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Making information systems work

# VALUE MEASURING IT RETURNS

Abstract



# Making information systems work

An initiative from the ICAEW IT Faculty

*Measuring IT returns* addresses the theme of value and is the first report to be published in *Making Information Systems Work*, the thought leadership programme of the IT Faculty of the Institute of Chartered Accountants in England and Wales (ICAEW).

New technology has transformed the way we interact with one another and do business. However, as the number of technology opportunities grows, so too do the challenges of successful implementation. The *Making Information Systems Work* programme considers these opportunities and challenges, engaging all sectors of the economy in the debate.

This initiative is not just about making technology work. It is about making technology work with the wider systems around us. In order to do this, information systems need to be based on:

- value: the economic case for IT investment;
- trust: a secure environment to transfer information; and
- standards: a sound technical basis for the exchange of information between parties.

*Measuring IT returns* considers the challenges faced by many businesses in applying financial analysis to IT investment opportunities. In doing so, it aims to help businesses apply such techniques more meaningfully, thereby improving decision making and implementation in practice.

The ICAEW operates under a Royal Charter, working in the public interest. As a world leading professional accountancy body, the ICAEW provides leadership and practical support to over 132,000 members in more than 160 countries, working with governments, regulators and industry to ensure the highest standards are maintained.

The ICAEW's IT Faculty provides products and services to help its members make the best possible use of IT. It also represents chartered accountants' IT-related interests and expertise, contributes to IT-related public affairs and helps those in business to keep up to date with IT issues and developments. As an independent body, the IT Faculty is able to take a truly objective view and get past the hype surrounding IT, leading and shaping debate, challenging common assumptions and clarifying arguments.

We welcome views and other comments on this work and the other themes in this programme. For a copy of the full report or for further information, please email [informationssystem@icaew.com](mailto:informationssystem@icaew.com) or telephone +44 (0)20 7920 8538.

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# MEASURING IT RETURNS

## Abstract



## Rising to the challenge of IT value

This report addresses the challenge of measuring returns from IT projects. It aims to help senior management better understand the business opportunities that IT presents and how to realise value from them.

IT is a major area of expenditure for businesses of all sizes and in all sectors across the world. Claims are made that it has brought new ways to deliver value, new ways to create value and even new types of value. Yet it is often unclear whether returns from IT justify the money spent. All too often, IT expenditure seems to be based on little more than a leap of faith or a fear of being left behind or a resigned acceptance that there is no alternative.

The need to understand the potential of IT to create value is particularly important during an economic downturn. Businesses which are confident enough to buck the trend and invest selectively in IT may be able to gain significant competitive advantage.

Continuing difficulties in measuring the value of IT have been evidenced down the years by:

- Robert Solow's so-called productivity paradox;
- firm level measures of IT spending which are of little use;
- limited internal reporting of IT investment returns;
- high profile IT project failures and overruns;
- cycles of hype and perceived underachievement; and
- Nicholas Carr's claim that IT doesn't matter.

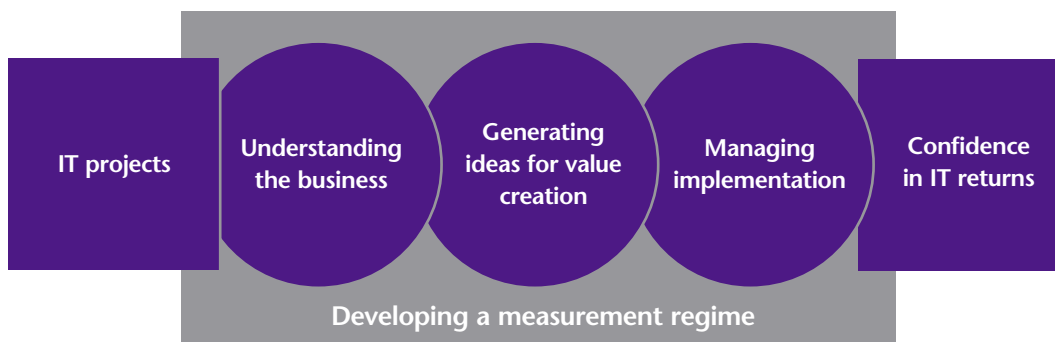
This report focuses on the challenge of achieving financial returns from IT expenditure at the level of the individual business. Businesses prioritise potential investment projects using appraisal techniques based on cash projections. But there is a problem in applying these techniques to IT projects. It is difficult to isolate and predict IT project-related cash flows, particularly for financial benefits.

However, there are no radically different techniques which will overcome the problems typically experienced in the context of IT investments. Searching for new techniques ultimately risks missing the point of investment activity which is to generate positive net cash flow. Consequently, rather than looking for new investment appraisal techniques, the report looks at how businesses can apply existing techniques to better effect. This involves developing a measurement regime to anticipate and monitor the cash flow costs and benefits of IT projects. It does this by supporting three essential activities:

- understanding the business;
- generating ideas for value creation; and
- managing implementation.

The resulting framework is shown in Figure 1 below.

**Figure 1: Earning returns from IT**



We ground our ideas of IT value in mainstream thinking about how businesses generate positive cash flows and the role that information plays in this process. We put little focus on the technology itself. Rather, we aim to provide a common language in which IT specialists and the wider business community can discuss how IT can enhance the value a business offers to a range of parties. By linking measurement with three essential activities frequently undertaken in isolation, we can also develop a rich picture of the opportunities and challenges presented by IT.

While the report refers primarily to businesses, much of the analysis is applicable to organisations in the public and not-for-profit sectors. In addition, the focus on costs and benefits is consistent with a view that public policy and regulatory interventions to promote expenditure on IT need to be justified on the basis of the net benefits that they will deliver.

## Developing a measurement regime

An investment represents the transformation of costs into financial benefits through the activities of the business. Investment appraisal techniques are designed to compare two sets of numbers for costs and financial benefits.

Investment appraisal techniques determine a return on investment (ROI) which summarises a project's net financial impact, indicates whether a project is worthwhile and allows it to be compared to other projects and ranked. The four principal techniques used in practice are: payback period; internal rate of return; net present value; and residual income.

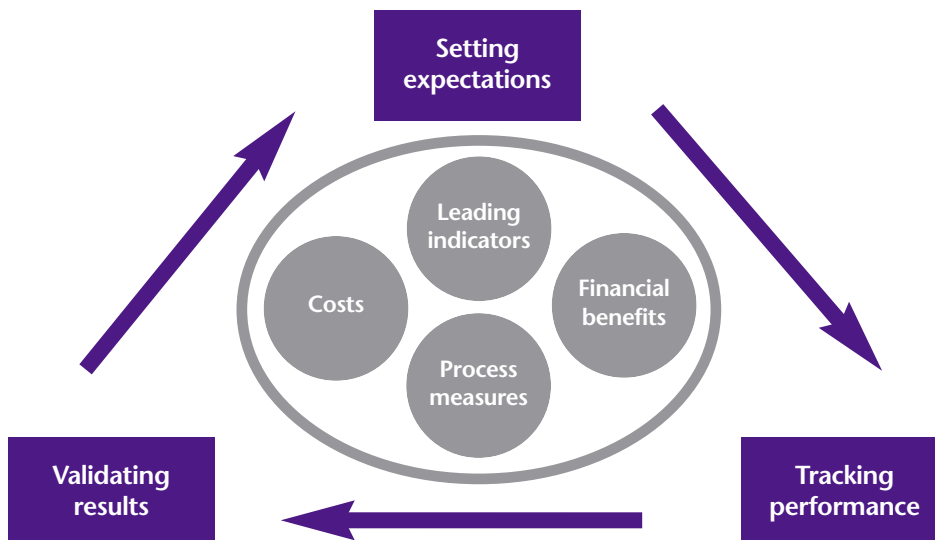
Businesses applying any recognised technique need to develop a measurement regime to calculate the ROI earned from IT projects. A measurement regime helps to build a common understanding of investment opportunities and builds confidence across a business that it is spending resources wisely. It also provides a focus and discipline for management and, by building organisational commitment, it increases the likelihood of earning good returns.

However, while measurement is important, it is not an end in itself. What ultimately matters is the return a project achieves. The regime for predicting, tracking and validating such returns needs to be proportionate to the business and the IT projects involved. A measurement regime is also part of a wider accounting system and needs to fit with an organisation's systems for:

- setting targets and budgets;
- establishing individual performance accountability and incentives;
- determining hurdle rates of return and payback periods;
- allocating capital and sharing resources;
- centralising and delegating authority; and
- defining the relationship between the IT function and the rest of the business.

Against this background, an effective measurement regime will have certain common features related to the types of measures used and the measurement cycle of a project. These are summarised in Figure 2 below. A business can consider four types of measure when assessing returns from IT projects, namely costs, financial benefits, leading indicators, and process measures. Three phases of a project measurement cycle are setting expectations, tracking performance and validating results. Over these three phases, management will use measures of costs, financial benefits, leading indicators and processes in different ways.

Figure 2: A measurement regime



The measurement of IT project costs is complicated by the need to pick up the full range of indirect and hidden non-IT costs that might arise. Financial benefits of IT projects are generally even harder to isolate and quantify because the process of transforming costs into financial benefits can be complex. In recognition of this, leading indicators are intended to be non-financial measures of improvements in the operations of a business or perceptions of its value which will ultimately lead to improved financial performance. The complex linkages between costs and financial benefits also call for strong management supported by appropriate process measures.

## Understanding the business

Creating value through the use of IT depends on understanding the business which is undertaking the IT project. Analysis of this essential activity is underpinned by:

- a representation of business models in terms of value exchanges;
- the central role that information plays in explaining why any business exists;
- the impact of IT on information supply and demand within a business; and
- the potential of any technology for creative destruction.

Just as economic models are useful in explaining how economies work, so a business model represents an understanding of a business which is intended to show how it works. It simplifies complex relationships and dependencies to enable analysis and comparison. Because this report is concerned with how IT projects create value for a business, its presentation of business models focuses on how a business engages in exchanges to create value for different parties.

A business can be seen as existing in order to serve counterparties, including shareholders, lenders, customers, employees and suppliers. A business undertakes exchanges of value, providing each of its counterparties with something of value to them, and getting something of value to the business in return. Value can be exchanged in the form of cash or labour, products, services and other resources including information.

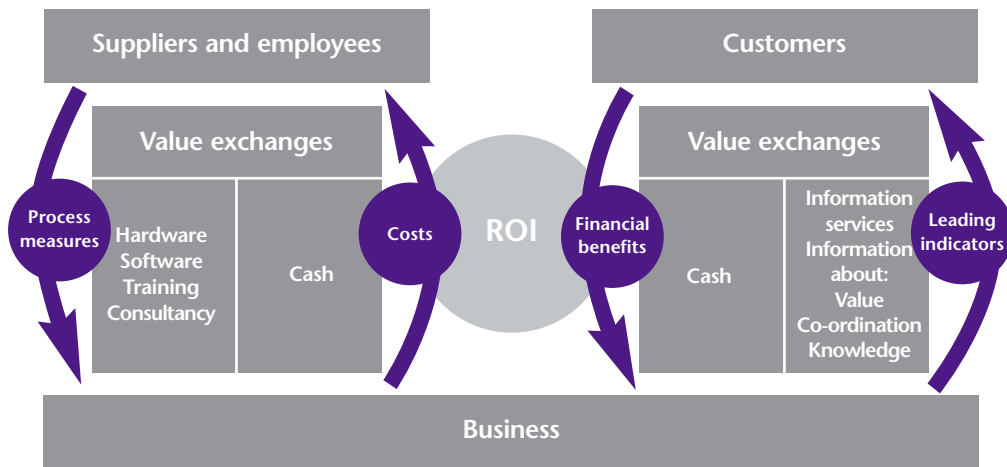
To survive with a sustainable business model, a business needs to maintain a set of relationships with counterparties which balances their interests and delivers value to all of them. A business also needs to monetise the value delivered to counterparties so that it does not run out of cash. Furthermore, the survival and success of a business are fundamentally affected by competition.

With regard to investment projects, a business needs to earn returns on the cash invested through suppliers and employees by generating cash from additional sales to customers and reduced payments to suppliers and employees. However, before this analysis is applied to IT projects, attention is drawn to three features of IT projects that make them special.

- Information is central to all businesses. It underpins why a business exists, what it does and how it provides value to counterparties. Information enables a business to communicate value propositions to potential counterparties and understand their needs. It enables a business to co-ordinate activities across different counterparties and thereby deliver value to all of them. Information also supports organisational knowledge and the ability to codify and share learning across a business or with counterparties.
- IT has a dramatic effect on the economics of information. Although information is pervasive within any business, its availability is limited because it is subject to the laws of supply and demand. There is a benefit to having information. But there is also a cost attached to the activities of collecting, storing, securing and communicating it. Therefore a business and its counterparties only have access to some of the information that could be available. However, IT has very significant effects on information supply and demand curves and the result is an information explosion.
- IT embodies technological change that has the power to unleash the 'creative destruction' written about by Joseph Schumpeter. Therefore any business should be aware that it could pay a heavy price if it does not exploit the value creating possibilities of IT to the full but its competitors do.

The overall effect is that all businesses need to bear in mind that they can earn returns on their investment in IT not only through revenues from information services and cost savings but also from information about value, information for co-ordination and information that codifies knowledge. The challenge is summarised in Figure 3 below which shows what is involved in securing positive returns from IT projects.

**Figure 3: Creating value from IT projects**



## Generating ideas for value creation

Creating value through the use of IT depends on generating ideas for value-creating projects. Analysis of this essential activity is underpinned by:

- a proposal that businesses actively seek to maximise value even from projects that they apparently have to do;
- a clear understanding of the central role that information plays in all businesses; and
- a framework for thinking about the benefits of applying IT to information that represents a new service, communicates value, supports co-ordination or codifies knowledge.

The aim is to promote confidence in the value of IT projects by basing IT expenditure on more than a leap of faith, a fear of being left behind or a resigned acceptance that there is no alternative. It is also important to provide substance to back up claims that IT brings new ways to deliver value, new ways to create value and even new types of value. Whether a business is in a period of growth, stability or retrenchment, it will benefit from clear thinking about how IT projects can deliver value.

Some IT projects appear to involve little choice. There can be compliance or regulatory reasons for making IT investments. Hardware or software may no longer work and so need to be replaced. There could be compelling non-technical reasons for making an investment such as uneconomic manual workarounds or the control problems associated with old systems. Other projects are seen as reactions to outside events aimed at tactical rather than long-term strategic advantage.

While many IT projects will appear to suggest themselves, it is proposed that businesses develop a more active and benefits-led approach to IT investments. This means looking for value opportunities in all projects and also generating ideas for projects by starting with benefits the business would like to achieve and assessing how to achieve them at minimum cost through IT. A business is likely to increase its chances of success by developing a clear structure to identify benefits. Six main types of benefits which may be achieved through the effective implementation of IT systems are presented with supporting examples.

Investment in IT can create value by:

- creating new types of value because IT is applied to information that will support new information services, encourage new information intermediaries and enable users to create their own value;

- improving the search process because IT provides information on value that will reduce search costs, provide access to new markets and improve supplementary information that is available from new sources in the marketplace;
- increasing efficiency because IT is applied to information for co-ordination that will reduce the cost of information-related activities, improve co-ordination through more accurate information, automate and improve decisions, reduce the need for physical assets and improve processes through knowledge sharing;
- improving control and governance because IT provides information for co-ordination that will reduce the risk of error and improve visibility of operations;
- removing operational constraints because IT provides information for co-ordination that will handle an increased volume of counterparties, enable outsourcing to suppliers, support global operations, encourage collaboration and create organisational flexibility; and
- improving value propositions because IT provides knowledge that will give better understanding of counterparty demands, enhance counterparty experiences and strengthen innovation through knowledge sharing.

The power of these benefits is also demonstrated by their ability to damage competitors through new competition, network effects and destruction of value propositions.

## Managing implementation

Creating value through the use of IT depends on managing the implementation of IT projects. Analysis of this essential activity is underpinned by a recognition that the association of specific management practices with successful outcomes is helpful but does not establish cause and effect.

Despite all the opportunities there are for businesses to create value through IT and a wealth of documented project management practices, achieving demonstrable benefits remains stubbornly difficult for many businesses. Four major implementation challenges are discussed. For each of the challenges, management techniques drawn from a wide range of literature are outlined and illustrated.

First, managing risk and uncertainty is complicated by the difficulty of predicting how counterparties and competitors will react to changes in information flows. Here it may help to:

- apply options thinking to recognise the value of waiting and delaying irreversible commitments;
- recognise path dependency to focus on simplicity, openness and flexibility and maximise future choice;
- adopt a portfolio approach to balance the risk and reward profile of IT projects; and
- maintain strategic focus in the risk management activities associated with specific projects.

Second, transforming information systems is complicated by the fact that businesses already have their information systems configured to their current ways of operating and changing them can require significant effort. Here it may help to:

- encourage radical thinking by allocating time to trying out new ideas;
- map information flows outside traditional accounting areas so that current ways of operating are better understood; and
- commit to business change so that IT projects are seen as being about people not just technology.

Third, making a business case for IT projects is complicated by the frequent difficulty of articulating the base case and anticipating the monetisation of benefits without which an IT project will deliver little value. Here it may help to:

- explain the base case of doing nothing in an outward facing way that considers the actions of competitors and considers different scenarios; and
- understand monetisation and explore what is known about different approaches that the business might take to generating cash from new IT-driven processes.

Fourth, achieving the broader business change that comes with IT projects is complicated by the need to manage the demand for resources across a business. Here it may help to:

- formalise IT decision making by drawing on the emerging practice of IT governance;
- establish IT reporting structures, for example choosing whether the IT function is a service provider or a business partner; and
- manage benefits starting with the identification of specific registers of anticipated IT project benefits.

Nevertheless, the complexity of many IT projects means that successful implementation will continue to be demanding and frequently elusive.

## Looking to the future

We identify a number of steps that management can consider to support the development and improvement of measurement regimes for IT projects. In particular:

- when measuring costs, there is scope to improve records of expenditure on previous projects based on post-implementation reviews;
- when measuring financial benefits, there is scope to use real options thinking to mitigate the problems of trying to predict the ultimate consequences of decisions which can be deferred until more information is available;
- when identifying leading indicators, there is scope to make better use of business models and bring together knowledge that is widely dispersed throughout the business; and
- when reporting process measures, there is scope to link these to the financial evaluation of risk and return and incentive systems designed to encourage particular behaviours.

However, if confidence in IT returns is to improve, then more needs to be done. Although there is some strong research into measurement regimes that contain a wide range of measures, it appears to be particularly difficult to share and transfer learning and there are a number of barriers to the type of research which may help businesses improve their performance.

Case studies, in particular, can highlight practices which have helped specific businesses but the time and resources required to perform such studies present significant challenges. Furthermore, the data supporting case studies are typically not publicly available and, as a result, little challenge or critique of such studies is possible, reducing their perceived credibility and the validity of their conclusions.

Given the importance of IT investment to the success of businesses and the wider economy, there is a need for further learning through a range of interdisciplinary academic research, continuing debate and sharing of knowledge and experience. Repeated project failures cannot be attributed simply to poor management. Achieving value from IT projects is a major and difficult endeavour which demands serious analysis.

While we highlight a number of possible management practices to address specific challenges of IT projects, we do not promote any single approach. Different businesses will develop different approaches based on their specific needs and we aim to provide opportunities for all ideas to be freely discussed. To help encourage this, research questions are presented around the four main themes of this report: developing a measurement regime; understanding the business; generating ideas for value creation; and managing implementation.



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