Beyond ROI: Value Management

By James M. Kurz

Abstract

Organizations must change in order to remain competitive. Carr in his 2003 article entitled, “IT Doesn’t Matter”, states that IT has become a commodity and therefore no longer matters [3, 4]. Have technologist forgotten that as a business partner they must demonstrate the value of IT? Perhaps incorporating a value management strategy would improve the IT commodity image into that of value enabler. The objective of this paper is to study value metrics and methodologies to understand why IT value is not being valued correctly. In this regard an investigation of literature regarding value will be conducted that will result in the definition of value along with strengths and weaknesses of valuation in order to provide insight for future value restructuring and continued research in this area.

Introduction

An uproar in Information Technology (IT) circles resulted in thought leaders in IT to refute Carr’s article that IT Doesn’t Matter [4]. In his article, Carr presented his thesis that IT has become a commodity that no longer provides strategic advantage [4]. Business managers have long been after IT to align technology with business. In response to business needs IT has stepped up their alignment efforts and is using hard-dollar metrics such has net present value and internal rate of return to consistently demonstrate the business value IT investments are expected to yield. However, one might ask after all of the nonstop investments, where all of the projected savings and revenue growth that were supposed to have been brought on by IT are [26]. Overall it appears that the real issue here is a failure to demonstrate the strategic advantage by not just forecasting value but by receiving it. Perhaps incorporating a value management strategy would improve the IT commodity image into that of value enabler.

The objective of this paper is to study value metrics and methodologies to understand why IT value is not being valued correctly. In this regard an investigation of literature in the area of value metrics and methodologies are reviewed in order to provide insight for future value restructuring and continued research in this area.

Case Study

An SAP system was operational for 37 months. Since that time the database grew to a level that was so large that system performance was being adversely affected. The method used to alleviate this problem was to add more disks at a cost of $50,000 (starting next year). This would become an annual cost if archiving methodologies are not implemented.

In addition, the company maintained other data that was not transferred to the SAP environment prior to G0-Live. There is a routine need to retrieve some portions of the legacy data to compare prior performance and profitability. There was also a need to be able to maintain and retrieve legacy data in case of liability or tax question. Currently, the maintenance cost for this server is approximately $4,000 per year. They were not able to eliminate that expenditure since this server was also required to operate other database applications. However, they were able to avoid future costs of approximately $8,000 that was associated with adding additional disks for the other databases once the other data has been removed from the system.

The Objective of this analysis was to present the strategy for the management of critical data that is required by the company to manage historical data, improve system performance, and improve the efficiency of their administrative staff. Based upon the preceding information of Costs and Benefits, the following were some of the Key Financial Ratios that are associated with this project:

<table>
<thead>
<tr>
<th>Area</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Investment</td>
<td>$122,000</td>
</tr>
<tr>
<td>Total Depreciable Investment</td>
<td>$115,000</td>
</tr>
<tr>
<td>Useful Life – Standard IT Assumption</td>
<td>3 years</td>
</tr>
<tr>
<td>Annual Running Costs (Maintenance agreement)</td>
<td>$5,000</td>
</tr>
<tr>
<td>Annual Cost Savings (5K&lt;6K&lt;30K)</td>
<td>$75,000</td>
</tr>
<tr>
<td>Simple Payback (years)</td>
<td>1.5 years</td>
</tr>
<tr>
<td>Net Present Value (NPV)</td>
<td>$296,000</td>
</tr>
<tr>
<td>Internal Rate of Return (IRR)</td>
<td>7.9%</td>
</tr>
</tbody>
</table>

The recommended solution was to install EASY-ARCHIVE archiving software that would facilitate the removal of nonessential SAP data from the system but would simultaneously permit the data to be retrieved and viewed if and when it was needed. This benefit would result in savings of approximately $50,000 per year in avoiding the cost of purchasing disk storage (starting next year). In addition the archiving
software would be used to archive the legacy data from the other systems, which results in a cost savings of $8,000 per year. Finally, the recommended solution would increase system performance and improve daily operations by using new optical scanning technologies for filing and retrieving external documents. The labor saving due to the result of improved efficiencies was estimated to be $20,000 per year.

The case study utilized four value methods return on investment, activity based accounting, net present value, internal rate of return.

**IT Value Defined**

The Oxford English Dictionary defines value as "the relative status of a thing, or the estimate in which it is held, according to its real or supposed worth, usefulness, or importance" [24]. When discussing the value of product it reflects the owner(s) or buyer(s) desire to retain or obtain the product [17]. Value is a measure expressed in currency, effort exchange, or on a comparative scale which reflects the desire to obtain or retain an item, service or ideal [7]. Value can also be defined as the fair equivalent in service or commodities that an owner or buyer receives in exchange for money [5]. Economists define value in terms of environmental interactions, choices, and preferences that emphasize the person holding values [6, 15]. By extrapolating these definitions to IT, the value should therefore be an estimate of an IT system’s actual worth, usefulness, or importance. Such a definition does not indicate from what perspective worth, usefulness, or importance is established and does not preclude the possibility of multiple perspectives. Shapiro and Varian provide insight into how this judgment is formed, describing IT as an "experienced good, where the true value of the good cannot be revealed until it is used because it is context dependent" [21]. Therefore, the perception of IT value is a subtle phenomenon which is often subjective and can be easily challenged [22].

The perception of IT value eludes most companies. As shown in this study by CXO Media survey results regarding IT value, only 30% said that IT was viewed as a value center at their company and the remaining 70% felt IT was still viewed as a cost center. When asked how frequently they meet with other executives in the company to discuss or demonstrate IT value, 31% answered monthly and 26% indicated that they meet quarterly. 7% said the meet with other executives twice per year 9% met annually. 16% said they never meet with other executives in the company to discuss IT. 7% did not answer or listed "other" [16].

Unfortunately, value is used as a term that is featured in a conversation as evidence of the importance of one’s efforts, often without a clear, consistent meaning [20]. The picture gets even murkier when you take into account all the metrics and methods in the field of financial valuation that claim to capture this mysterious thing we call value: payback method, discounted cash flow, real options method and the like, as well as external indicators such as the stock price. For an IT staff member trying to assess value with no prior financial experience it can be a confusing mess.

**IT Value Measured**

Exactly how to measure IT value, also seems to elude most companies as shown in this study by CXO media survey results regarding IT value. When asked about the metrics or methodology used to measure IT value, respondents listed return on investment (ROI) most frequently (41%) followed by total cost of ownership (TCO) (29%) and internal rate of return (IRR) (14%), in that order. When asked which factors were included in value equations, respondents listed costs and expenses (85%), productivity (67%), external customer satisfaction (55%), soft benefits (48%), uptime (46%), and revenue (45%) most frequently [16].

Thornton argues that in today's don't-blame-me, blame-my-metrics world of non-accountability; one receives little argument when lamenting that "Generally Accepted Accounting Principles (GAAP) measure the wrong stuff" [25]. He further postulates that people from all parts of the organizational village agree that GAAP does not appropriately measure or value speed or velocity (e.g. time-to-market, time-to-full-value usage, customer responsiveness), it does not measure smart (e.g. what you know or who you know or how fast you learn), it does not measure happy (e.g. employee morale or customer satisfaction). In the world of electronic commerce, under-serviced customers quietly click away, never to return. Additionally, GAAP does not measure the critical dimension of connectedness (e.g. how easy is it to do business with you or how appropriate and well-executed...
your channel strategy is or the quality of your relationships).

While the majority of IT executives feel that measuring IT value is an important priority very few have confidence in the reliability of their value measurements. The IT value measuring problem is ubiquitous as IT leaders avoid tackling the intangible. The real issue is that there is a misunderstanding regarding measurements: the object being measured is not understood, the concept or the meaning of measurements is not understood or the methods of measurement are not understood. In order to improve our understanding in this area an investigation of literature regarding measuring value was initiated. The following represents a limited number of the models, which can be used to calculate value within the areas of: Payback Method, Discounted Cash Flow, Economic Value Added, and Real Options Analysis.

**Payback Method (PBK)**

Return on Investment (ROI)

A survey conducted by Bacon indicated that 61% of the sample companies used a payback method. CIO Focus performed a study ten years later that identified 41% of its respondents still use the PBK method [1, 16]. Although, much has been written to suggest that PBK is an excellent measure when the costs and benefits of project are tangible [8], simply put this methodology ignores the time value of money, as well as any cash flow following the payback period. Also, there are costs and benefits to an IT project that are intangible. Using this method would not show the intangible items.

A well-known payback method is the return on value (ROI) measurement. Usually this is the key metric when performing a cost benefit analysis. ROI calculation is straight forward and is the ratio of the cumulative net gain (cNG) from a proposed project, divided by total costs (TC):

\[
ROI = \frac{cNG}{TC}
\]

ROI is an excellent measure of when costs and benefits of a project are tangible [8]. Unfortunately, most investment projects include intangibles that are not recognized in this calculation. The bottom line is that ROI is no longer appropriate. Any company relying on traditional accounting to pass judgment over information technology investments will overspend, misspend and under-deliver, while less methodologically hampered investors will be “eating your lunch” [24]. McShea concurs that using traditional ROI and purely financial metrics only is not sufficient enough to characterize project value [11]. During the literature review it was identified that ROI represented a calculation or methodology. This subtopic represents the return on investment calculation. However, it should be noted that an ROI methodology will be mentioned in the value management section. In the case study example the ROI was calculated to be 60.8%. Providing this figure is higher than the company's cost of capital which in this case was 12%, and there are no better investment opportunities for those funds, this may may make sense to move forward on this initiative.

**Discounted Cash Flow (DCF)**

Net present value

NPV aims to show an inherent contribution of IT investment to profitability. It compares the expected annual savings, minus initial capital and expenses incurred annually, over the investment’s expected life. NPV equates future cash flows to their current value at the discount rate, a percentage rate that a company applies based on alternative investments they forego or a desired rate of return (if they borrow the funds).

The equation for NPV is where \( CF \) is cash flow, \( x \) is the year the cash flow is realized, and \( n \) is the number of years the system will be in operation [14].

\[
NPV = \sum_{x=1}^{n} \left[ CF_x \times (1.00 + \text{discount rate})^{-x} \right]
\]

Net present value is especially important because it establishes the magnitude of the expected return in today’s dollars [8]. However, because NPV estimates do not consider the value of the opportunity for managers to intervene across the projects trajectory, they under evaluate ongoing projects actual value to the firm. In the case study example NPV was calculated to be $296,000. Generally, when the NPV of a prospective investment is positive, the project should be accepted because the cash flows will be positive.

Internal rate of return

Alternatively, some organizations use IRR as the gauge for evaluating projects. Such an organization might have a policy that new
investments must show compound average annual returns of 20 percent. To calculate a project's IRR, you discount future streams of annual returns \((CF_x)\) minus the initial outlay and annual expenses at some rate \(r\) until they equal zero:

\[
\sum_{x=1}^{n} \frac{CF_x}{(1+r)^x} = 0
\]

where \(CF_x\) is the cash flow in period \(x\), and \(n\) is the number of years the system will be in operation. Rate \(r\) is the IRR that results when the cash flows equal zero [14]. For example, a project with a $1 million \(NPV\) for a $100 million investment only yields an IRR of 1 percent. But a project with a $2,000 \(NPV\) for a $20,000 investment has a far more attractive return because the sum returned in current dollars is 10 percent. The organization risks less, but the return is far more favorable [14]. In the case study example the IRR was found to be 71.9%. An investment project is considered acceptable if the IRR exceeds the required return.

CFOs often view IRR as a better measure of an IT capital investment, because it does not give preference to the greater \(NPV\). Rather, IRR emphasizes the percentage annual return the profit represents over the project’s life. However, whichever technique an organization uses for measuring an IT investment’s financial value, measuring the payoffs while executing the project is still where the management of most IT projects falls short.

(Activity-based costing)

Activity-based costing (ABC) identifies the various activities performed in a firm and uses multiple cost drivers to assign overhead costs to products. In order to derive a savings estimate it is often viable to measure the current cost of activity, and demonstrate the reduction in number of tasks, average task time, or person required to perform the task, in order to demonstrate value [19].

At their basic level, ABC tools permit the systems analyst to capture hourly human resources, facility, and machine cost data on all process activities that the IT system will subsume or somehow change. ABC tools collect data on how often a particular activity takes place each day. The tools compute the total dollar cost of performing the activities. In ABC, an analyst identifies and measures the flow of inputs into activities and the outputs that flow from activities. This process captures information and metrics about the resources required to perform each activity [14].

In addition to the inputs, the analyst records machine, human resources, and other costs that go into creating the outputs, so that the analysis accounts for direct and indirect expenses. In ABC, analysts look for variances and trends to discover the activities or process redundancies.

Morgan identified that IT managers can use ABC to model an IT project’s scope. Requirements gathering can include the recording of ABC data. Most process analysts or users themselves can readily complete a data entry form describing activities and the time required to perform them [14]. Some organizations track hourly tasks on employee time cards, allocating costs to a job unit or specific project code. So cost data might already be available. Reviewing activities for possible automation is one way of forecasting tangible future return on investment (ROI) for an IT investment. Comparisons of before-and-after activity costs provide net savings data for activities the IT project will subsume or alter. Calculation requires (NA) Number of times task performed annually multiplied by (AT) Average time it takes to perform multiplied by (BR) Burden rate ($/hour) to equal ABC.

\[
ABC = NA \times AT \times BR
\]

(Economic Value Added (EVA))

Pisello described EVA as a standard indicator to measure the true value a company derives from its operations. EVA measures the difference between the return on a company’s capital and the cost of that capital [19]. A positive EVA indicates that the value has been created for shareholders; a negative EVA signifies value destruction. Basically, it measures the earnings of a company minus the rent it took to generate the earnings:

\[
EVA = Net Profit - Cost of Capital \times \frac{(total assets - total liabilities)}{(total assets - total liabilities)}
\]

Basically EVA is premised on fundamental economics that 20 years ago was called residual income. Today, EVA is being touted as an easy to use measurement of shareholder value. However, misinterpretations of free enterprise shareholder value have left EVA struggling to redeem its validity. Shareholder value advocates
believe that profits determine the firm’s stock price. In a study performed using 241 large US companies over 1987 & 1988; 1992 & 1993 taken from data collected by Stern Steward & Co., there is a positive correlation with stock returns [9]. While a separate study identifies that EVA explained no more than 6% of the securities price variations [6]. The appeal of EVA is that it is easy to use and it provides a clear picture of the businesses capital efficiency. Because of its ease of use it is portable through the ranks to ensure a common language [3].

Real Options Analysis (ROA)

Options Pricing Model (OPM)

Black-Scholes theory provides a method for pricing derivative securities, taking into account the volatility of price movements of the underlying security and the returns of alternative reckless investments. It was first published in 1973 by Fisher Black and Myron Scholes [13]. In their treaties, the five factors bearing on an option price were defined as: exercise price, underlying stock’s price, time to expiration, volatility, and risk free rate of interest [23]. PriceWaterhouseCooper’ Adam Broison, states, “Tech investments are like options. You look at what you’re doing, you’re not quite sure how it’s going to play out, but you manage it over time to create value” [16].

Financial literature offers several strong arguments in support of using the Black-Scholes model to price IT investments options. Benaroch & Kauffman cited Mason and Merton who suggested that, in capital budgeting, irrespective of whether a project is traded, we seek to determine what the project cash flows would be worth if they were traded as a contribution of the firm’s market value [2, 11]. The biggest problem with this approach is that it is very difficult to use.

IT Value Management (ITVM)

Although, 79% of respondents from an Ernst and Young 2002 study indicated that financial justification was important only 40% performed a financial business case analysis on a regular basis. In a 2002 study by ComputerWorld, 65% do not have the knowledge or tools needed to do ROI calculations; 75% have no formal process or budgets in place for measuring the ROI of IT projects; and 68% do not measure ROI on IT projects after the work is complete [19].

Lukac touts that it is not the IT department that needs to demonstrate IT investments to the business, but the business that needs to understand the value of the IT investments it is making in relation to other investment opportunities it may be considering [10]. Unfortunately, while this may be great idea, the practice is not necessarily followed by many companies. As such IT executives are the purveyor of value through investments utilizing technology. While it is true that IT executives have lacked the lexicon to explain what it does and how it works, they do need to define the framework as to what they do to create value for their firm. Without this framework, IT value is relegated to being perception which is often subjective and easily challenged.

Managing IT value is not a measurement technique; rather it is a process that utilizes metrics in order to ensure that tangible and intangible variables have been anticipated during the investment analysis. The broken ROI processes in place at many organizations need to be replaced by disciplined spending behaviors which are sensitized to the calendar, infrastructural, temporal, security, knowledge, accountability and connectivity issues [25].

It is believed that an ITVM methodology that addresses only individual project decisions will inevitably fall short because managing individual projects lacks the vision of collective value applied. In order to better understand this phenomenon, McShea developed the Multidimensional IT valuation approach by categorizing three approaches multicriteria, strategy frameworks, and portfolio management approaches [12].

Multicriteria approaches have their roots in multiattribute utility theory, with various approaches to mathematically combining each defined dimension’s scores. The end result usually takes a normalized score form (a 0 to 1 scale) or an adjusted ROI. The highest-ranking projects are selected within the available budget. A strategy framework approach explicitly defines strategic objectives and then derives the appropriate projects that enable those objectives to be met and establishes key parameters for measuring success. This method has been used in management practices aka “Managing by Objects” (MBO) a concept highly leveraged at GE. Portfolio management techniques take this a step even further and consider classes of projects to view with different objectives, both strategic
and tactical. In a portfolio-driven approach, the strategy is implicit in the framework definition (classes of projects) and is reflected by each project class’s funding allocation and the financial or other criteria applied to investments in each class. Table 1 shows a summary of popular and representative techniques that fit these three approaches [12].

Table 1. Multicriteria IT value management approaches

<table>
<thead>
<tr>
<th>Technique</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefit-cost analysis</td>
<td>Evaluates the benefits and costs of a project relative to its alternative uses.</td>
</tr>
<tr>
<td>Net present value (NPV)</td>
<td>Calculates the present value of future cash flows, discounted at a specified rate.</td>
</tr>
<tr>
<td>Internal rate of return (IRR)</td>
<td>Determines the rate at which the present value of cash inflows equals the present value of cash outflows.</td>
</tr>
<tr>
<td>Payback period</td>
<td>Measures the time it takes for the cash inflows to equal the initial investment.</td>
</tr>
<tr>
<td>Accounting rate of return (ARR)</td>
<td>Calculates the average accounting return on investment over the project's life.</td>
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</table>

Once an approach has been identified and implemented it is important to understand that the approach does not complete the IT Value Management Process. In fact, it should be extended to include a life cycle methodology. McShea identified the following ITVM life cycle. Each step of the lifecycle has unique interactions with the ITVM objectives. For example:

- **Project justification.** Identify costs and benefits and analyze value delivered.

- **Project planning.** Establish success criteria and metrics to be tracked through the project and after its completion to establish that the intended value was delivered.

- **Project execution.** Track actual costs versus expected costs, and adjust project benefits as you remove uncertainties along the way or encounter unanticipated issues.

- **Project completion.** Review benefits achieved versus those expected. Assign responsibility for any ongoing monitoring of metrics to track future planned benefits [12].

It is also highly recommended that a post-implementation review be administered in which you compare the original model to actual results and explain and account for any variances. To ensure that the approaches are consistently applied and enforced you should have a proper IT governance program in place.

**Conclusion**

A major challenge for IT research lies in making models and theories that were developed in other academic disciplines applicable in IT research and practice. In this paper, we explored a range of issues associated with the application of various IT investment projects. Though the models and their theory are well known to finance academicians, most people who do capital budgeting are ill equipped to understand all theories. This is especially true among IT professionals who have long relied on net present value, simple cost-benefit analysis, critical success factors and other less structured techniques to perform their assessments. The objective of this paper was to study value metrics and methodologies to understand why IT value is not being valued correctly.

It has been identified in this paper that traditionally most companies allocate IT funds based on NPV or ROI calculations. The problem with this approach was that it naturally favors projects that deliver productivity benefits, even when other projects with less tangible value may be more important to the overall business strategy. Also identified was the issue that projects with the highest NPV or ROI do not necessarily create the most value. What really matters is whether an investment supports critical business processes and affects key value drivers [18].

McShea was correct when he identified that the use of traditional return on investment (ROI) and purely financial metrics, no matter how sophisticated the methods, is not sufficient to completely characterize a given project’s value, let alone the overall IT program [12]. A framework needs to be selected using value
management methodologies so that the focus is on the performance parameters that matter to both business and technical people. The truth is IT does matter and it is up to IT executives to start running IT like a business by demonstrating the value that it delivers.

About the Author

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