Information Technology: Of Value or A Vulture?

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Abstract  

The value derivable from IT continues to be elusive, with most executives disappointed with the return achieved on their IT expenditure. Part of this stems from a lack of understanding of the nature of value creation through the use of IT. In this paper we present an approach that considers the journey from envisioning new uses for IT through to the actual realization of the potential value. This vision-to-value (V2V) vector captures both magnitude and direction, in a mathematical sense, of the journey towards value realization as both must be considered when addressing IT value. It proposes a definition of value, a financial formula, and identifies who should be responsible for securing value from IT investments. The analysis also considers the ongoing costs associated with IT service delivery and the issue of charge-back.

Keywords: IT Value, Value Creation, IT Investment, IT Evaluation, Charge-back
Is information technology (IT) the first industrial plague thriving inside organizations, gorging itself on their wealth? Has it, as Strassman has determined, contributed little or nothing to the bottom-line of many organizations? If more than 40% of IT projects fail, have all the profits generated by the IT industry come from destroying value in customer organizations?

The fact is, despite all the investments made in IT, there is still considerable disappointment among executives with the return that has been achieved. The hangover they have from the belief that the Year 2000 (Y2K) problem was oversold and that ‘e’ was over hyped has not helped this assessment. The so-called “productivity paradox”, highlighted well over a decade ago, unfortunately still governs the outcome of many IT projects. Equally worrying is that despite acquiring massive quantities of information technology, evidence suggests that most do not have a method for determining whether they have been benefiting from all this spend.

Perhaps inevitably, debate continues to rage as to whether IT is a cost or an investment. The recent controversy caused by Nicholas Carr’s proclamations in Harvard Business Review that now “IT doesn’t matter”, has again helped to propel this issue back onto the management agenda. His suggestion that IT has become commoditized has resulted in executive management teams, no doubt, re-evaluating how they approach IT investments. Forcefully, Carr argued that investments in IT, while profoundly important, are less and less likely to deliver a competitive edge to an individual company. “No one would dispute that information technology has become the backbone of commerce,” Carr says. “The point is, however, that the technology’s potential for differentiating one company from the pack – its strategic potential – inexorably diminishes as it becomes accessible and affordable to all.” IT becomes”, he argues, “a mere cost of doing business, and should be treated as such.” This position aligns with the view that many executives hold of IT that it is a utility and can be outsourced like electricity, water, car fleet, or even the canteen. Yet the research findings are unequivocal that IT is different from other corporate resources, and while outsourcing is a legitimate strategy, there are aspects of IT management that should never be left in the hands of external providers.

But what is value in the context of spending on IT? Value is much discussed but little attempt has been made to date to define what the word actually means in the context of information technology. This is redressed in this paper. However, disconcertingly, few business managers know what value to expect from IT, or how to calculate the value IT contributes or potentially could contribute, or indeed, how IT creates or destroys value in the first instance. The majority are under the illusion that once the technology has been implemented, everything necessary has been done for the benefits to begin to flow. This thinking is reflected in the practice of creating elaborate plans to implement the technology while the achievement of business benefits – the reason presumably why the investment is being made in the first place – receives little or no planning. The assumption behind this practice must be that benefits will automatically flow once the technology has been implemented. This logic is not only fundamentally flawed, but a key reason why so many IT projects end in failure. Indeed, one of the assumptions of Carr’s arguments is that it is the technology itself which is the
differentiator; whereas, the real benefits arise from how it is used. Consequently, value depends on how organizations handle innovation and change; and these are the only routes to value creation.

This paper describes a method for defining and determining ‘value’ in the context of IT by examining all of the activities which need to be performed along the entire journey from envisioning new uses for IT (the ‘Vision’) to ultimately creating Value for the business (see Box 1 for overview of this research). These activities are then set in a financial framework that clearly distinguishes investments from costs. This process also aids in identifying where responsibilities should lie for ensuring that any expected value is actually achieved. In addition, the paper considers the thorny issue of charge-back within a wider discussion of the economics of IT services. This is an essential part of the feedback loop for determining whether Value has really been created or in fact destroyed.

**Box 1 Overview of research.**

The findings presented in paper are from a study that has been exploring the concept of value from IT. This study was undertaken within a larger research program that is seeking to develop an approach to address IT governance issues in organizations. It also draws on the authors’ experiences with consulting assignments that have focused on realizing business benefits from IT investments.

The entire journey from vision to the ultimate manifestation of value for each use or application of IT is called a *Vision-to-Value (V2V) Vector*. This expression was coined reluctantly as it has not been possible to identify any term in the literature that encapsulates all of the activities that must be performed along this journey. The word ‘vector’ has been deliberately chosen as both magnitude and direction, in a mathematical sense, must be considered when addressing IT Value; value creation is a process not a point concept. Indeed, it is also used in the medical sense to denote a *means of passage*; appropriate given how value through the application of IT is created. Each of these Vectors – and an organization will have many of these at any one time – requires managing in order that Value can be realized from IT. Managing the interaction of Vectors across the entire IT investment portfolio of an enterprise further enhances the overall value created from the organization’s IT investments.

**The creation of value in the context of IT**

The first question to address is: what actually constitutes value in relation to spending on IT? That possession of the technology generates no value in itself has already been noted; in fact, to use the word value in the context of IT might be seen as somewhat inappropriate. Value from IT emerges only through how it is used by the organization, both operationally and
strategically, including in its interactions with customers, suppliers and perhaps even regulatory authorities.

Unlike many other investments that an organization makes, for example in industrial machinery, IT is purposeless in the sense that the organization has to determine the very specific purpose to which it will be put in the organization. Consider the analogy of pottery. The clay used by the potter, on its own, is worth but a few cents. Fashioning pottery depends on the skills, knowledge and experience of the craftsman. Essentially IT manipulates electronic digital signals just like the purpose of the potter’s wheel is to rotate clay. Which signals are to be manipulated and how must be determined.

What we have today is “electronic digital signal manipulation technology”. Information only arises in this context through the interaction of humans with this electronic digital signal manipulation technology; that is, it is up to the organization to decide how it is to be deployed and for what purpose. Contrast this with other capital equipment. A lathe, for example, can be used in cutting steel and that is all it can do. Its behavior is deterministic and calculations can easily be made as to what it can produce over its lifetime and constructing an investment proposal for such equipment is therefore relatively straightforward. IT is different, but unfortunately it is usually treated in a similar manner. It has also been shown that the high maintenance requirement for IT is atypical for most investment in plant and equipment. In general, the expectation is that new investments increase reliability of performance and reduce maintenance costs in comparison with the preceeding systems or equipment. So, what then is it that IT actually does? Although initially IT is purposeless, it is only when the desired information system is built that it can be considered as having a potential value. This potential value is based around the range of information handling services, through the manipulation of digital signals, which can now be provided for the business. It is the actual use of these services, often referred to as IT services (see Box 2), which is the mechanism by which value might be created; simply using these services does not guarantee that value will be created. It is what is achieved by that use which could ultimately lead to value creation, but even then this is not guaranteed.

Box 2 Information handling services.

Information technology (IT) facilitates the provisioning of information handling services. These services include those that enable communication and collaboration (i.e. email, desktop videoconferencing, instant messaging), data capture (i.e. point of sale [POS] systems, Internet-based data entry systems, business intelligence, customer portals), processing (i.e. order taking, invoicing, customer query management, account management), storage (i.e. data centers and databases with information about customers, inventories, assets, etc.), access (i.e. ad hoc queries, report writing), and analysis (i.e. analytics, modeling). One way of considering this service perspective is that, if the technology fails, it is not the loss of the technology per se that would result in problems for the organization, but the loss of the
organization’s ability to avail itself of these information handling services enabled by the technology.

Consequently, a second challenge to consider is how this value ultimately emerges. There are many possible ways that IT can be used on the journey to creating value. These include better decision making by improving organizational communication and coordination; enhancing organizational flexibility; coordinating supplier linkages; reducing search cost; improving quality (e.g. supporting Total Quality Management) and delivery techniques (such as Just In Time); redesigning business processes to improve efficiencies – cost, speed, and/or quality; facilitating the development of new products and services; enhancing existing products and services; delivering improved manufacturing techniques through Computer Aided Design (CAD) or Computer Aided Manufacturing (CAM); redesigning workflows; establishing and sustaining customer relationships; reconfiguring business networks; and extending the scope of the business.

What is important to recognize is that all these uses do not themselves create value. It is only if these uses increase the profit of the organization or, for not-for-profit organizations, improve what they exist to accomplish, that value can be created. But even then, insufficient benefits might be achieved to create value, thus destroy value through profligate spending on IT. Note, all these uses which potentially lead to ways of creating value demand business changes, and it is these changes that are enabled or shaped by the deployment of IT. Therefore, value only emerges through the successful achievement of the business objectives which implementation of these changes is envisioned to bring about.

This is why most IT projects fail, not for technical reasons, but for human and organizational reasons brought about by these changes. Yet, and this is where the irony lies, while most organizations develop elaborate plans to ‘get the technology in’ few have ever considered establishing plans to realize expected business benefits, let alone Value (see Box 3). It should be noted that benefits realization is not the same as value creation. Benefits realization is a necessary but not sufficient prerequisite. In order to create value the realized benefits must exceed the expenditure to secure them; thus benefits realization is only part of the journey towards value creation.

**Box 3 IT benefits management.**

Research conducted over the last decade at the Information Systems Research Centre at Cranfield School of Management on the thorny issue of IT benefits realization has developed a process to drive practice to increase the likelihood of potential benefits being actually realized. This process, illustrated below, is supported by a set of tools and techniques.
The IT benefits management process has five interdependent stages that can be described as follows:

**Identifying and structuring benefits:** The process begins by understanding the business drivers for the project; identifying all the possible benefits, and expressing these in business terms; quantifying and establishing those benefits (“scale and money”) and determining the distribution of the benefits (“where and who?”)

**Planning benefits realization:** Following on from this, decisions regarding “how” the benefits are going to be achieved, i.e. the business changes required, (including the identification of who will be assigned responsibility) and “when” the changes will be made are determined. Establishing metrics for performance measurement and ongoing monitoring of the project is also important.

**Executing the benefits realization plan:** This is the “making it happen” phase, in essence executing the change management programs. Monitoring progress against the activities of the benefits realization plan is just as important as for the IT development plan.

**Evaluating and reviewing results:** The philosophy of benefits management is that the benefits are tracked during the lifetime of the system. It entails formal reviews of what was and was not achieved in order to maximize the benefits of the project. The project is also evaluated not only to establish learning for future project but also to identify the potential for further benefits.


A key aspect of being able to create value through the use of IT is not just how it is deployed but the expertise of its users in working with information.\(^\text{17}\) For example, providing marketing professionals with analytical tools does not deliver value. Value only arises if they have the knowledge and skill to use these tools and the capability to use the information gleaned in order to achieve the envisaged business objectives. This is a much neglected aspect of IT management as it is often taken for granted that given the tools people will learn how to use them well. Experience with customer relationship management (CRM) indicates that it can take considerable time for marketeers to be able to manipulate and use the new information generated.\(^\text{18}\)
The Vision-to-Value (V2V) Vector

Consider the situation where a new use has been suggested for deploying IT within a business function, for example a data-warehouse with analytical tools in a Marketing Department. This vision or ‘new use’ might originate through a formal IS strategy process or informally, perhaps as a result of a senior marketing executive having attended a conference and watched a vendor demonstration. A business case and investment proposal are generally prepared identifying envisaged business benefits (‘BB’) which will accrue to the organization from this new use. Financial amounts are assigned to these potential benefits and they are evaluated in relation to the cost of hardware, software, and other resources, like people, that are needed in order for the new system to go live.

Once approved, a project – generally called an IT project – will be undertaken to create the new IT systems and facilities. Resources, both physical and human, are deployed in order to build the new system and possibly implement any necessary business changes. The resultant system then has the potential to deliver the aforementioned IT services into the business.¹⁹ When constructed (and implemented) this system now has potential value. The actual value is only realized as a consequence of the use of the technology – value does not arise in any other way. Figure 1 illustrates the relationships between business benefits, projects, services and resources. It is the inter-relationships between these that illustrate the Vision-to-Value Vector.

Standardizing Terminology

One of the major problems which besets clarification of the thinking around value is the lack of standardized terminology. Hence, in the remainder of this paper certain commonly used words and terms are defined to have specific meanings. These words and terms, when used with those specific meanings, begin with capital letters.

Projects are delimited sets of tasks undertaken to create and/or change something. Projects will typically contain interdependent sub-projects of two types: business change projects and IT projects. In the case of business change projects, they include designing and implementing new business processes, establishing new ways of working and creating new relationships, both intra-organizationally and inter-organizationally which utilize IT. As already noted, Business Benefits only emerge through business changes, and Projects provide the frameworks for making these changes, as well, of course of any implementation of technology (IT projects). Projects usually include analysis and design, requirements gathering and software development.

Services are regularly recurring activities undertaken, usually for an indefinite period, to assist someone or group of employees in the performance of their work. In the context of IT, these
activities are based around IT’s information handling capabilities, and are provided to assist users to utilize the new IT facilities. Application services provide the information handling abilities, while IT platform services result directly from the technical infrastructure, including scalability and connectivity.

*Resources* include people, hardware, software, telecommunications facilities, etc. These can be sourced in-house or from third-party providers. These Resources are deployed in Projects to build the IT platform, to make changes in the organization and, after the project has ended, to keep the IT Services up and running, IT operations and software maintenance.

Figure 1 illustrates the relationship between Projects, Resources and Services along the Vision-to-Value Vector (solid line). The dotted line illustrates the flow of resources to support the execution of projects as well as the ongoing provision of Services.

![Figure 1: A vision-to-value vector](image)

From this approach we can see that it is possible for some Projects to be assessed as successful but, overall, value is not created because the IT Services the Project delivers are a failure. It may be that either the wrong Services are being provided or that the Services are not being exploited.

Typically, Projects incorporating IT are seen as creating systems or sets of IT facilities and the parallel with construction projects is often used. However, IT related Projects should be concerned with bringing about changes in the way work is performed in the organization through more efficient or better information handling, otherwise there can be no Business Benefits and so no Value created from the new IT facilities. Projects in the context of IT should actually be thought of as creating IT Services and not just the systems and IT facilities.
Using the analogy with construction projects when describing IT Projects is to misunderstand the very essence of IT in organizations. Construction projects create tangible assets that generally have a market value. On the other hand, IT related Projects only bring about organizational change and very shortly after the physical assets comprising the software and IT facilities are acquired, they have little market worth since they will have been superseded by superior technology. No wonder Value in the context of IT is elusive!

The Financial Formulation of Value

How can the Vision-to-Value Vector be expressed in financial terms? Ideally this should be in some form which mirrors the usual definition of profit, i.e. income less expenditure. This would enable value to be considered in terms of its implications for profit. Our research and work with the Vision-to-Value Vector suggests the following equation:

\[
\text{Value} = (\text{BB} - \text{BCI} - \text{SCI} - \text{SRC}) \times RACM.
\]

The acronyms in brackets, defined below, represent four series of cash flows which are discounted at the Risk Adjusted Cost of Money (RACM) – RACM is explained later in the paper. Value is created (and profit increased) when the above expression becomes positive and, similarly, value is destroyed (and profit decreased) when it is negative. These acronyms are defined as follows:

BB, **Business Benefits**, is the increase in profitable income to the organization and/or cost savings contingent upon the use of the new, or changes to an existing IT Service. Business Benefits might or might not be quantifiable, especially when the business case is being prepared. For example, the implementation of an Internet site for taking customer orders is likely to increase sales, but it can be difficult to specify quantifiable profit increases. Similarly, a new logistics systems might result in fewer stock outages, which are likely to result in more sales, but again it can be difficult to specify the exact amount precisely. Dealing with unquantified business benefits in investment proposals is discussed later.

BCI, **Business Change Investment**, is the expenditure the business needs to incur to change itself in order to generate Business Benefits from its use of IT. Examples of BCI include designing new work procedures, implementing new business processes, retraining users, and labor severance costs.

SCI, **Service Creation/Change Investment**, is the expenditure on creating a new and/or changing an existing IT Service to be used by the business. This is essentially expenditure on labor. It should be noted that this labor can be provided by external vendors.
SRC, Service Running Cost, is the on-going expenditure needed to run the new IT Service and includes hardware, software packages and support staff. This cost can include maintaining data centers, networks, servers, backup and security, and activities associated with software upgrades.

The word *Investment* has been intentionally used here, as BCI and SCI are monies spent out in anticipation of securing greater sums at some later time. There is a gap in time between expenditure and securing the return for this spend. Investment also has the connotation that it (or some of it) could be discretionary and when times are hard it is this expenditure which could potentially be deferred.

The word *Cost* has been deliberately used in SRC as the components of SRC (e.g. depreciation, leasing and contract charges, and support staff salaries) are incurred contemporaneously with the provision of the IT Services and are necessary to keep the business running once the system is operational. This Cost is generally incurred even if the IT Service is not used or fully exploited.

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**FIGURE 2** Vision-to-Value vector: timing of cash flows.

As BCI and SCI are incurred at the Project stage, i.e. before the IT Service comes into existence and so before any Business Benefits arise from the use of the IT Service, Projects always destroy Value. Value only becomes positive, i.e. Value is created, when the Business Benefits exceed the sum of BCI, SCI and SRC, all discounted at the Risk Adjusted Cost of Money. Figure 2 illustrates the vision-to-value vector highlighting this fact. It also shows the timing of cash flows.
Acronyms beginning with the letter ‘B’ should be the responsibility of the business, i.e. the IT Service recipients. It is these individuals or groups who should be exploiting the new IT Service to improve the performance of their jobs. Those acronyms beginning with the letter ‘S’ should be the responsibility of the IT Service provider.

Thus, each Vision-to-Value Vector is a hybrid of investments and costs which goes some way to explaining why the debate over whether IT is a cost or an investment continues. Each Vector stretches out over time and whether it is predominantly a cost or an investment depends on the future and planned cash flows at the time it is being considered and the interests of the commentator. Hence, when examined at the Project stage it is likely to be viewed as an Investment but once the Service is in use it is a Cost.

**Rate of Return**

It is necessary to inject a word of caution at this point since an absolute Value figure does not actually assist in determining whether it is worth spending money on IT. As a single financial amount for each Vector it gives no indication of what amount needs to be spent in order to secure a particular amount in return. A value of $1M could be generated by one project where outgoings are $0.5M or another where outgoings are $10M. Clearly, the former is preferable to the latter. Hence, a rate-of-return also needs to be defined.

Rate-of-Return here is defined as the discount rate at which BB, BCI, SCI and SRC would give a result of zero for Value. A simple return on investment (ROI) approach such as that below has deliberately not been used:

\[
\text{ROI} = \frac{(\text{BB} – \text{SRC})}{(\text{BCI} + \text{SCI})} - 1
\]

as this raises issues over what is included in the calculation of each of SRC and SCI. This method gives different results depending on whether hardware and software packages are considered to be part of SRC or SCI. This on-going debate, unfortunately, is exactly what happens in many organizations. For Rate-of-Return, as defined above, this choice does not have to be made, so there is no ambiguity or confusion.

**Financial Objectives for IT Investments**

Having defined the Rate-of-Return it is now possible to set down a financial objective for IT. The following is suggested:

‘to maximize the Rate of Return from expenditure on IT within funding constraints’.

The reason for the proviso “within funding constraints” is that, if stated without it, then the Rate-of-Return could be maximized through greater expenditure, (e.g. by leasing hardware at
an interest rate below RACM), but that ignores the limitations on the funds available to organizations which any such objective needs to acknowledge. This objective remains valid throughout the life of each Vision-to-Value Vector.

During the Project phase, near the beginning of each Vision-to-Value Vector, the work on the design of the future IT Service should be seeking to find the combination of BB, BCI, SCI and SRC which maximizes the Rate-of-Return within funding constraints. That might occur at a level where BCI, SCI and SRC are all much higher than originally envisaged but BB has increased sufficiently to maximize the Rate-of-Return. Such a redesign might mean the Project is over the original budget or delivers different functionality or delivers benefits later than originally planned. These outcomes would usually be considered to be cardinal sins of IT Projects – but does that matter if by so doing Rate-of-Return is maximized?

Hence ‘on time, to specification and within budget’ are not appropriate organizational level measures for IT related Projects, despite customary wisdom. These criteria encourage a parochial view which is not consistent with the overall objective. It is maximizing Rate-of-Return within funding constraints which is paramount!

What happens further in time along each Vision-to-Value Vector? Consider the period beyond the completion of the Project which created the IT Service. The IT Service is now in use by the business. At that time BCI and SCI have been spent and so are constants in the calculation of Rate-of-Return. Only BB and SRC are still variable. How is the Rate-of-Return to be maximized now?

Now, maximizing the Rate-of-Return can only be achieved by increasing BB and/or decreasing SRC beyond what was previously envisaged. It might be extremely difficult to improve BB unless another Project is undertaken to improve the quality of the IT Service or its functionality. In the former case there is likely to be a point beyond which no extra benefits can be realized for the organization from improving quality, or decreasing returns set in, for example adding more seats to a help-desk or call center above a certain optimal number (that is why “all our agents are busy” is so often heard at peak times).

However, it should also be pointed out that any additional new Project would need to generate another new Vector of its own so it would not enhance the original Vector. Hence, the most likely way of improving Rate-of-Return for the original Vector is to decrease SRC. Fortunately, improvements in technology over time can do exactly this or efficiencies can be introduced or outsourcing might offer reduced SRC.

Thus, the financial objective set out above has a corollary for IT Services when they are operational. It is as follows:

‘Service Running Costs should be minimized so long as quality has been optimized’.
Quality has been optimized when any expenditure on improving it further would exceed any additional Business Benefits to be gained. Thus, while the financial objective remains the same throughout each Vector the actions which are needed to achieve it change and indeed the actions needed later along the Vector, might be exactly the opposite of what are needed at prior intervals of time.

As an example, early along the Vector, during the Project, the projected Rate-of-Return might be maximized by increasing SRC to increase envisaged BB, while later, when the IT Service is operational, the actual Rate-of-Return might be maximized by decreasing SRC! Thus the appropriateness of actions to maximize Rate-of-Return vary with each Vector, and vary over time along each Vector.

Business cases usually attempt to set up these Vectors, but once approved the Vectors almost invariably drop out of the organization’s consciousness. They are still there, however, and if uncontrolled they veer off in random directions with the most probable outcome being that Value is not created, but rather it is destroyed.

**Risk Adjusted Cost of Money (RACM)**

In the financial expression of Value the four cash flows were discounted at the Risk Adjusted Cost of Money. RACM is the hurdle rate which the Rate-of-Return must exceed for Value to be created. Clearly RACM needs to be above the cost of money otherwise the organization would be better off financially, paying it back to its funders rather than spending it on creating a new IT Service. Cost of money is the interest rate or equivalent (e.g. dividends) which an organization has to pay for the funds it uses. This rate is usually greater than the organization can secure on money it lends others unless it functions as a financial institution But how much more than the cost of money should RACM be? Many organizations add just a few percent to the cost of money for risk – but is this enough?

All investments involve risk as expenditure is incurred in the near term to secure a return in the longer term.\(^1\) Certain investments might meet expectations, others might exceed expectations, others might fall well short and, perhaps, all associated funds will be lost. For example, suppose money is lent by an organization to a group of people with the expectation that the lender will secure a 10% per annum real return net of bad debts. Suppose 40% of loans are likely turn out to be bad debts and none of these loans can be recovered and no interest payments are received from these bad debtors. What interest rate needs to be charged so that a 10% pa real return is still achieved despite these bad debts?

Well, the 60% who do repay their loans with interest will need to pay a staggering 83% pa, yes eighty three percent interest, for the 10% real return to be forthcoming to the lender! Thus the figure to be used for RACM should be determined from how successful the organization is in converting expenditure on IT related Projects and IT Services into Value. So if 40% of IT related Projects undertaken by an organization do fail to produce any Value then the Risk
Adjusted Cost of Money should be set at 83% pa if just a 10% real return is being sought. How many business cases would survive that test? The implication is that the vast majority of organizations set their equivalent of RACM at far too low a level. RACM should be determined by the organization’s ability to create value with IT.

Does this mean we should stop all further expenditure on new IT related Projects? Well, if Strassman is right in his analysis that overall IT has achieved a zero gain then, paradoxically, the answer is no! If 40% of IT related Projects fail then 60% are successful. If the gain across them all is net zero then, on average, organizations do get their original money back, i.e. overall, IT is not destroying Value. However, it has not been creating it either. This shows the successful 60% have an average Rate of Return of 66%, which is excellent news. Think of the difference if it was possible to kill off the failing 40% before anything was spent on them. Stopping such wasteful spend should therefore be a very high priority for management. Yet, many are reluctant to stop bad projects. Box 4 illustrates an example of the application of the Vision-to-Value Vector and the calculation of business value.

**Box 4** Example application of the Vision-to-Value Vector.

The spreadsheet below illustrates SCI, BCI, SRC and BB over 16 periods at the beginning from a project. The TOTAL row shows the net calculations for each period, with the DEBT row showing the net indebtedness over each of the periods. Assuming a RACM of 3% per period, it illustrates that it is only in period 12 that Value is being created. The rate of return from the project is 10.7%.

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| VALUE  | 1200|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| RACM   | 3%  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| R of R | 10.7%|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
The second spreadsheet illustrates the situation 3 periods later for the same project. The lightly shaded cells illustrate changes from the initial figures shown above in spreadsheet 1: some expenditures have increased but so too have expected benefits. Now, the project only begins to create value in period 13. The rate of return for the whole case has now reduced to 8.8%. This situation looks as if the project is looking less attractive. However, if we treat the first three periods as money already spent, and look forward, the ROR is now 23% and the case is even more attractive than it was originally.

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Responsibility for IT expenditure

Although not explicitly stated earlier, all of the above discussion is predicated on the principle that all expenditure on IT is on behalf of one or more business functions, processes or areas of the business. After all it is only they – business management and users – who can secure Business Benefits so that Value is ultimately created. It follows therefore that every cent of IT expenditure should be attributed to one or more business functions, processes or areas as it is part of the expenditure of these business functions just as are their staff costs. Regardless of whoever actually commits to spend money on BCI, SCI and SRC, as detailed in the business case, the approver should ensure these sums are reflected in the budgets and forecasts of the benefiting business functions or processes just as their staff costs are.

There is a school of thought which considers the total cost of ownership from the perspective of aggregating certain costs in business functions with IT organization expenditures to determine the wider cost of the helpdesk, desktops and other facilities as if these costs are
really IT organization costs. This runs completely contrary to the principle that all expenditure made by the IT organization is on behalf of the business as it implies business functions are incurring costs which should be attributed to the IT organization. It is useful only at a micro-level when assessing different approaches to undertaking these activities; otherwise it distorts the business perspective of IT expenditures.

The business functions might well argue that they cannot be held responsible for what the IT organization spends. But this is to forget where the source of funding for IT comes from, and that as it is ultimately the business functions’ money they should still be approving what the CIO spends. The CIO should not be spending money other than on behalf of those business functions which provide it. In theory, the IT organization’s budget should be net zero with all of its expenditure charged to business functions.

Most organizations traditionally assign a separate annual IT budget to the IS organization. This practice stems from the fact that IT is seen as the responsibility of the CIO and that IT can be managed from within a box on the organization chart. It is typically found where IT investment is driven by the IT organization. This practice is dangerous for a number of reasons:

- It is information which should be the prime focus of management, technology is a secondary consideration.
- Information permeates all activities of the business. No employee in the organization is immune from the need to handle information, and individuals in the organization must exhibit an ability to work with information if Value is ever to be created from using it.
- In many instances, IT is deployed across the organization to coordinate business activities.
- Success with information systems demands the involvement and engagement of non-IT specialists.
- Technology itself has no inherent value. Business Benefits only emerge through change and innovation and only non-IT specialists can make these business changes.
- The IT organization, CIO and technologists can only ever deliver technology and IT services.

The IT organization can therefore not be considered as a distinct function like marketing or manufacturing or logistics, but one that transcends all others. The perspective of the IT organization as a separate unit in the organization and one that can be managed as such, is unfortunately the dominant one found in the literature and a perspective that drives practice. While outside the scope of this paper to engage in a discourse around the conceptualization of the IS organization, it is collectively the teams of people throughout an organization wherever they are located and regardless of to whom they report who are held responsible for the creation of new IT Services and running IT Services and includes those outside the organization employed by, say, an outsourcer.
Figure 3: The remit of the IT organization: IT held accountable for what it has no control over.

Problems typically emerge when the Vision-to-Value Vector drops out of the organization’s consciousness, which is usually just after the business case is approved. Immediate action should be taken to adjust the associated business functions’ budgets and forecasts at the approved BCI, SCI and SRC levels. Likewise, anticipated Business Benefits should be built into the applicable business functions’ budgets and forecasts. Then, if the CIO overspends, for example, because of inaccurate technical estimates, then the CIO can be held accountable for the difference; except of course when the business functions themselves give rise to the overspend.

The Charging-out of Service Running Costs

Typically, SCI has been found to be relatively easy to cross-charge as it is usually mostly people’s time – and each Project has a finite duration. The difficulty comes later with the SRC, when the IT Service is up and running. When SRCs are included in business cases they are generally estimated on the basis of increases in overall IT running costs arising from the new IT Service. They frequently, however, do not make adequate provision for future technology changes, software refreshes, fixing quality problems in new systems and IT facilities, and increases in the workload of support staff. It is therefore no wonder so many CIOs have problems later when trying to secure extra funds for infrastructure changes. It is most likely that inadequate provision was made for such future changes when they should have been part of the SRC cash flows in the original business cases for proposed IT Services.

If proper provision is to be made it should be done on an incremental basis, over the full life of the IT Service and against certain constraints like volumes of transactions and quality criteria. Some form of incremental costing is appropriate since if the case is not approved no one else and nothing else is affected. Each business case needs to reflect the effect of it being approved.

By adopting the approach of adjusting budgets and forecasts when business cases are approved the business functions will know what they have committed to spend over the coming years on the new IT Service and the IT organization will know how much funding to expect and from which business functions. Since the IT organization would not have its own budget but draw from those of business functions it serves, any targets to reduce IT
expenditure would be applied through business functions considering what they can do without; but even then reductions might take some time to work through, as discussed later.

Once the IT Service is operational, for some mysterious reason most IT organizations start tackling IT Service Running Cost recovery on the basis of usage. This calculation tends to be either a fixed amount based on past usage or direct charging based on ongoing usage. While these practices, particularly charge-back based on usage, might have intuitive appeal, why foist this change in accounting on the business functions? The business functions must be committed to the original SRC figures, not whatever is concocted later. If the basis of charging for SRCs changes from incremental to usage costing then this makes nonsense of the original business case. By changing the basis of calculating the SRC figure some applications could very well now be unjustifiable and others which failed to get approval could have been justifiable. How are business functions to be held accountable if the rules are changed between business case approval and Value creation?

Furthermore, the original business case should have committed business functions to certain levels of ‘repayment’ of spend. If the organization does spend that money then those business functions must be held to their repayment commitments regardless of whether or not the Project completes, whether they ever use those IT Services and if they do, regardless of the extent to which they use them and the extent of the benefits (if any) they gain. This again means recovery on the basis of usage makes no sense as, by this method, if a business function stops using a service it would no longer be charged for it, yet any remaining SRC still has to be funded from somewhere, why should others have to pay more?

There are very few cases where the IT organization can genuinely reduce its outgoings in proportion to usage decreases and this applies whether the IT Services are provided in-house or by outsourcers. Typically, usage reductions result in no savings to the organization and if they do they are very small or some time, perhaps years, has to elapse before they take effect. In fact, small increases in usage might give rise to substantial increases in running costs.

**Origins of Service Running Costs**

In considering SRCs, it is vital to understand what determines them. The major determinant is the work done in the Project stage which creates the IT Service. This work establishes the design of the systems and IT facilities as well as the technology and vendors selection for the implementation of the resulting IT Service. When looking at today’s IT Services Running Costs it is important to realize these factors were effectively fixed sometime, possibly a long time, in the past.

Back then, commitments were made to acquire certain equipment and by default, later generations of it. Commitments were made to software products and again, by default, future versions of them. Indeed, many software vendors charge an annual license fee for their software, with the organization usually committing contractually for a number of years, even
if the software is never used or falls out of use. The system’s design set limitations on what each IT system can be used for. The quality of the work determined how expensive it will be to maintain and to enhance the IT Service. Contractual commitments are made to suppliers for various services, like telecoms, perhaps for years to come.

Thus, today’s SRCs carry lots of historical baggage, much of which cannot be discarded easily. Consequently, it might be necessary to wait until the end of depreciation periods and the end of contracts with suppliers before any changes can be made to the underlying cost base. It may also be necessary to spend a great deal of money to improve the efficiency and quality of existing IT Services to make them cheaper to run and support.

Typically, such actions do not immediately affect the underlying cost base if the IT Services cease to be used by business functions, as the organization still has to keep paying until some sort of break arises, like the end of a contract with a supplier or the opportunity to renegotiate a contract. If the organization still has to keep funding this cost so should the relevant business functions that were expected to use the Service. The business functions were, after all, the cause of commitments being made in the first place. Hence the SRC which should be charged back to the business functions is unlikely to bear much relationship to their usage of IT Services. Whereas, it must be related to what the business functions agreed to ‘repay’ the organization, either at the time the business case was approved or when subsequent changes were agreed.

Non-quantified Business Benefits

In the previous sections it was argued that accountability should be assigned to appropriate business functions for repaying the organization for expenditure incurred on creating IT Services and for the provisioning of them. Remember that it is only these business functions that can secure Business Benefits. This position helps to address the issue of unquantifiable Business Benefits at the times initial business cases are considered and when they are re-examined along each Vision-to-Value Vector.

Non-quantifiable benefits have always been a thorny issue in constructing investment proposals. Inevitably, non-quantifiable benefits have to be translated into something that eventually has a real monetary value. For example, the objective of increasing customer satisfaction should be translatable through increased retention rates and reduced defections into more profitable sales per customer. When Business Benefits are expressed as being unquantifiable the elements in the formula used to define Value can be rearranged. If BCI, SCI, SRC and RACM are known then a figure can be derived for BB. This is the minimum Business Benefits that need to accrue to create Value. That figure for BB is the net present value, at the Risk Adjusted Cost of Money, of the required Business Benefits’ cash flow.

Once derived in this way, the relevant business functions can now consider whether or not they are likely to be able to secure this present value from how they are planning to use the
new IT Service. They will ultimately have to fund this amount, or whatever is actually spent on their behalf, to provide the IT Services. The question that needs to be addressed is whether the relevant business functions will be able to afford to do so. It is up to those business functions and whoever they need to convince to ‘lend’ them the money. This is not an issue for the CIO or IT organization, although IT staff can help in making the relevant calculations.

Ring Fencing Business Benefits

Few organizations ring fence the sources of the Business Benefits they are seeking at the time each business case is approved, let alone keep them in line with changes, over time, along each Vector. It is not enough to indicate areas of benefit e.g. sales will increase by $X and/or costs will reduce by $Y. There should also be explicit identification of how benefits will be made to arise (i.e. changes to be made), how sales will be driven up, how costs will be reduced, who in the business functions will do what and by when to secure the Business Benefits. This is where establishing a benefits realization plan comes in; it is an explicit cause-effect linkages of changes required to deliver expected benefits.

One of the reasons this ring fencing is so important is that the organization will only be conscious of the business benefits at the time the actual changes in the business functions take place, e.g. when new sales levels are reached or employees are re-deployed. Once the new levels of sales and costs become business as usual they will no longer register in the organization’s consciousness as attributable to the new IT Service. The expenditure on the IT Service will just become another business cost to be attacked.

It is only by positively acknowledging the realization of each of the planned Business Benefits immediately each of them is realized that there can be awareness that Value has been created, or if the Business Benefits fall short, that Value has been destroyed. Regardless of whether Value has been created or destroyed, the principle that all IT expenditure is on behalf of one or more areas of the business and this expenditure is included in their budgets and forecasts, means the business functions still have to fund it. If they have destroyed Value then it is they who have to address the situation. Another key reason for ring fencing benefits is to ensure that business benefits are not being attributed to more than one Vector.

This approach is no different from what currently happens from a corporate point of view as the organization benefits or suffers anyway. The difference is the accountability of the business functions for the IT expenditure incurred on their behalf and their responsibility for creating Value as a consequence; or if necessary, to compensate the organization in some other way like taking budget cuts or increasing attainment against their targets to fund their IT expenditure commitments.
Interaction of Vectors

So far this paper has concentrated on maximizing the Rate-of-Return for each Vector independently from all other Vectors, i.e. each Project has its own Vector. However, overall Value creation for the organization can be further enhanced by considering the interaction of multiple Vectors. To do this, the portfolio of investments must be examined.

Typically, IT organizations have a development budget and an operations/infrastructure budget. On a first pass the development budget ought to align approximately with the sum of all SCIs across all Vectors and the infrastructure/operational budget should align approximately with the sum of all SRCs across all Vectors. However, Investments and Costs (as defined earlier) are usually so intricately intertwined that a special exercise needs to be undertaken to secure clarity about which expenditures are in which category.

There are certain activities associated with SCI and SRC for which unit costs reduce by aggregating them. Examples with respect to SCI include the reuse of pre-existing standard software modules and common software for organization wide applications. Examples for SRC include data centers, network monitoring and 24x7-helpdesk support. The extent to which such economies of aggregation apply depends on the particular activities, their underlying cost structures and the volumes involved. It is important to note that volume alone does not deliver further Value and above certain volumes the expenditure to achieve further aggregation might result in diseconomies of aggregation. There are no economies of scale associated with many IT activities, for example, desk side support, project management, and software development.

Achieving optimal economies of aggregation is a key role for the IT organization and indeed the justification for the IT organization’s existence should depend on it doing so. If aggregation of Vectors does not produce further Value then why not let each business function set up and run its own IT? There is an overhead to aggregating activities.

Management of Vectors

Since Vectors are the prime source of Value creation they must become the prime focus of management attention. In the past management has tended to focus its efforts on individual elements like SCI through project management and SRC through service delivery management. However, these have tended to be managed in their silos with inadequate cross communication between those working on Projects and those on IT Services, let alone communication with the rest of the business. The consolidation of IT functions within organizations and outsourcing (which is a form of consolidation with other organizations) have also given some impetus to securing benefits of aggregation, although this is generally a poorly understood subject.
Vectors move around in time and place. They certainly cannot be caged up in the IT Function. What is more, they need constant attention from all those associated with them and if it looks as if any are going to destroy Value (the business justification for continuing expenditure on creating the new IT Service might diminish or disappear along the way) they must be redirected or killed off before they cause more Value destruction.

It is no coincidence that Figure 2 portrays the Vector in the form of a rocket fuelled by the business case. Vectors can be just as destructive as unguided missiles. A guidance system is needed for each Vector. Controlling Vectors is a full time job for a number of people, not a steering committee which meets for a few hours infrequently. At any point in time there will be scores, hundreds or even thousands of these Vectors passing through an organization and they will each be at various stages along their paths, requiring different types of management actions at different times.

**Conclusion**

Value creation from IT in an organization depends critically on managing a chained sequence of activities, here called the Vision-to-Value (V2V) Vector, which travels from envisioning new uses for IT, through the constitution of projects which create IT Services to be used by business functions and processes to generate benefits. It is only when business users have actually generated Business Benefits in excess of the expenditure on IT and associated activities is Value ultimately created. Until then all that has happened is that Value has been destroyed.

Attention to date has been focused on managing collections of the elements of Vectors, like Projects, transversely across Vectors, rather than focusing on how Vectors lead to Value. It is now time management paid much greater attention to managing Vectors along their length so that the target is Value creation with the maximization of Rate of Return. If each Vector is not managed to create Value it will absolutely certainly destroy Value. Will IT be something of value in your organization or a vulture gorging itself on its wealth? The answer is in the hands of management and the approach adopted from envisioning new uses for IT to ultimately creating value for the business.

**Notes**


It is worth pointing out that Swanson and Ramiller have addressed the issue of social cognition that drives innovations in new information systems. They introduced the concept of an organizing vision and explain how a collective, cognitive view of new technologies enables success in IS innovation. Martins and Kambil have examined how managers’ experiences with a specific strategic information technology in their industry influences cognitive managerial tasks associated with new information technologies. See E.B. Swanson and N.C. Ramiller, ‘The organizing vision in information systems innovation’, Organization Science, Vol. 8, No. 5, 1887, pp. 458-474; and LL. Martins and A. Kambil, ‘Learning from experience: managerial interpretations of past and future information technologies’, in Proceedings of the 16th Annual International Conference on Information Systems, Amsterdam, The Netherlands, December, 1995, pp. 43-54.

David Feeny of Templeton College Oxford University made this observation to us.

Published in European Management Journal

Organizations don’t buy an information system (IS) but information technology (IT).


For more on IS services, see J. Peppard ‘Managing IT as a portfolio of services’, European Management Journal, Vol. 21, No. 4, 2003, pp. 467-483.

There is lots of evidence to support this position. See J. McDonagh, ‘Not for the faint-hearted: social and organizational challenges in IT enabled change’, Organization Development Journal, Vol. 19, Spring, 2001, pp. 11-20.


For more on IS services, see J. Peppard ‘Managing IT as a portfolio of services’, European Management Journal, Vol. 21, No. 4, 2003, pp. 467-483.


This is not strictly true as if SRC is reduced by the IT Function, Value will increase so long as BB is not reduced by so doing. Reducing SRC might not need involvement of any business function where for example the IT Function replaces an IT supplier with a cheaper supplier.

Further discussion on this point can be found in J. Peppard, Rethinking the Concept of the IS Organization: An Analysis of the Dependent Variable. Paper presented at 20th European Group for Organizational Studies (EGOS) Colloquium, Ljubljana, Slovenia, July, 2004.