How do I measure the Value of IT?

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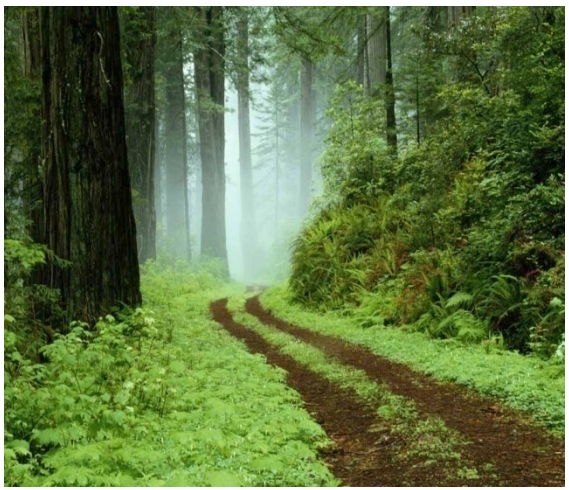
Introduction

- The phrase, “Beauty is in the eye of the beholder,” could equally well apply to value as to beauty.



Presentation Objectives

- This webinar reviews the most frequently used financial and non-financial measures of IT value.
- All measurements, including IT value measurements, are only useful and worth making if they are used to guide decisions.
- This means that all measurements have to be available to or, better, regularly presented to decision makers.
- In the context of businesses making decisions based on the value of IT, this means that IT must regularly present its measurements to the business decision makers.
- Different decision makers require different information and different levels of detail of the same information. The webinar will propose some ways of presenting value information for decisions.
- This webinar is based on Chapter 2 of "The Business Value of IT" by Michael D.S. Harris, David Herron and Stasia Iwanicki (Auerbach, March 2008).
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What is Value?

- The Merriam-Webster online dictionary offers the following seven definitions for the term “value:”

1 : a fair return or equivalent in goods, services, or money for something exchanged

2 : the monetary worth of something **:** MARKET PRICE

3 : relative worth, utility, or importance <a good *value* at the price> <the *value* of base stealing in baseball> <had nothing of *value* to say>

4 : a numerical quantity that is assigned or is determined by calculation or measurement <let *x* take on positive *values*> <a *value* for the age of the earth>

~~**5 :** the relative duration of a musical note~~

~~**6 a :** relative lightness or darkness of a color **:** LUMINOSITY **b :** the relation of one part in a picture to another with respect to lightness and darkness~~

7 : something (as a principle or quality) intrinsically valuable or desirable <sought material *values* instead of human *values* -- W. H. Jones>

What is Value?

Value	=	Benefits	-	Costs
		* Product Capability * Time to Market * Timeliness * Product Evolution		* Development * Rework * Knowledge Recovery

Source: Grady, R.B. *Successful Software Process Improvement*" 1997, Prentice Hall.

Why is it important to measure IT Value?

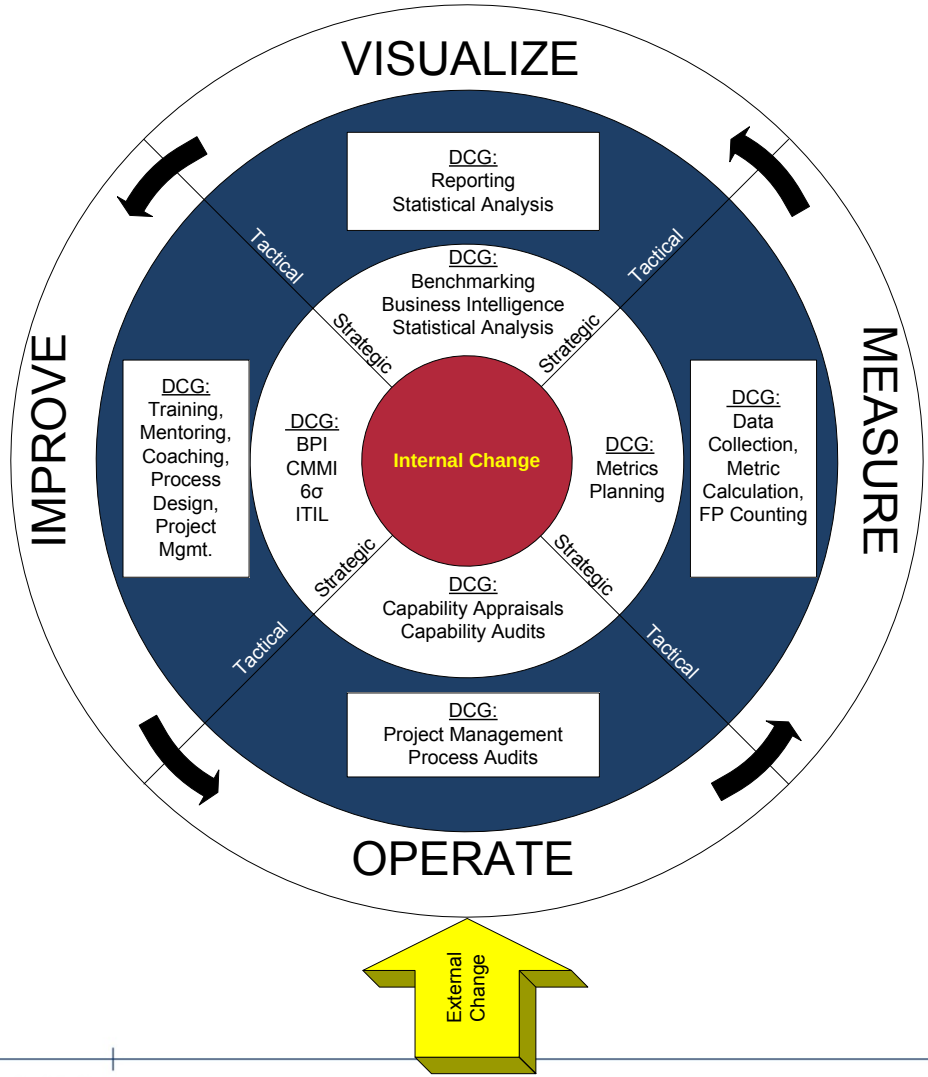
- All eyes are on IT investments.
- IT consumes significant resources relative to other functions because of the cost to operate and manage the IT infrastructure and the ubiquity of IT throughout most modern organizations.
- Even if businesses minimize their IT-supported innovation (a risky strategy), there are ongoing costs for networks, systems, applications and a highly skilled workforce.
- How do you know if you are getting value for money from your IT investments?
- How can you maximize the likelihood of success in your IT investment choices?
- How can you tell if you need to make as much investment in IT as you are making now?

Why is it a challenge to measure IT Value?

- The challenge is to characterize how an IT investment - for new capabilities or for "keeping the lights on" - helps the organization that bears the cost to achieve its organizational objectives and financial performance targets .
- IT must consistently deliver value in economic terms that make sense to its organizational customers.
- Smarter IT executives have realized that, generally, IT alone does not create value.
- In truth, value emerges from the impact of IT on business processes.
- Ben-Menachem and Marliss reported in 2005 that:

  "Many analysts are inclined to measure corporate maturity by the percentage of revenue spent on IT. This percentage has grown steadily over the past two decades. In fact, IT's size tends to grow commensurate with the maximum that the organization's resources can support."
- This common metric of IT expenditure as a percentage of revenue varies widely by industry with a range in 2004 of 1.7% (Oil and Gas Production) to 7% (Financial Services and Banks).
- Mark Lutchen reminds us that "The reality is that the right IT metrics are neither the same nor relevant for every organization."

Summary – Value Visualization℠



Two Categories of Value Metrics for IT

- Financial Metrics
  - Total Cost of Ownership
  - Return on Investment
  - Economic Value Added
  - Real Option Valuation
  - Return on Assets
  - Return on Infrastructure Employed
- Non-Financial Metrics
  - Multidimensional Value
  - Strategic Value

  - Note: Net Present Value!

Financial Metrics for IT – Total Cost of Ownership (TCO)

- TCO came to prominence in the 1990's
- Seeks to capture all the costs of an IT asset from initial purchase through implementation and operation to maintenance and "end of life" costs.
- Although this is a cost-based approach which does not equate to value, it can be useful for measuring IT value because:
  - It allows comparison of alternative implementations that will meet the same business need and, presumably, have very similar values to the business.
  - If TCO (Option A) << TCO (Options B, C, D) then it represents better value for money.
- By including such considerations as training costs, security costs, scalability costs and the costs of reliability deficiencies, TCO incorporates perspectives that are not purely financial.
- One limitation of TCO is that it involves predicting future costs. This limitation can be minimized over time by tracking actual costs but, by then, the investment decision has been made.

Financial Metrics for IT – Return on Investment (ROI)

- ROI is calculated as the revenue that the business generates or the costs that it saves in return for the investment it is making.
- For an IT investment to be approved by the business, the IT Providers and the business must work together to demonstrate that the business will get its money back in an acceptable period of time (the payback period) with, ideally, a subsequent period of profitability.
- In practice, ROI is typically expressed as a percentage of the investment, either annually or over the duration of the project with the cash flows rendered as net present values.
- Typically, the assumed discounting rate is called the internal rate of return (IRR) and is linked to the cost of capital of the business or the amount of interest the business will pay to borrow the money to make the investment.
- Acceptable IRR's and payback periods vary immensely from business to business but an IRR of at least 20% and a payback period of 1-3 years would be a reasonable starting point for a discussion.

Financial Metrics for IT – Return on Investment (ROI) (Continued …)

- ROI is very widely used to justify IT investments, particularly for new projects.
- Although there is still the problem of predicting the future, ROI provides a good way to compare the financial value of very different projects and also provides hurdles, through the payback period and IRR, that quickly cut off further, costly, consideration of some projects.
- One practical problem with the use of ROI is that organizations often have good systems established for making their investment decisions using ROI but may have weak systems for monitoring the actual ROI achieved to either terminate the project or use the historic data to inform their future investment decisions.
  - Are the ROI numbers that we are basing our decisions on realistic?
  - For a single project, if the ROI is less than expected, at what point should the business cut its losses and cancel the project?
  - Over a period of time, if the ROI for many projects is consistently more or less than the current target, then the IRR could be adjusted accordingly.
- Another practical problem with ROI is that cost savings must be in real money rather than theoretical "efficiencies." For example, a projection that an IT investment will save the business 10% of staff time is only a real cash flow if it results in the employment of 10% less staff (in that area).

Financial Metrics for IT – Economic Value Added (EVA)

- EVA starts with the assumption that the organization exists to provide economic value to its shareholders.
- This may not be entirely true for not-for profit organizations, but the approach still has value.
- The calculation and comparison of EVA is very similar to ROI except that the benchmark used for making investment decisions is not the IRR but the opportunity cost of using the money to make other business investments, (e.g. leaving the money in the bank rather than funding projects).

Financial Metrics for IT – Real Option Valuation (ROV)

- ROV is a more complex technique than the methods described so far.
- It is based upon the financial estimation techniques used in stock option theory.
- Essentially, ROV is used to modify the ROI calculation by taking into account the value that the current project could contribute to future projects.
- This approach typically enhances the ROI of projects such as IT infrastructure because:
  - The cost of implementing a whole new infrastructure for just one project for one business unit's needs is so burdensome that no one business unit could ever justify starting the new infrastructure on its own.
  - BUT the overall value of the new infrastructure to all the business units in the organization could be huge.
  - ROV provides a technique for justifying that first project based on the future derived value.

Financial Metrics for IT – Return on Assets (ROA)

- Widely used to measure the performance of companies
- Can also be applied specifically to the IT assets.
- For the organization, ROA is calculated by dividing the net income by the value of the assets being used to generate the net income.
- Similarly, ROA for IT assets can be calculated by isolating the IT-specific assets from the organizational assets and the net income due to IT assets from the overall net income.
- This can be hard to do and the accounting systems need to be set up appropriately to provide any chance of achieving this on a repeatable basis.
- IT's contribution to the value of an organizations value (as Financial Assets or otherwise) can be considered in a broader context. In his book, "Software as Capital," Baetjer argues that economic capital goods embody, or are, knowledge. He goes on to argue that, as an embodiment of knowledge, software can be considered as capital.

Financial Metrics for IT – Return on Assets (ROA)
IT Asset Valuation

- Ben-Menachem and Marliss describe in some detail the importance of IT asset valuing and offer a three-step process for calculation:
  - Categorize all items, creating groups
  - Assign values to each item
  - Classify each item into one of three categories, say A, B, and C, where A-level items represent the top 20% of items in terms of value and C-level items represent the bottom 20% of items in terms of value.
- Clearly, both Class A and Class C items demand significant attention!
- Of key importance in this process is the need for a working IT-asset inventory system that contains all of the IT assets (hardware and software) used in the organization.
- The Information Technology Infrastructure Library (ITIL) provides details of how such an IT assets inventory ("Configuration Management Database" or CMDB) should be established and used as part of its Configuration Management process.
- The Capability Maturity Model Integrated (CMMI) also contains a configuration management process area.
- For more information on ITIL and CMMI, go to www.davidconsultinggroup.com.

Financial Metrics for IT – Return on Infrastructure Employed (ROIE)

- ROIE is similar to ROA but it focuses on IT services rather than IT assets.
- With ROIE, IT service cost (including depreciation) is the basis for computing a return.
- While ROIE can be used for a single project, it works best when calculated for aggregations of projects. For example, it might be used to compare the performance of different IT Providers in-house or outsourced.
- ROIE might be improved by providing the same IT service at a lower cost or by containing the cost growth of providing a particular IT service to less than the rate at which the organization's net income is growing.
- Interestingly, if the organizations net income is shrinking in a particular period, the ROIE will worsen if nothing changes on the IT services. To maintain or improve ROIE under this scenario, the IT Services costs must be flexible enough to, perhaps, reduce the quantity of the service being provided.

Non-Financial Metrics for IT

- The most frequent criticism of purely financial valuation methods is that they provide no measure of the value of the activities in the context of the business strategic goals.
- For example, the ROI for an IT investment is the same in a business pursuing a customer intimacy strategy whether the investment will improve customer intimacy or destroy it.
- The need for a broader measurement of the strategic and tactical value that IT can bring to the business has lead to the consideration of multidimensional IT valuation approaches that include other aspects of value in addition to the financial valuation:
  - Multi-criteria Approaches
  - Portfolio Management Approaches
  - Strategic Framework Approaches

Non-Financial Metrics for IT – Multi-Criteria Value

Method	Description
Information economics (IE)	IE Provides a scoring mechanism taking into consideration 10 variables: 6 business domains and 4 technical domains. Business domain includes enhanced ROI and risk and business alignment issues. Technical domain includes architecture alignment and technical risk factors.
Applied information economics (AIE)	Built around principles of measurement theory, decision theory and actuarial sciences, AIE reduces each variable to a range of ROI outcomes with assigned probability. The impact of all risks is quantified in this way, along with intangible benefits. The result is a probability distribution for ROI e.g. 75% chance of an ROI of 30%.
Total economic impact (TIE)	TEI calculates traditional costs and business benefits using financial methods, adds a quantitative measure of benefits related to future flexibility based on ROV or other techniques and then adjusts the probability distribution based on risk factors. The result is an ROI that has taken into account real options and risk.
Total Value of opportunity (TVO)	TVO combines quantitative and qualitative measures. Costs are derived using a TCO approach. Metrics convert IT benefits into bottom line business results in three main categories: demand management, supply management and support services. The TVO methodology considers four other qualitative measures including risk, architecture alignment, business process impact and strategic business alignment.

Source: McShea, M., *IT Value Management: Creating a Balanced Program*, November/December 2006, IT Professional, IEEE.

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Non-Financial Metrics for IT – Portfolio Management Approach

Method	Description
Giga Information Group portfolio framework	This method categorizes projects on two axes: IT impact to operations (low to high) and IT impact to the business (low to high). Quadrants: In terms of IT's role (operational impact and business impact), projects are either support, factory, strategic or turnaround. Allocating IT projects to quadrants reflects IT's role in the organization and strategy.
Ross and Beath investment quadrants	This method categorizes projects on two axes: technology scope (infrastructure or business applications) and strategic focus (short-term profitability or long-term growth). Quadrants: Infrastructure projects are renewal (short-term-profitability focused) or transformational (long-term growth focused). Business applications are process improvements (short-term-profitability) or experiments (long-term growth).
for Information Systems Research portfolio pyramid	In this technique, four defined asset classes focus on risk versus reward and IT projects' varying profiles along these lines. Investment profiles are geared toward agility versus cost-driven strategies. Rather than a quadrant-based approach, a pyramid is constructed with infrastructure investments at the base and supporting transactional projects (internal business process focused) at the next layer. Informational (management decision support) and strategic projects (external market-driven) form the pinnacle.

Source: McShea, M., *IT Value Management: Creating a Balanced Program*, November/December 2006, IT Professional, IEEE.

Non-Financial Metrics for IT – Strategy Value

Method	Description
Balanced Scorecard (BSC)	The BSC has four layers: financial, customer, business process and learning and growth (sometimes referred to as the "people" layer). Each layer has specific, company-unique strategic objectives with defined metrics that are linked to other objectives in other dimensions to reflect strategy. A strategy map is constructed by linking objectives to show cause and effect i.e. "linkage."
IT Scorecard	Van Grembergan describes four categories: user orientation (user satisfaction), operational excellence (efficiency in development and operations), business contribution (financial) and future orientation (approach to skill-set development and innovation). Critical success factors identified in each are based on business strategy.

Source: McShea, M., *IT Value Management: Creating a Balanced Program*, November/December 2006, IT Professional, IEEE.

Non-Financial Metrics for IT – Strategy Value – MMF's

- Denne and Cleland-Huang's introduce the concept of a "Minimum Marketable Feature" (MMF) defined as "components of intrinsic marketable value" or units of software value creation.
- Candidate MMFs are identified through the cooperative efforts of the business and IT groups by considering the application domain, shareholders' needs and constraints and the current business context.
- To derive the value of MMFs, Denne and Cleland-Huang ask some key questions:
- What type of value will this MMF return?
  - Savings in resource costs?
  - Increased sales revenue?
  - Improved customer retention?
- Can the value of the MMF be expressed in monetary units (e.g. dollars)?
- If not, how can intangible benefits be justified or compared?
- What are the risk factors associated with this MMF?
- What cost and effort is required to develop this MMF?
- What is the anticipated time line to generate the MMF and realize the associated benefits?

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Business Value Measures for IT

Technology investment	Categories of IT Investment	Business Value Characteristics	Typical Business Value Outcomes	Key Business Value Measures
… to gain competitive advantage or to position the company in the market place to increase market share or sales	Strategic	Competitive advantage Competitive necessity Market positioning Innovative services Increased sales	50% fail Some spectacular successes 2 to 3 year lead time Higher revenue per employee	*Business Unit Financial:* Revenue Growth Return on investment Return on assets Revenue per
… for managing and controlling the organization at the business unit level (e.g. financial control, decision support, planning)	Informational	Better information Better integration Improved quality Increased control	Shorter time to market Superior quality Premium pricing Improved control	*Business Unit Operational:* Time – new product to market Sales – new products
… to process basic repetitive transactions of the company. Focus is on high-volume transactions and cost reduction.	Transactional	Increased throughput Cost reduction	25% to 40% return Higher ROI/ROA Lower risk Improved control	*Business Unit IT Application:* Time – application implementation Cost – application implementation
… to construct foundation IT capability (e.g. PCs, servers, networks, maintenance, help desks).	Infrastructure	Standardization Flexibility Cost reduction	Utility-type reliability Supports and facilitates change Creates compatibility	*Enterprise-wide IT Infrastructure:* Infrastructure availability Cost per transaction Cost per user

Source: Lutchen, M. D., *Adapted from "Managing IT as a business: a survival guide for CEOs*", 2004, PricewaterhouseCoopers LLP) John Wiley & Sons, Inc.

Using IT Value Measurements for Decisions

- Dashboards
- The Business Case
- Value Visualization

Using IT Value Measurements for Decisions – Dashboards

- A useful tool for presenting measurement information to managers at different levels is the “dashboard.”
- This tends to be an on-screen presentation of trend charts, typically showing the four to ten most important measurements for the viewing decision maker.
- Often, the charts represent an aggregation of other measurements so that the decision maker can “drill down” to greater levels of detail if needed.
  - For example, the CEO may start by looking at a dashboard reflecting measurements across the entire organization.
  - If the CEO notices a significant trend change in one of the measurements, say sales revenue has dropped this month, additional detail is available on that chart.
  - By drilling down, an additional, more detailed screen would show sales revenue for each of the business units showing if sales were slightly lower across the board or if one particular business unit had a bad month.
- When businesses look at dashboards at the highest level, it is important to understand that IT value will be only one of a number of measurements that will be displayed.

Using IT Value Measurements for Decisions – The Business Case

- The value of IT to the business is very dependent on the business value priorities (e.g. operational excellence, customer intimacy, product/service innovation). Different business units may have different priorities.
- What common management tool applies internally valid measures of value to new investments? The business case.
- The business case for any new project (including non-IT projects) should include quantification of the value of the project to the business in terms of tangible and intangible benefits.
- It should be possible to track the value of these benefits in monetary units against the project costs throughout the life of the project.
- The cost of measuring, monitoring and reporting should be included in the business case at least through to the projected date when the expected and agreed return is achieved.
- This approach to measuring IT value is so simple that it is bound to raise a number of questions:

Using IT Value Measurements for Decisions – The Business Case – Q&A

- What if the benefits are all intangible and cannot be easily measured?
  - The advisability of starting the project should be seriously questioned.
- This might be good for all new projects but what about our legacy systems?
  - There may be a number of old business cases available.
  - If not, The sum of all the legacy systems in a particular area provide some percentage of the business value being generated today (ignoring all new projects). Hence, a one-off legacy business value calculation based on some percentage of revenue minus costs should result in a historic IT value measure. The components of this calculation can be tracked going forward.
- If this process is so simple, why don't we track the "actual versus planned" figures for business case returns today?
  - Why indeed – it is amazing how rarely this is done when we consider just how much energy and angst goes into creating a typical business case.
- Do we really need a business case for every project? Most of them are very small.
  - The answer is "yes." There are lots of trade-offs in efficiency and effectiveness between small and large IT projects but no organization can survive with exclusively all small or all large projects. Getting the right mix and controlling the relative level of investment is an important IT Governance issue.

Using IT Value Measurements for Decisions – The Business Case – Q&A

- Isn't this just Earned Value Analysis (EVA)?
  - No. EVA is a very useful tool in development projects because it gives an indication of the progress of the project based on the completion status of the various sub-components of the project. However, typically, EVA stops when the development project is completed with 100% of its earned value delivered. A business case is much more about the real cash flows after the project is developed and implemented in operations – the cost of development is just one part of the investment in the project.
- This use of the business case for new projects is compelling but what about the recurring IT expenditure to "keep the lights on." How can we construct business cases for the existing IT spend as opposed to the new IT spend? How can we compare the two?
  - In considering the value to the business of continuing to spend on existing IT, the business needs to capture the cost avoidance benefits of the expenditure. In considering the value of another year's expenditure on legacy systems, the business case needs to consider the cost implications of a system outage. These costs include the immediate repair costs plus the impact on revenue. For example, a one day outage of the amazon.com or e-bay websites could be caused by a simple software defect that would take a short time to detect, fix and redeploy but the lost revenue (and damage to reputation) would be huge.

Using IT Value Measurements for Decisions - Value Visualization

- Over many years, the process and measurement experts at the David Consulting Group have studied, taught, implemented and audited almost all of the process improvement methodologies and best practices that have come, gone and stayed around e.g. Six Sigma, GQM, CMMI, ITIL, and COBIT.
- With such a variety of tools available, how can you ensure continuous improvement, test for effectiveness or, indeed, test for “mission accomplished”?
- DCG has evolved the Value Visualization Framework (VVF). The framework is based on the simple philosophy that any project (in our case, process improvement and measurement projects) must deliver value and that value must be visible.
- The VVF is unique in that it takes a holistic view of the organization and facilitates the selection of the best practices (one or many) to meet the different needs of the current iteration based on clear definition of the value that can be delivered by this iteration.
- This avoids the need to “bet the business” on one particular methodology when maximum improvement, and more specifically, value can only or best be achieved by cherry picking combinations of parts of methodologies (that minimize risk) for this iteration.
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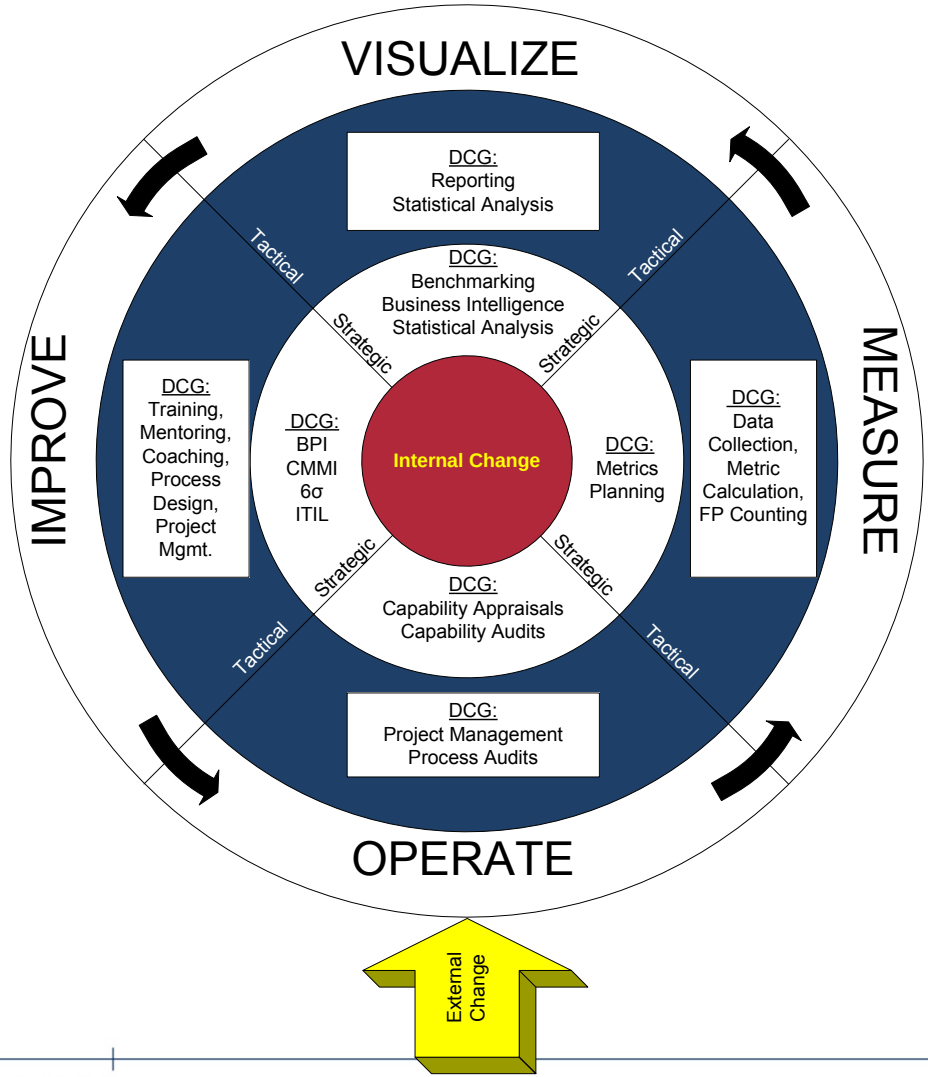
Summary – Value Visualization℠



Summary

- Clearly, there are many techniques that can be used for measuring the value of IT.
- The “right” ones are right for a particular business-IT Provider relationship.
- Business cases, or something similar, should be the vehicle for capturing the agreements between business and IT regarding how the value will manifest itself to the business, and how this value will be measured, monitored and reported.
- Any of the value measurement techniques described in this chapter can be used to facilitate regular value visualization for the business.

Questions?

- For more information:
  - "The Business Value of IT: Managing Risks, Organizing Performance and Measuring Results" by Michael D. S. Harris, David Herron and Stasia Iwanicki (Auerbach, 2008)
  - www.davidconsultinggroup.com