a way to observe it and express it quantitatively. Hint: "It's an intangible" really means "I can't think of a way to measure it right now". This applies specifically to the "soft benefits" often discounted in supply chain ROI estimation.

2. Computing the actual economic value of information has profound effects on what we measure and how we measure it. There is actually a 50 year-old formula for the value of information. I use it extensively in every one of my projects. And I find that most organizations measure what they *know how* to measure, not what they *should* measure. Test: What do you spend more time measuring: costs or benefits? What's more uncertain: costs or benefits?

3. Considering risk significantly affects how much ROI is “good enough”. It is possible to perform a quantitative risk analysis similar to what an actuary does for insurance. When we apply these methods we find that risk is often a larger differentiator among IT investments than ROI. When compared to market-driven risk adjustments, we find some projects are so risky that a 100% ROI would be required at a minimum to justify the investment. Chances are, if you have a large technology portfolio, you have some investments just like that.

4. More sophisticated methods are very practical. The statistical methods required can be taught to analysts and the output can be understood by management. “Complexity” is relative. Sophisticated engineering and statistical methods are used every day in organizations all over the world. Yet, most automotive CEO’s are not automobile engineers and most insurance company CEO’s are not actuaries.

I could list a lot more but these are probably the most important findings. Not only do they tend to rank high on the “somewhat surprising” scale, but they can get you to start thinking about quantitative analysis in a way that may influence how you assess future IT investments. In each of the future columns, I will discuss some of these in more detail as well as introducing and discussing other methods and findings. Stay tuned.

Hubbard Decision Research is home to the creator of "Applied Information Economics" and is the most capable firm on the market specializing in the economic analysis of Information Technology. For more information, visit www.hubbardresearch.com.

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