A Study of the Costs & Benefits Associated with ISO 9000 In Selected Wisconsin Companies

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Results are presented of a study that ascertained the costs and benefits associated with ISO 9000 for selected Wisconsin companies as of March 1998. The companies that participated in this study were selected from an updated 1998 Quality Digest Internet Database. The population was limited to those companies that were ISO 9000 certified (a total of 473). A questionnaire was developed and sent to 118 randomly selected companies from the designated population.

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Statement of the Problem

Companies have traditionally inspected their products in order to sort out the conforming from the non-conforming. These efforts were at best a meager attempt at quality assurance. As time and industries evolved, however, so did methodologies. During World War II, when mass production became a requisite, statistical techniques and quality management systems came to the forefront.

One such system is ISO 9000. It is a quality management system that started in Europe and is today accepted throughout the world as a standard. In today's quality-conscious environment, companies now often require their suppliers to become ISO 9000 certified. ISO 9000 consists of a set of five quality assurance system standards that 100 countries have adopted nationally. Key elements to ISO certification are training and procedural documentation. Some of the key benefits of ISO 9000 are increased quality, decreased costs, decreased lead times, fewer customer audits and improved customer perceptions. ISO 9000 is not a product registration standard. It in no way qualifies a company's product or service, nor does it mean that two companies with ISO 9000 registration are equivalent.

ISO 9000 requires:

- Management that is committed, involved, focused and responsive.
- People who are organized, responsible, authorized, competent, empowered and knowledgeable.
- Processes that are visible, traceable, consistent, repeatable, measurable and documentable.
- Documents that are appropriate, relevant, simple, understandable and consistent with processes in use.¹

In order to create a quality management system that complies with the ISO 9000 criteria, companies need to assess cost and benefit data to decide whether certification is economically feasible. A cost benefit analysis is based on estimates and assumptions that are uncertain. As a result of this, it is not always possible to identify and quantify all benefits and costs. While a cost benefit analysis provides valuable information, it does not automate the decision-making process. A cost benefit analysis is a tool for identifying the option that maximizes benefits. At the heart of this technique is the identification of options and the quantification, in monetary terms, of the value that all parties would place on the choice of an option relative to another option.²

Example: A company with \$350,000 left in the annual budget is contemplating which of the following options to choose:

- New Plant Machinery
- Upgraded Personal Computer Network
- Implementation/Certification to ISO 9002

Each of these options has relevant costs and benefits. By quantifying the respective costs and benefits of each option, companies will be able to choose the option that maximizes benefits.³

All service and manufacturing companies, will have the opportunity to pursue future ISO 9000 certification. The purpose of this study was to provide companies with ISO 9000 cost and benefit data. Individual companies will be able to evaluate the results from this study to determine whether the ISO certification option is a viable one.

Purpose of the Study

1. To determine the costs associated with ISO 9000 certification for Wisconsin companies.

2. To determine the benefits associated with ISO 0000 certification for Wisconsin companies.

It was also the goal of the author to make the results of this study known to anyone looking for information of this nature at the University of Wisconsin-Platteville.

Significance of Study

Wisconsin manufacturers are participating in a global economy. In order to ensure acceptance in international markets, ISO 9000 certification is often a requirement.

Currently, companies in Wisconsin are experiencing many changes in the business arena. These changes include:

- 1. Increased compliance costs
- 2. Decreased margins

- 3. Increased competition
- 4. New market opportunities

It is a generally accepted practice for Wisconsin companies to do a cost/benefit analysis to determine the feasibility of a project. This study will help Wisconsin companies estimate the viability of ISO 9000 certification.

Assumptions

It was assumed that most Wisconsin companies need cost/benefit information with regards to ISO 9000 certification. It was also assumed that companies in Wisconsin that are ISO 9000 certified would provide the information requested in the questionnaire.

Delimitations of the Study

This study was limited to all companies located in the State of Wisconsin that were ISO 9000 certified. The companies used for this study were selected from the updated Quality Digest Internet Database.

Methods of Approach

A general review of the literature related to the selection of appropriate materials for ISO 9000 certification was conducted. The instrument used to gather data for this study was a questionnaire. The questionnaire was comprised of questions that pertained to cost and benefits associated with ISO 9000 certification. The questionnaire was mailed to the selected manufacturers on February 27, 1998. A deadline of March 15, 1998 was set for the return of the questionnaire. Two days following the deadline for response, a second questionnaire and a follow-up cover letter was sent to each manufacturer that did not initially respond. A final response deadline of March 30, 1998 was stated in the mailing. One week following this final deadline, the data was tabulated and analyzed.

REVIEW OF RELATED LITERATURE

The search for related literature was made by reviewing the <u>CD/ROM INDEX</u>, <u>INFO TRAC INDEX</u> and the <u>FIRST SEARCH INDEX</u> located in the Karrman Library at the University of Wisconsin-Platteville. Additional information was obtained from the World Wide Web and journal articles.

The ISO 9000 series (ISO 9000, ISO 9001, ISO 9002, ISO 9003 and ISO 9004) is a set of interna-

tional standards for quality management systems. Its purpose is to give companies assurance that products and services have been manufactured under consistent and effective quality systems.

"Put another way, rather than relying on the testing of finished products to determine if they meet design or performance requirements, ISO's philosophy is to certify the manufacturer's procedures to assure customers that all products will meet the requirements for quality."⁴

The European Union countries still lead the world in ISO 9000 certification in both the production and service industries, while United Kingdom and German industries have high growth rates. Current data per Mobil Survey No. 5 figures (ending 1995), found the following certification breakdowns⁵:

	Percentage of
Location	Certifications
United Kingdom	41.3%
(Rest of Europe)	31.4%
United States	
Australia/New Zealand	8.3%
Far East	7.2%

The costs of implementing ISO 9000 are both internal and external. The actual costs (or investments) are a function of a number of factors that include the current state of the quality program, company **size**, the degree to which teams are used versus contracted consulting services, project duration etc. The certification process can take as little as a few months to well over a year.

A variety of data was found concerning costs that companies incur throughout the ISO 9000 implementation and certification process. One comprehensive study found that cost for 50-1500 employees ranged as follows:

External Costs: Consulting Fees: \$25,000-\$100,000 Initial Registration Fees: \$5,000-\$25,000 Internal Costs: 2 to 10 person years⁶

The ISO 9000 expenditures include implementation and certification costs. One study concluded that the average implementation cost for responding companies was about \$75,000. Typically, smaller companies have smaller certification costs. The perception "That it's going to cost you at least \$50,000 to become registered and another \$25,000 a year to keep it" is not true. The reality is that external costs associated with the process are directly proportional to the company's size (number of employees).⁷

Company size also has the largest impact on the time required to obtain certification of a quality system, and registration of that system may take anywhere from 6 to 18 months. Key factors include variables such as available resources, management commitment and employee buy-in.⁸

Other views exist with regards to the ISO 9000 costs for small to mid-size firms. The initial registration fee is \$10,000. The addition of other fees can bring the base price up to at least \$35,000. This cost reflects basic certification and six-month check-up fees over a three-year period. Then the cycle will continue to repeat.

These figures do not include "hidden" costs such as employee time and money spent on internal improvements required to meet ISO 9000 certification. These small businesses often encounter "external consultant syndrome." While large organizations rely upon their own personnel to implement quality initiatives, small companies depend on consulting services to achieve this outcome. Employee time and the cost of bringing in outside consultants contribute the most to ISO 9000 costs. For example, many so-called ISO 9000 consultants charge upwards of \$1,800 a day.

For all of these reasons, small to mid-size companies can expect to spend considerably more than the basic registration cost of \$35,000. Many companies may have to invest as much as \$250,000 to earn ISO 9000 certification the first time, and major corporations report the cost to be about \$1 million.⁹

While there are several costs associated with obtaining ISO 9000 certification, there are many benefits as well. According to the Survey of Quality Consultancy Scheme Client, researchers contacted and surveyed more than 2,300 firms and found that the following benefits of ISO 9000 were realized:

- 89% reported a greater operational efficiency.
- 48% reported increased profitability.
- 76% reported improvement in marketing.
- 26% reported an increase in export sales.¹⁰

Many companies reported that ISO 9000 implementation and certification was a very positive experience. The benefits have come primarily from the planning, preparation and internal audit programs. The activities designed to resolve the identified non-conformances were critical to the problem-solving activities. The external audits helped confirm activities and findings.

Other companies have found these fundamental benefits:

- Development and expansion of business, particularly in areas where registration is a prerequisite.
- Reduction or elimination of customer audits.
- Increased profitability/reduced costs.
- Improved communications, both internal and external.
- Greater awareness of quality by employees, accompanied by enhanced pride in their jobs and contribution to the company's quality system.
- Provision of training to all personnel.
- Ability to remain/become competitive in the markets.
- Realization that meeting the requirements is not rocket science but common sense.
- Elimination of redundancy.
- Electronic document management system

In addition to these benefits, companies have found that certification enhances their opportunities with large customers. Certified businesses are also finding that employees are more content with their jobs due to better training, which resulted in greater pride in their work. These companies have also begun to shift from corrective actions to a process improvement model that allows them to solve problems before they arise, thus eliminating the frequency of corrective actions.

A recent McGraw-Hill/Dun & Bradstreet concluded that a potential for payback exists. This study found that 50% of the companies registered since 1987 have been able to recover their ISO 9000 implementation costs in three years or less. Data from the same McGraw-Hill/Dun & Bradstreet study show that nearly 85 percent of companies are at least "encouraging" their subcontractors to become registered.¹²

In the United States IBM and Motorola are two of the many companies that are starting to require ISO 9000 compliance. It is believed that regulated industries and government agencies may not be far behind. Throughout the world, companies are demanding ISO 9000 certification from their suppliers.

ISO 9000 can, in almost every case, eliminate customer audits. ISO 9000 certification is a uniform standard, accepted and recognized internationally. ISO certification means that your organization can allocate time and resources toward improving the real quality of your processes and products, instead of focusing on measuring up to individual supplier standards.

One company has reported a benefit from the ISO 9000 training requirements. This particular company "felt that people doing the work (primarily the plant personnel in this case), must have ownership of the process". Without their support, the program would not have been successful. Each procedure needs to be a living and breathing document that changes as individual work processes improve. The training requirements helped ensure that changes are instantly communicated to the employees right at the process, which consequently enhanced overall performance.¹³

The significance of ISO 9000 became more widely recognized. "State and local funding for ISO 9000 training is available in many states, particularly those that recognize the importance of ISO 9000 in boosting the economy by allowing small businesses to expand into other lucrative markets.¹⁴ The federal government, through the Small Business Administration, offers low-cost business loans to companies for a variety of uses, ranging from training to large equipment purchases. These loans could be used to supplement a small company's ISO 9000 initiative from training and implementation through to registration.¹⁵

There are many other ways that money can be saved in the implementation of the ISO 9000 standards. The following are seven profit makers that are built into the ISO 9000 standards that were never intended. These seven money making areas, in order of prerequisite, are:

- Positive Management
- Management style changes at all levels
- Process Improvement
- Using the creative power of the work force
- · Direct management link to improvement efforts
- Maintaining machines and people
- Documentation shortcuts¹⁶

The implementation and maintenance of an ISO 9000 program can be costly. Many factors are inclusive in the certification costs, including the size of the company, and the status of the quality program prior to ISO 9000 implementation. The benefits of an ISO 9000 program are numerous ranging from the reduction of manufacturing costs, to the participation in new markets.

Wisconsin companies need cost/benefit data to decide whether implementation and certification of an ISO 9000 quality assurance program is cost effective for their respective company. Wisconsin companies need to be prepared for the future requirement of ISO 9000 certification in their respective industries.

PRESENTATION OF THE DATA

In the process of ascertaining the costs and benefits associated with ISO 9000 for Wisconsin companies, the following delimitations were taken into consideration:

- 1. The study was limited to companies located in the State of Wisconsin.
- 2. The study was limited to companies listed **in** the Quality Digest Internet Database of ISO 9000 certified companies.
- 3. The respondents supplied data for the study in a conscientious manner.

In the process of selecting the companies, 469 met the criteria. From this population, 118 companies were selected randomly to construct the sample group. A questionnaire was prepared and mailed to each of the selected companies in the sample group.

The response to the questionnaire totalled 71 of the 118 solicited companies. This represents 60 percent of the selected group. The data contained in this section was obtained from the returned questionnaires.

It should be noted that for the purpose of this study, the sample size used for the calculation of the results will vary upon the questions. This is due to the fact that not every question was answered by each respondent.

Nine companies that were unable to provide benefit information, documented that ISO 9000 certification has paid off in their industries, because it is a requirement for participating in their respective markets. Sixty-eight companies responded to a question concerning whether their respective company was ISO 9000 certified. One-hundred percent of these companies responded that they were ISO 9000 certified.

Sixty-seven companies responded to a question concerning whether their respective company achieved full or partial certification. One-hundred percent of these companies responded that they were ISO 9000 certified.

Sixty-six companies responded to a question concerning which date their respective company achieved ISO 9000 certification. The average date of certification was July 6, 1995.

Sixty-eight companies responded to a question concerning which ISO certification was obtained. Thirtyfour companies received ISO 9001 certification, while 33 companies received ISO 9002 compliance. One company achieved both ISO 9001 and ISO 9002 certification.

Sixty five companies responded to a question concerning the number of employees in the certified business unit. The average certified business unit was composed of 589 employees.

Sixty-eight companies responded to a question concerning whether another quality certification was obtained prior to ISO 9000 certification. Twenty-four percent, or 18 companies responded that they had achieved other quality certification prior to ISO 9000 certification. Seventy-six percent, or 50 companies responded that they had not achieved other quality certification prior to ISO 9000 certification.

Of the 18 companies that had achieved previous certification, six companies achieved the Q I certification, seven companies achieved the QS9000 certification and five received another unique certification.

Sixty-six companies responded to a question concerning whether a cost benefit analysis on ISO 9000 certification was performed. Ninety-four percent, or 62 companies responded that they had not done a cost benefit analysis. Six percent, or four companies responded that they had done a cost benefit analysis.

Thirty-four companies responded to a question concerning the internal cost of initial certification. Fortyfour companies responded to a question concerning the external cost of initial certification. The average initial internal cost \$73,650. The average initial external cost \$43,130. The average internal cost of initial certification per average employee hour for the companies supplying initial certification cost data was \$118. The average external cost of initial certification per average employee hour for the companies supplying initial certification cost data was \$63.

Thirty-one companies responded to a question concerning the annual internal costs to maintain certification. The average annual internal cost to maintain ISO 9000 certification was \$17,343. The average internal cost of annual certification per average employee hour for the companies responding to the question was \$30.

Thirty-eight companies responded to a question concerning the annual external costs to maintain certification. The average annual external cost to maintain ISO 9000 certification was \$10,326. The average external cost of annual certification per average employee hour for the companies responding to the question was \$23.

Recommendations:

Additional studies could be conducted as comparison studies. Based on the fact that the average company has been certified less than three years, it is likely that the percentage of companies receiving a payback would increase. A similar study could contrast two or more states to determine which state has a higher percentage of paybacks from ISO 9000 certification.

References

- 1. Navin S. Dedhia, "The Basics of ISO 9000," *Quality Digest*, (October 1995), p. 52-54.
- "Highway Benefit-Cost Analysis: a Review of Evidence- Importance Benefit Cost Analysis." http://www.tc.gc.ca/tfacts/Report/sip revu/ chapt2.htm
- 3. *Ibid*
- 4. http://www.twoten.press.net/stories/954/10/26/ headli-nes/BUSINESS Small Quantity.html (1 Feb. 1998)
- "Worldwide Cost Trends-ISO 9000 in Europe" httv:Hwww.industry.net/iso9OOO/costs4.htm (6 Feb. 1998).
- 6. "Costs of an ISO 9000 registration project." http://fox.nstn.ca/-notra/cost.html (4 Feb. 1998).

- 7. D. Vloeberghs and J. Bellens, "Implementing the ISO 9000 Standards in Belgium," *Quality Progress*, (June, 1996), p. 43-44.
- "ISO 9000 For Small Companies." 1997 http:// www.gualitydigest.com/aug97/html/cover.html (2 Feb. 1998).
- 9. "Worldwide Cost Trends-ISO 9000 in Europe" http:Hwww.industry.net/iso9OOO/costs4.htm (6 Feb. 1998).
- 10. Marissa Gomez and Javier Garzaer. "ISO 9000 -An International Standard" 1996.
- http://www.baclass.panam.edu/courses/intb4365/ Fall96/IS0900O.html (2 Feb. 1998)
- 11. Jack E. Small, "ISO-9000 AND IBN'S TOTAL QUALITY MANAGEMENT PROGRAM"
- http://www. semi.org/Focused/guality/ibm.html (2 Dec. 1997)
- "ISO 9000 For Small Companies". 1997 http:// www.qualitydigest.com/aug97/html/cover.html (2 Feb. 1998).
- 13. L.E. Whitsed and D.M. Thomas, "THE ROAD TO ISO 9002 REGISTRATION"
- http://www.semi.org/Focused/guality/air.html (6 Dec. 1997)
- 14. "ISO 9000 For Small Companies". 1997 http:// www.gualitydigest.com/aug97/html/cover.html (2 Feb. 1998)
- 15. *Ibid*.
- M.J. Scotto, "Seven Ways to Make Money From ISO 9000," *Quality Progress*, (June, 1996), p. 39-41.