# Difficulties in Quantifying IT Projects with Intangible Benefits: A Survey of Local IT Professionals

Alisha Oliver
ajo6848@gmail.com
Deloitte Touché
Charlotte NC 28202

Jesse Barrick
Jbarrick26@gmail.com
University of North Carolina Greensboro
Greensboro NC 27412

Thomas N. Janicki
janickit@uncw.edu
Information Systems Department
University of North Carolina Wilmington
Wilmington NC 28403

## Abstract

As Information Technology (IT) investments increase in number/costs for organizations, the need to provide financial justification for these projects also increases. IT investments must compete with the other organization's projects for priority within the portfolio of possible strategic investments. Creating an even more difficult challenge, information technology and business unit managers often must attempt to define and justify IT project investments that have a high percentage of their return being in the form of 'intangible benefits'. This research summarizes a survey of IT professionals involved in project selection, development, justification and approval. Particular attention is given to the measurement and justification of projects where the main benefit may not be easily quantified by traditional financial measurement tools. Key findings: include the value of intangible benefits in every applicable IT project, tie intangibles to corporate strategies, and build a process for 'post' quantification of intangible benefits after a project has been implemented.

**Keywords**: IT Investment, IT Project Justification, Project Intangible Benefits

### 1. INTRODUCTION

As Information Technology (IT) investments increase in organizations, the need to provide financial justification for these projects also increases. IT must compete with other organization's projects for approval within their strategic endeavors. Information technology and organizational unit managers face a difficult challenge when they attempt to define and justify investments in IT projects that have a high percentage of their return being in the form of 'intangible benefits'. Phillips (2006)

reports that a major challenge for IT professionals is to quantify intangible benefits in monetary form.

Typically, IT projects compete for funding against non-IT projects and justification follows normal capital financial ratios justification. (Bon, Kemmerling, Pondman, 2002) Key ratios include Return on Investment (ROI), Cash Flow, Internal Rate of Return (IRR), and Payback Period. IT projects may have direct tangible benefits such as: cost savings, improvement of product quality, or increased revenue in dollars, which gives a direct cost ratio. Intangible benefits that are difficult to quantify to the organization include benefits from impact on employee morale, communication improvements, and work flow changes.

The goal of this research is to utilize knowledge from researchers in the field of IT investment and merge it with the techniques utilized by current IT professionals. The research aims to incorporate current developments in the field related to guidelines on how managers can effectively measure intangible values.

## 2. BACKGROUND AND LITERATURE REVIEW

### Intangible Benefits

A definition of ***intangible benefits*** is offered by Grembergen (2001) "indicates that there are two main intangible benefits in IT investments. The first is internal improvement or infrastructure investment and the second relates to customers." Examples of intangible benefits may include time savings for professional employees, number of retained customers, increased sales, improved customer satisfaction, and a gain in marketshare. (Grembergen, 2001) "Companies of IT services can no longer afford to focus on technology and their internal organization; they now have to consider the quality of services they provide and focus on customer relationships." (Bon, Kemmerling, Pondman, 2002)

Many information technology professionals find it difficult to justify gains in financial terms of a potential project. Chircu, Kauffman, and Keskey (2001) discuss examples of intangible benefits that are difficult to justify. These include: improvements in a competitive position, increased customer relationship strength, and changes of power in the firm's distribution and supply channels

Finding the time to investigate the potential benefits of a project should be top priority. Chircu, Kauffman, and Keskey (2001) continue, "Research suggests that to maximize the IT investments, managers need to understand the potential value first." Understanding the capacity for growth of projects can help justify the potential aspects. Project Management Institute-certified professionals (PMP), ensure this process occurs in the Planning Process Group.

Public perception of a company is very critical to the long term success of that company.. "Intangible resources are important to both company success and external perceptions of company value". (Davenport and Harris, 2004) Intangible values are important because you cannot put a price on how a company is perceived, which is something gained with trust. "How the customer distinguishes the service and what the provider thinks they supply, both largely depend on their personal experiences and expectations." (Bon, Kemmerling, Pondman, 2002). The value of intangible assets related to company perception is directly addressed by Brynjolfsson, Hitt, and Yang (2002). They looked at the relationship between innovative work practices and the stock market valuation of firms and found a positive association between them. In complement, the synergy of well-implemented IT and organizational assets is also shown by Bresnahan, Brynjolfsson, and Hitt (2002) using firm-level quantitative analysis. They stress that increased productivity requires both IT investment and innovative work practices.

Justifying intangible benefits of a project can also help companies make pronounced decisions for future information technology projects. Davenport and Harris (2004) recommend that leading companies need to take steps today to make intangible resources an element of their information, justification, and reporting approaches. They added there is an enhanced value and performance in managing intangibles and that provides executives incentives to not delay decisions based on currently assessed

intangible assets. Information technology projects cannot always thoroughly be justified by various accounting data.

Companies consider some project proposals especially if it surpasses a specific dollar return on investment (ROI). Several authors in the area of project justification conclude that ROI may not be the best method of measuring project benefits. Bharadwaj and Konsynski (1997) conclude that one problem with accounting measures; they look only at a company's past performance and do not consider the future profit. Many Japanese firms, not trusting the quality of ROI data, instead typically look at specifically related operational metrics prior to a project's implementation, then again after, to obtain the projects business impact relative to cost. (Bensaou,and Earl. 1998)

Other researchers agree that quantifying intangible values are important, but difficult for most professionals to accomplish. According to Fraumeni (2001), there is no question that knowledge and information is important, but difficult to quantify. "Very little is known about how to quantify intangibles, yet they seem to be particularly important source of market valuations for new-economy firms." (Fraumeni, 2001). She continues that more research needs to be done due to the lack of information available. Kristensen and Westlund (2003) concur, "The discrepancy between the high importance of intangibles and the general inability to measure and account for these types of assets constitutes a growing challenge for business and society, in particular within the framework of Non-Financial Reporting."

Documentation regarding intangible reporting is needed. Kristensen and Westlund (2003) argue, "Lack of reliable and relevant information on intangible assets implies there is no basis for non-financial reporting, which in turn implies that market values will change over time in a less well-founded way." The continuous reporting of intangible values is going to be necessary, in the future, for measuring success to correlate with increased monetary value. (Bon, Kemmerling, Pondman, 2002)

**Measurement Techniques**

There are many accounting measurements used for tangible values. "This points to an important difference between tangible and intangible resources-their imitability, or lack thereof." (Kline, Michalisin, Smith, 2000) Bharadwaj and Konsynski (1997) report most companies measure with traditional accounting measurements and upper management is very comfortable with those measurements. Value for an organization can come from many different areas. Bharadwaj and Konsynski (1997) continue, "There is growing evidence that IT investments are creating substantial intangible value for companies."

Most accounting measurements are not adaptable in measuring intangible values. The Project Management Institute (2004) reports, "Measuring intangibles is another old-economy problem which may be exacerbated by e-commerce and the digital economy."

Measurement techniques are another important aspect of quantifying intangible values that displayed many inconsistencies. For example, labeling intangible values as "business added value" or as a "risk" eliminates consistency and cohesion for the entire project. These techniques are not working and the industry wants more information, for a framework, outlining a description to apply regulations and structure to this difficult subject. (Bon, Kemmerling, Pondman, 2002)

**Post Implementation Review**

Post-implementation review is an area often ignored by corporations. Post implementation of a project involves the analysis of comparing actual versus monetary projections. Reviewing benefits of a project after completion allows for intangible benefits to be discovered or prove their value to the project. Because these post-implementation reviews are often ignored, new enhancement projects may be initiated at a much later date, improving or adding elements that should have been completed earlier with a formal, post-implementation review.

Since there is little documentation about the pros and cons of intangible values for an IT project, the learning curve is greatly affected. (Kristensen, Westlund, 2003) By regulating better documentation on post-implementation of projects with intangible

values, it would justify other projects future approval based on their predecessors. Standardized implementation strategies persuade upper management and investors that intangible values compete with tangible values.

## 3. SURVEY OF IT INDUSTRY PROFESSIONALS

To enhance the academic findings, this research built and conducted personal interviews with leading IT professionals in southeastern North Carolina. The survey was built as shown in Figure 1.

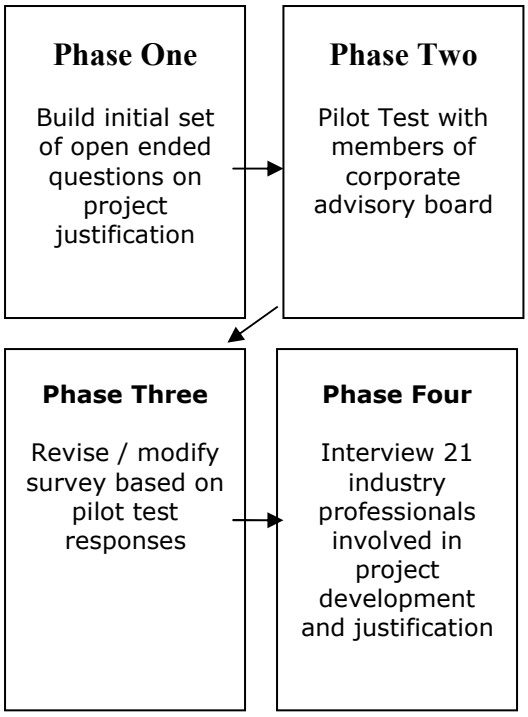


**Figure 1: Survey Development Process**

Developing the interview questions involved a multiple step process. First, the pilot test included a set of 15 questions based on the literature review of common project management issues related to project justification. The research areas used to help develop interview questions were: justification, measurement techniques, and implementation. Each area of research, such as project proposals and project justification was reviewed in order to develop the correct questions for the interviews. For example, a question was developed regarding post measurement of intangibles due to some organizations not measuring results after project completion. This was an important question because measuring a project after completion could help justify intangible benefits for future projects. One interview question was "Are you required to go back and measure tangible and intangible benefits after the project has been implemented?" Another example, based on the literature research was: "How do IT professionals develop ways to persuade top managers to commit dollars to a project that mainly has intangible values?" By measuring a project once completed, IT professionals will be able to determine how successful the intangible value related to the overall project.

Following development of the initial questions several pilot test interviews occurred to refine the interview questions. Following the interview, these IT professionals were asked to provide additional feedback on what had been missed in the original survey. The final survey questions were revised and a sample is found in Appendix A.

| JOB TITLE | PARTICIPATED |
|---|---|
| CIO | 4 |
| IT Consulting | 4 |
| IT Director | 2 |
| IT Manager | 2 |
| Retired | 2 |
| Systems and Operations Manager | 2 |
| Desktop Service Manager | 1 |
| Director Client Services | 1 |
| Founder | 1 |
| General Manager | 1 |
| Lead IT Analyst | 1 |
| **Totals** | **21** |

**Table 1. Job Titles of Interview Participants**

A total of thirty-one IT professionals were contacted and twenty-one agreed to be interviewed. The IT professionals that participated in this research study were from the southeastern North Carolina region and were involved in IT project planning and justification. Most professionals interviewed were in management positions such as a CIO or an IT manager. A digital recorder taped the conversation and handwritten notes were taken. The interviews typically

lasted thirty to forty-five minutes Table 1 details job titles of IT professionals that participated in the interviews. The participants came from various industry and organization types as shown in Table 2.

| TYPE OF ORGANIZATION | PARTICIPATED |
|---|---|
| Corporation | 9 |
| Government | 3 |
| Retired | 3 |
| Education | 2 |
| LLC 3 | 2 |
| Nonprofits | 2 |
| Total | 21 |

**Table 2. Type of Organizations**

## 4. CHALLENGES RELATED TO MEASURING INTANGIBLES

As a result of conducting the interviews several common challenges emerged while trying to measure intangible values which also matched the findings in IT project research. The problems were

1. identifying intangibles
2. developing measuring standards for these intangibles
3. incorporating intangibles into ROI
4. business unit buy-in
5. post project evaluation.

Most professionals struggled substantially to gain upper-level and business unit management acceptance of intangible values in IT project proposal.

Intangible benefits are harder to identify than a tangible benefit because of the calculable financial advantages. Developing metrics standards for projects is a complaint relayed by many interviewees. One IT professional interviewed said, "It is only natural for a benefit that does not have dollar value associated, to be hard to measure because we associate everything with money."

Several professionals have tried different methods to justify project value such as, "what will happen if the project is not approved." A CIO believes that, ". . . imagining a future for the company and visualization helps sell intangible values to upper management."

Justification can also be accomplished by using models from other companies. If a similar project was successful, the "halo effect" of success might help convince management of the potential project's value. Justifying a project requires confidence and belief by the person sponsoring the project.

Business unit manager buy-in is essential in any part of business and coordinates with upper level management and the CEO. . Their responsibilities include: revenue, profit margins, strategies, product and technology planning and staffing. When presenting information about intangible benefits, business unit managers should clarify project details to ensure they are clearly written and goals and objectives are clearly defined. The information regarding intangibles needs to be based on correct measurements and have legitimacy.

IT professionals in southeastern North Carolina were challenged by the post-project evaluation after project implementation. Many companies were understaffed and over-committed to projects and therefore, few organizations did post-project evaluations. Only seven companies of the twenty-one interviewed re-examined benefits, success, and failure of a project after completion. All companies indicated the need to evaluate a project at intervals, and especially after completion. This review helps to identify problems, trends, changes, and consequences of failure or success. Past project information can help IT professionals justify project benefits for a similar project in the future. Several IT professionals stated, "We are currently trying to establish re-examining guidelines for completed projects.

## 5. RECOMMENDATIONS / BEST PRACTICES FOR INCLUDING INTANGIBLE VALUES

Mantel and Meredith (2006) recommend a multi-step process to help achieve successful project funding as follows:

### Guidelines for Project Justification

- Establish a project council.
- Identify project categories and criteria.
- Collect project data.
- Assess resource availability.
- Reduce the project and criteria set.

- Prioritize the projects within categories.
- Select projects to be funded and held in reserve.
- Implement the process.

From both the literary research and interviews, a common list of recommendations and best practices evolved for the inclusion of intangible items in this project. These recommendations are summarized in Appendix B. The key recommendations are:

1. Consider the value of intangible benefits in every applicable IT project.
2. Business unit manager must be the project champion.
3. Have the business unit manager establish the value of intangibles.
4. Build on a history of successful past projects.
5. Tie intangibles to corporate strategy.
6. Evaluate completed projects.

**Consider the Value of Intangible Benefits in Applicable IT Projects**

Many IT interviewees' reported during the interview, "We only evaluate the tangible benefits of a project". Fifty-percent of the interviewed IT professionals reported that they do not measure intangibles because it is difficult to measure and justify. According to Curley (2005) "Even when there is no reduction in cost, significant benefits can be realized in projects that enhance customer loyalty, open up new business opportunities, or increased productivity." By including intangible benefits in every project, IT professionals will have a better understanding of the true value of the project.

**Business Unit Manager must be the Project Champion**

Every project needs to have a project champion, especially projects that have intangible values. During interviews, some interviewee's reported that project approval is based on great justification. Project champions can promote the projects intangible benefits to individuals and presentations. Getting everyone on board and excited is key to helping a project that mainly has intangible values approved.

**Have the Business Unit Manager Establish the Value of Intangibles**

Business unit manager buy-in is a key in any part of business project, but sometimes is forgotten as a main component of project justification. The business unit manager should own the process of selecting projects that have intangible and tangible benefits. The business unit manager should communicate intangible benefits tied to the company's strategy and goals. A CIO reported, "Communication is the key part of a project success." If the project benefits are communicated effectively, the project will be understood and it has a good chance of being approved. The Project Management Body of Knowledge emphasizes four main communications that should occur in a successful project: communications planning (determine information needs of the stakeholders), information distribution (timing of the information distribution), performance reporting, and to manage the stakeholders (manage issues of stakeholders and report as necessary). (PMBOK 2004, pg 221)

The business unit manager must be able to ensure that the business needs are going to be met by planning efficiently and discovering all intangible benefits. "The information on intangibles needs to be based on the right measurements, it needs to be comparable and it needs to be verifiable and understood by the users." (Kristensen and Westlund, 2003) By having the right measurements clearly defined at the beginning of the project makes the intangible values expected.

| Strategic Impacts | Measure-ment | Quantifiable Impact |
|---|---|---|
| Installation of a new high speed data transfer network | Change in data access. | Measure screen retrieval time before/after new network and 60% of productivity gains for office workers are realized |

**Table 3: Example of Intangible Benefit via productivity gain.**

Table 3 gives an example at one of the IT professional's workplace. They were installing a higher speed cable as part of a

building upgrade and the manager desired to include faster screen data retrieval as a intangible gain. Here that manager measured the retrieval times and calculated a productivity gain based on the reduced times savings of 60% of the speed increase.

**Build on a History of Successful Past Projects**

Keeping good records on the benefit (or lack) from past projects ensures more respect for future projects. "This past track record has prevented surprises, unrushed purchases by making better use of available resources, increase capacity, or control of resources." (Bon, Kemmerling, Pondman, 2002) Past reference could even determine project approval based on beliefs or opinions. One project manager stated, "Some of the projects are approved on faith, reputation, and track record." If a project manager has been successful on past questionable projects, then upper management might be more willing to accept intangible values as justification for project approval.

A project with intangible values that needs approval should reference parallel projects. By having documented projects that have been successful proves intangible values are important. According to Kristensen and Westlund (2003) "Some companies now report externally on various aspects of intangible assets, but this happens in a very non-standardized way and seems to be of limited value for investors' decisions."

**Tie Intangibles to Corporate Strategy**

Trying to convince upper management to approve a project that has intangible values involves creative thinking. Tie the intangible to corporate strategies and intangible benefits may be seen as highly important.

Appendix B provides examples of how intangibles strategically impact a project and can be quantified. . While Appendix C provides examples of how initial intangibles can be connected to a tangible benefit and quantified.

**Evaluate Completed Projects**

Evaluating completed projects establishes documentation about a project that has intangible values. Kristensen and Westlund (2003) argue "Lack of reliable and relevant information on intangible assets implies there is no basis for non-financial reporting, which in turn implies that market values will change over time in a less well-founded way." Ten IT interviewees' reported, "We measure the benefits after a project is completed.

## 6. SUMMARY

The problem of identifying and quantify intangible benefits was emphasized not only in the literature but also in the interviews of IT professionals in southeast North Carolina.

Although IT professionals understood the need for the measurement of intangibles they found the task of developing the measurement techniques challenging. In addition convincing management of values for intangible items needs to be overcome.

The IT professionals agreed a valid starting point would be to begin measuring just a few intangibles and get management approval on the value of those items. In addition this needs to be followed up with a post project review again measuring the actual intangible value versus the project plan. Once this is accomplished the process may begin again with more intangibles considered on subsequent projects.

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**Appendix A**

**Sample Survey Questions**

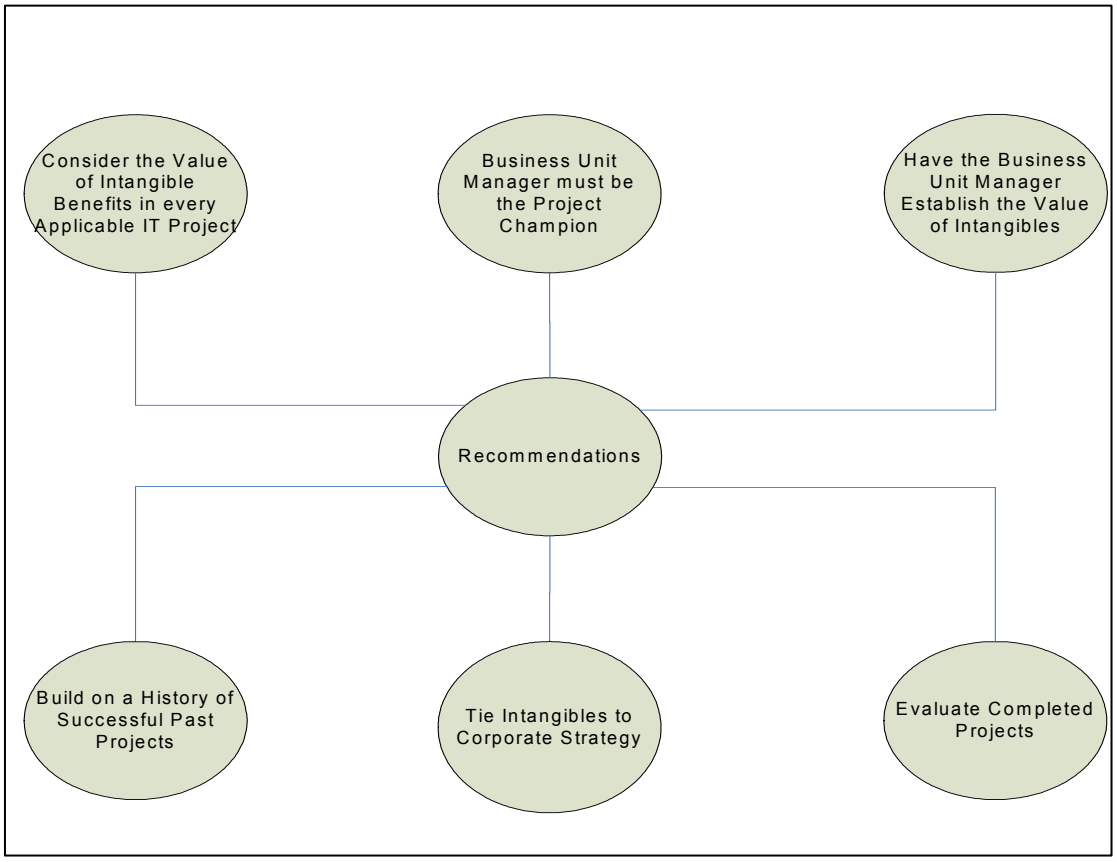
1. Please give a brief synopsis of your career to date?
2. Tell me something about what you enjoy about your job.
3. How long have you been at _____?
4. What are some your current projects that you are working on?
5. Were you involved in process for getting projects approved for funding and could you describe some examples?
6. Describe the levels of approval necessary to approve projects.
7. What financial metrics do you currently use to evaluate projects (i.e. ROI, Cash flow)?
8. How do you justify project benefits and revenue?

**Some projects are extremely difficult to measure, especially those with intangible benefits. The goal of this research is to build a set of guidelines that can be followed to better measure intangible values for IT projects.**

9. Currently, how does your organization measure these intangibles?
10. How does your organization evaluate intangibles for project approval?
11. Do employees at your organization find it challenging to evaluate intangible values?
12. What are some examples of some of your intangibles.
13. What methods have you used in the past to prove these intangible values?
14. What would you do differently?
15. Are you required to go back and measure after the project is done?
16. Have you ever had a project approved that only had intangible values?
17. Do you go back and measure after the project is done?
18. Do you know about any IT projects that have been questionable in the beginning because of intangible value, but later really improved an organization?
19. If there was a set of guidelines suggested for measuring intangible values would your organization use them?

**Appendix B**

**Recommendations from Industry and on Project Justification**



**Appendix C**

**Examples of the Strategic Impact of Intangibles**

| Strategic Impacts | Measurement | Quantifiable Impact |
|---|---|---|
| EXTENT OF IT INTEGRATION – ALL CORPORATION DIVISIONS<br><br>DECISION MAKING | *Increase level of communications between departments, especially meeting times.*<br><br>*Change in meeting anticipated ROI.* | Cost per manager per meeting hour.<br><br>Better decision support system provides historical data and outside database.<br><br>Measure actual ROI vs. projected.<br><br>System provides 2% reduction in the gap, providing management a better means to evaluate projects. |
| INSTALLATION OF AUTOMATIC TRACKING – KEY COMPETITOR PRICES | Respond to changes in competitor's price changes quicker. | Every minute of price difference between prices and a competitor costs. |
| INSTALL ERP SYSTEM | *Reduce steps in all phases of the operation.* | Select departments or processes and measure time difference before and after. |

**(Bysinger, Knight, 1996; IT community interviews)**

**Examples of Quantifying Intangibles**

| Operation IT Impacts | Measurement | Quantifiable Impact |
|---|---|---|
| SALES PER EMPLOYEE | *Change in # of 'closes' per day, per salesperson.* | New system increased... closes from 13 to 15.<br><br>Average sale is $100 = $200/per salesperson per day increase. |
| WAIT TIMES CUSTOMER SERVICED | *Before and after wait times per average customer.* | System time reduced 5 to 3 minutes…<br>20% less dropped calls.<br><br>Increased sales as each completed call results in $50 revenue. Pay for the 800 number. |
| SATISFIED CUSTOMERS | *Change in # of customer complaints per 1000 orders.* | Each complaint takes 12 minutes of customer service at $15/hour… measure reduction.<br><br>Satisfied customer rates |

| | | |
|---|---|---|
| | | less than 75% will not repurchase. Increase 5% customer service satisfaction. |
| PROBLEMS RESOLVED | *Measure # of customer complaints resolved before/after.*<br><br>*Help Desk Tickets.* | Increase problem resolution by 25%, happy customers…<br>reorder $100/year.<br>Historically customers whose problems are not solved are lost. If 10 customer problems are resolved per year.<br>$5000/month for help desk employee…<br>add 2 help desk tickets per hour. |
| ORDERS PROCESSED | *Increase in orders/out the door per day.*<br><br>*Orders processed within 24 hours.* | Measure impact on cash flow by more orders per day…<br>resulting in quicker receivables.<br>20% not processed within 24 hours are cancelled…<br>reduce cancellations. |
| RETURNING CUSTOMERS | *Measure repeat purchases per year by customer.* | System maintains better customer corresponding…<br>3% annual increase.<br>Repeat customer spends 33% more on average then a 1st time customer. |
| RETURNING CUSTOMERS | *Retention Ratio.* | Renewals represent 50% decrease in processing…<br>customer data in computer file. |
| WEBSITE CONVERSIONS | *Change in customer information requested.* | 10% of requests turn into a customer…<br>each customer yields $1200 per year. |
| HITS WEBSITE<br>E-MAIL<br>NEWSLETTERS | *Increase in email addresses submitted to received newsletter.* | 1000 hits = 100 emails that result in 5 sales…<br>$100 per person. |
| HIGH QUALITY PIECES PRODUCED | *Change in # of defects per million.* | Productivity increase 96% to 97%, % is worth 10,000 per 1 million…<br>defective product with a warranty costs $100.00, decrease from 10 to 5%. |

**(Bysinger, Knight, 1996; IT community)**