



In Search of IT ROI

How does Information Technology Contribute to Business Performance?

A White Paper by *ITCentrix*

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For decades, IT and business executives have debated the merits of technology investments. Influential studies emerged in the 1980's (e.g. Steven Roach, 1987) largely in response to perceived competitive problems in the United States vis a vis less IT-oriented Japan. These studies introduced the idea of the “productivity paradox” citing falling U.S. worker productivity in the face of ever-increasing IT investments. Overall, confidence in IT among business executives began to wane.

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In the 1990s, however, investments in desktop productivity tools began to change the way IT was viewed. Important work by academics (e.g. Erik Brynjolfsson and Lorin Hitt, 1996), demonstrated that due to competitive pressures, productivity gains show up in “consumer value” rather than profitability. IT ROI issues faded away in the late 1990s/early 2000s but the Internet meltdown has spurred new interest in IT return. While hard ROI is still required, the marketplace increasingly recognizes the need for “soft” metrics in line with Brynjolfsson and Hitt's now common sense argument.

Interest in IT ROI has re-emerged in a marketplace where:

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- According to the U.S. Department of Commerce, IT now accounts for nearly one half of all capital spending in the U.S.
- As reported by numerous research firms, a high proportion of IT projects (40%+); fail to deliver promised business results
- Nearly 90% of CEO's surveyed by Darwin magazine cite increased employee productivity as their top priority
- 86% of IT professionals surveyed by CIO magazine believe measuring IT value is important
- Only 30% of these same IT professionals believe that IT is perceived as a value (versus cost) center in their organizations, and only
- 10% feel their IT ROI measurements are reliable



ITCentrix studies show that on average, for every dollar spent on IT, about six dollars is created in organizational value.

Regardless of which technique is used, the jargon of value measurement can be intimidating, making simplicity a virtue for any approach.

Background

Most people don't view IT in value terms, they think of IT as a cost center. IT budget, total cost of ownership (TCO), and IT spending are concepts typically associated with IT.

Accounting for costs is vital but insufficient for delivering business value. Focusing on value means measuring factors like productivity, revenue, headcount, customer satisfaction, market share, cycle time and risk reduction. ITCentrix studies show on average, for every dollar spent on IT, about six dollars is created in organizational value. The bottom line is that optimizing IT spending means understanding the business.

There are numerous approaches to quantifying ROI from the highly scientific to the purely subjective. Virtually all organizations can claim some use of one or more of the following approaches:

- Variance Approach – Examines changes before and after an IT investment
- Cost/Benefit Analysis – A simple summing of measurable costs and benefits
- Financial Methodologies to measure the rate, size and timing of Benefit - Return on Investment (ROI), Internal Rate of Return (IRR), Net Present Value (NPV) and Payback Period
- Economic Value-Added – Measures the return -on and cost -of invested capital
- Real Options -- Quantifies the value of flexibility and/or potential results
- Statistical Methods - Employ correlation and regression analysis to compare various factors
- Balanced Scorecard - Integrates financial, customer, internal company, and other perspectives to align initiatives
- Value Chain Analysis – Michael Porter's approach applied to affect alignment of IT, competencies, and processes
- Surveys -- Recognizes the critical role of subjective constituency evaluations.

Regardless of which technique is used, the jargon of value measurement can be intimidating. This makes simplicity a virtue for any approach.

This paper presents a simple and effective approach to measure the business value of IT investments. The following issues will be addressed:

- What are the four questions every IT executive should be able to answer about value?

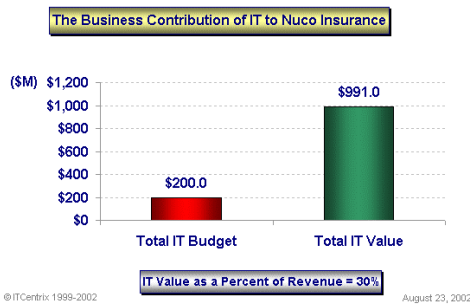
- What are the major dimensions of IT value measurements?
- How can benefits beyond costs be calculated and included in business cases?
- How are these concepts being applied to improve IT portfolio performance?

Four Questions Every CIO Should Answer...

When it comes to measuring value, IT executives should be able to answer four important questions about their IT investments:

- For the investment made in IT, what is the return to the organization (in dollar terms)?
- What applications in the portfolio are delivering that value?
- How does my organization's IT value delivery compare to others in similar industries?
- What incremental investments will optimize the value of the portfolio?

Figure 1 –Return on IT Budget



Most organizations can come up with an IT budget figure. But when it comes to the dollar return on that investment, typically these figures are difficult to derive.

Figure 1 depicts two data points, IT budget and total value returned for investment. It addresses Question #1: ***“For the money invested in IT, what is the business value return to the organization?”*** Calculating the budget figure is reasonably simple. But where does the value come from?

Measuring Value Beyond Costs

This paper examines two value dimensions that impact measurements as shown in Figure 2: 1) The IT benefits, and 2) The business benefits. IT benefits typically receive the attention. Total cost of ownership (TCO), faster batch performance, reduced backup windows, simplified management, and so forth. All are important factors, but they don't directly do much for the business (e.g., the productivity of the employees outside of the IT department).

Consider the following example. A company with \$1B in revenue and 4,000 employees spends approximately 5% of revenue on IT (about \$50M) annually. A 1% reduction in IT TCO at this company will deliver a \$500,000 bottom line savings impact. However, making its 4,000 employees 1% more productive will yield \$10M in value to the organization. The bottom line is IT investment decisions must consider the dimensions of both cost and business value.

The challenge becomes how to measure the IT contribution to employee productivity. Productivity is output produced per unit of input. A straightforward way to normalize productivity measurement

Figure 2 –Dimensions of IT Value

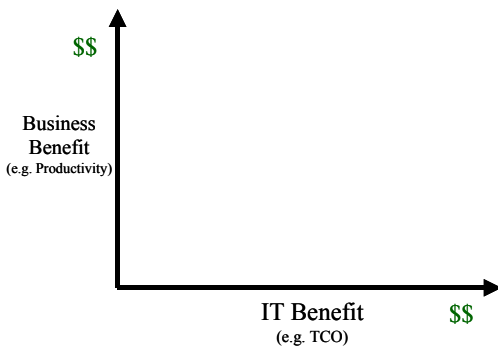
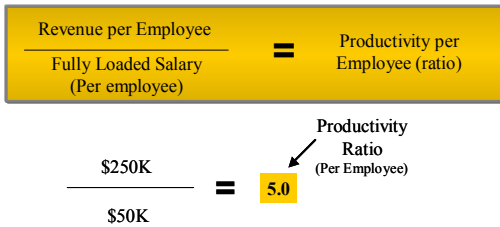




Figure 3 – Productivity



across organizations is to use revenue per employee as the key metric. Dividing revenue per employee by the average fully burdened salary per employee yields a ratio. This ratio is the average, per employee “Productivity Ratio” for the organization as a whole.

Figure 3 shows the calculation for the following company:

- \$1B in annual revenue;
- 4,000 employees
- Fully burdened salary per employee = \$50,000

At \$50,000 burdened salary per employee and \$250,000 in revenue per employee, for every \$1 the organization pays an employee it expects an average return of \$5 in revenue terms. ITCentrix research shows that the average medium- to large--sized corporation in the U.S. generates about \$255,000 per employee and pays its employees approximately \$54,000 in fully loaded salary.

In general, such productivity figures are considered empirical “facts” within an organization the financial department can readily provide. Figure 4 shows data from the ITCentrix ValueBase and the U.S. Census. The data indicate per employee productivity ratios in various industry examples. Importantly, different industries will have different productivity metrics. Insurance carriers, for example tend to have very high productivity per employee ratios while services-oriented industries will display much lower figures.

A higher figure across industries is not necessarily an indicator of “goodness,” rather it is a benchmark within an industry that can be used as a guidepost. Comparisons across different industries may be in fact, largely meaningless, as each industry displays different economies, business models, and competitive factors.

Figure 4 – Industry Productivity Ratios*

Industry	Productivity Ratio*
AG. SERVICES, FORESTRY, FISHING	2.7
CONSTRUCTION	5.0
FINANCE	6.7
MANUFACTURING	6.4
MINING	6.7
NONCLASSIFIABLE ESTABLISHMENTS	4.3
REAL ESTATE	3.5
RETAIL	7.5
SERVICES	2.6
TRANSPORTATION, COMM., UTILITIES	5.9
WHOLESALE	21.1
INS: MEDICAL SERVICE AND HEALTH INSURANCE	15.8
INS: OTHER INSURANCE CARRIERS	15.1
INS: INSURANCE AGENTS/BROKERS	2.8
Average	6.6

*Per Employee
Source: ITCentrix ValueBase(TM) and U.S. Census Data

The productivity of users, while they are actively using applications, is the key to understanding the productivity impact of IT.

Measuring the Contribution of IT

To apply the concept of productivity to measure the impact of IT on the business, we create a link between IT and the business through IT applications. The process combines empirical data related to overall organizational productivity (as calculated above) with subjective knowledge of how IT applications contribute to productivity.

The approach relies on the following basic premise:

Users of applications are the prime drivers of IT value – The productivity of users, while they are actively using applications, is the key to understanding the productivity impact of IT. *The bottom line is understanding users and how they exploit applications enables IT value measurements.*

Applying a productivity ratio to establish IT value requires answering the following questions:

- **What portion of employees’ time, on average, is spent actively using IT applications?**

Studies by ITCentrix demonstrate that on average, across a wide range of industries, employees that use computers spend about one third of their time actively using IT applications.

- **What is their productivity while using these systems?**

The first question can generally be addressed by simple observation, discussion and common sense. Studies by ITCentrix demonstrate that on average, across a wide range of industries, employees that use computers spend about one third of their time actively using IT applications. This figure can be derived through discussions or more detailed user surveys for individual organizations and departments.

The second question, while more subjective in nature, can be measured by surveying different constituents within an organization (e.g., users, line of business managers, and senior executives). The results of this input can be used to create an “organizational consensus.”

Figure 5 – IT Value Contribution

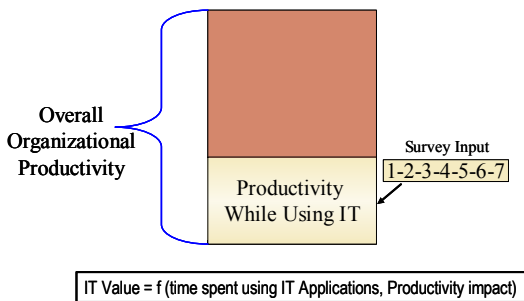


Figure 5 describes the concepts in detail. The idea is to ascribe a portion of the overall organizational productivity to IT in a “value chain” manner. The approach is to assess overall organizational productivity (as shown in Figure 3), identify the portion of employees’ time spent using IT, and assign a productivity ratio for employees while using IT applications. This ratio can be derived using a 1-7 scale addressing the following question:

On a scale of 1 to 7 (low to high where 4 is average), what is the contribution of IT to an active user’s productivity?

The resulting answers can be applied using a set of pre-determined “governing rules” where, for example, an answer of 4 multiplies the company average productivity by 1 (i.e., uses the overall average), a 7 multiplies the company average by 1.75 and a 1 multiplies the company average by 0.1.

Simply stated, the value of IT is a function of the time employees spend using IT applications and the impact of that usage on their productivity.

By applying the subjective notion of productivity, while users are actively using IT, to establish overall IT value, the value of IT applications can be simply calculated by multiplying user costs (# users * percent time spent using IT * fully burdened salary) by the derived productivity ratio while using IT. ***Simply stated, the value of IT is a function of the time employees spend using IT applications and the impact of that usage on their productivity.***

The Net Business Contribution of IT

Once established, the IT and business costs of delivering that value can be subtracted from the total value of the application portfolio to determine Net Application Value (NAV). NAV represents a key metric that can be measured on an ongoing basis, and importantly, used to compare project initiatives to the base portfolio.

The IT and business costs netted out include:

- IT Costs -- Hardware, software, networking, staff, services
- User costs -- The fully loaded costs of active users (FTE users)



- Unavailability -- Downtime costs (application value lost due to downtime), including disaster exposure (probability adjusted)
- Inflexibility -- The opportunity cost of application maintenance

This approach addresses two major problems found with most IT ROI measurements: 1) NAV allows apples-to-apples comparisons that highlight the IT-only portion of benefit (as opposed to non-IT contributors like new sales training or a new channel partnership) and; 2) NAV can be easily measured on an ongoing basis (e.g., to see if the projected ROI actually occurred) because the IT benefit is not “spammed” in with other business benefits.

Building Application and Project Portfolios

The next step is to assess the overall contribution of IT in two areas:

- Applications in the current portfolio
- Incremental projects or functional enhancements to existing applications

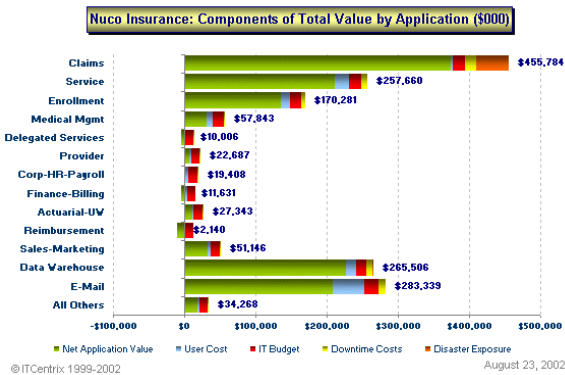
Importantly, research shows that 65-75% of IT spending is targeted to existing systems and the remainder to incremental projects.

Importantly, research shows up to 80%* of IT spending is currently targeted to existing systems and the remainder to incremental projects (*The Gartner Group). As such, it is critical to ground analysis in the base portfolio and then analyze proposed projects.

To apply these principles to evaluate the application portfolio in a more granular fashion, a similar value analysis (IT usage and impact) can be performed on an application-by-application basis.

Figure 6 shows a portfolio view of applications with the key IT and business costs separated. It addresses Question #2: **“What applications in the portfolio are driving value?”** The process of building an application portfolio should involve the following steps:

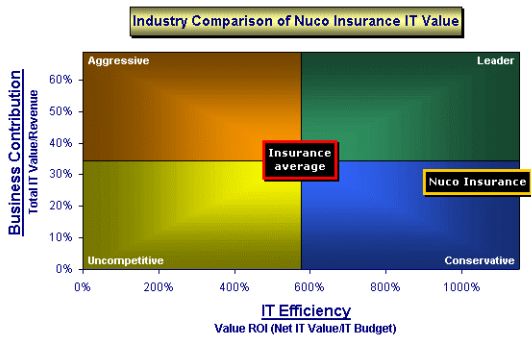
**Figure 6:
Which Applications Drive Value?**



- “Chunk” applications in logical “suites” grouped by business process, product line, portfolio manager, or other logical construct. This will minimize complexity and facilitate better communication of results;
- Perform a granular analysis on each application assessing usage and usage impact;
- Allocate IT and business costs by application and “Net Out” the business value;
- Analyze application in a quadrant chart or other comparative tool to gain consensus on the base portfolio value;



Figure 7
Value Comparisons



Once a base portfolio is established, Question #3 **“How does my organization compare?”** can be addressed with adequate data sources.

Benchmark comparisons can be made using firm level data similar to Figure 4 above and adjusting to reflect IT usage and impact by industry and ultimately application. Figure 7 shows a comparison of a hypothetical company to the industry average, measuring value in the two dimensions addressed by this paper.

The horizontal axis represents IT efficiency expressed in simple ROI terms (Net Value divided by IT Budget). The vertical axis represents Business Benefit also expressed in simple ROI terms (Total Value as a percent of company revenue).

An organization is plotted on the quadrant based on its relative value position in a specific industry. Leaders fall in the upper right hand quadrant (those that efficiently deliver high business value). Organizations that are efficient from an IT perspective but yield less business benefit (“Conservative”) are placed in the lower right and organizations that may not efficiently manage IT costs but yield good business benefits (“Aggressive”) are placed in the upper left.

The quadrant is a useful way to visualize an organization’s position and project the impact of its strategic alternatives.

Question #4: **“Which investments will optimize portfolio value”** can be addressed by understanding the business impact of new investments (projects). Specifically, IT value for projects is measured by four factors, including:

- Improved productivity
- Incremental revenue generation
- Lower business costs
- Reduced risk

As with the base portfolio, productivity is measured by assessing Revenue per Employee (or budget per employee in a non-profit situation). Forecasted productivity improvements are applied to investments and can come from improving the productivity of users while they actively use applications (e.g. delivering better application function) or indirectly improve productivity for the non-users (i.e. overall organizational productivity). Cycle time reductions (reducing elapsed time to perform a task) can also be separately measured in productivity terms (doing the same with less or doing more with the same).

Revenue generation enabled by IT is straightforward and needs little explanation. Frequently, Web-based initiatives involve forecasting and assigning direct revenue affects to value measurements. The techniques used to evaluate external applications are similar in concept (i.e. the value chain approach) but often require direct customer/partner (versus internal user) feedback.



Figure 8 – Project Financials

Project Financials by Year for Any Organization

Project	Year	Data				
		NAV	NPV	ROI	IRR	Break Even in Months
Web Enablement	3	\$3,400,000	\$1,888,000	147%	39%	22
	5	\$7,360,000	\$5,060,000	377%	41%	22
Sales Automation	3	\$2,550,000	\$1,416,000	110%	29%	12
	5	\$5,520,000	\$3,795,000	283%	30%	12
Integrated Financials	3	\$2,091,000	\$1,161,120	91%	24%	16
	5	\$4,526,400	\$3,111,900	232%	25%	16
Data Warehouse	3	\$1,191,870	\$661,838	52%	13%	14
	5	\$2,580,048	\$1,773,783	132%	14%	14
SAN consolidation	3	\$ 341,000	\$(370,000)	-54%	0%	54
	5	\$ 744,000	\$(112,000)	-14.7	0%	54

Costs include IT costs (hardware, software, services and staff) and business costs, including user costs, one-time costs, downtime reduction, and reduced opportunity costs (e.g., reduced application maintenance costs).

Risk reduction can come from reducing the probability of a business disaster or a security breach.

After a project assessment is performed, a cash flow analysis provides financial metrics such as Internal Rate of Return (IRR), Net Present Value (NPV) and Break Even Period – Figure 8. This allows a proper financial analysis to be performed. Risk is also factored into the analysis and adjustments to financials are made accordingly.

Executive Actions and Conclusions

Most organizations do not take a ‘Value View’ of their IT portfolio. But ignoring the value component can lead to decisions that may not be best for the business. By combining empirical organizational information (financials, user counts, budgets, etc.) with subjective knowledge of the contribution from applications to productivity and other business benefits, organizations can objectively identify those assets contributing maximum business benefit.

The following points can serve as guidelines to implementation:

- Take a first pass at establishing a base portfolio value within the IT group
 - Fine--tune the approach as appropriate
 - Perform basic benchmarking
 - Extend the approach to include project assessments
- Establish a value framework and methodology and test with LOB and Senior Executives
- Begin rolling out the tools and training
- Implement an IT Value measurement and reporting system that can serve as a component of governance systems and decision-making

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