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Quality Programs and Small Business Performance: Evidence from the US

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ABSTRACT

This study examined quality management and process improvement practices that distinguish award-winning small business firms, aiming to identify patterns linked to organizational excellence. Small enterprises typically face significant resource constraints, making evidence-based strategies essential for effectively allocating limited resources to high-impact improvement initiatives. Utilizing applications from recipients of the Malcolm Baldrige National Quality Award the only national quality award formally presented by the President of the United States this research leveraged *ATLAS.ti* qualitative data analysis software to systematically conduct text-mining and content analysis. The coding framework was informed by established scholarship on quality management and the Certified Six Sigma Black Belt Body of Knowledge (CSSBB). Through iterative coding and comparative analysis, the study identified recurring quality management practices and process improvement techniques associated with superior organizational performance. The findings enhance the literature on small firm excellence by empirically validating which quality practices are most frequently and effectively implemented in successful small business contexts, thus advancing theoretical understanding of quality-driven competitiveness in resource-constrained environments. Additionally, the study presents a practical benchmark for practitioners seeking to adopt proven quality management practices that bolster operational efficiency, customer satisfaction, and long-term sustainability.

Keywords: TQM, process improvement, quality management, Six Sigma, lean methods, small business

Introduction

Quality management systems (QMS) are structured frameworks that define processes, procedures, and individual responsibilities to achieve organizational quality objectives. These systems guide organizations in managing and monitoring activities that foster a culture of continuous improvement. Empirical studies have shown that implementing a quality system enables businesses to realize benefits such as waste reduction, cost savings, enhanced employee engagement and empowerment, improved communication, increased customer satisfaction, and more effective supplier management. Core QMS principles include leadership, customer focus, employee involvement, a process-oriented approach, continuous improvement, data-driven decision-making, and relationship management (Curkovic et al., 2000; Mateos-Ronco & Mezquida, 2018; Prajogo & Sohal, 2004; Pambreni et al., 2019; Sahoo, 2019).

Quality programs are designed to assist organizations in meeting customers' needs, requirements, and expectations (Summers, 2009). An organization's performance is often assessed from the customer's perspective, which includes how effectively the business delivers customer value a key factor in sustaining operations. Among customers' priorities, quality is a key measure of a company's product defect rate, on-time delivery, and the accuracy of delivery forecasts (Kaplan & Norton, 1992).

Quality goes beyond merely describing a product or service; it involves meeting a set of requirements typically tied to customers' needs and desires. Essentially, quality is about satisfying customers, improving response times, reducing cycle times and waste, and eliminating defects and rework using tools such as Pareto charts and root cause analysis. Successful organizations embed quality into their culture, which supports the implementation and sustainability of quality programs. As a result, quality performance contributes directly to overall business performance. Hence, significant research has been conducted into how quality programs influence performance, with studies examining this from various angles and in different contexts. For instance, a meta-analysis by Ahmad et al. (2015) reviewed the effects of Total Quality Management (TQM) on business performance across companies in Asia, Europe, and America. The study revealed that developed countries experienced more benefits from TQM practices than developing ones. However, variance analysis indicated no significant difference between countries or regions, suggesting that geographical location doesn't significantly impact how TQM affects performance. The study also found a weak but noteworthy relationship between TQM and performance, signaling the potential value of implementation.

Other research has focused on the impact of quality programs in specific industries, such as the automotive supply sector (Curkovic et al., 2000), higher education quality (Mateos-Ronco & Mezquida, 2018), manufacturing (Prajogo & Brown, 2004), pharmaceuticals (Sharma & Modgil, 2019), the nature and size of the enterprise (Pambreni et al., 2019; Sahoo, 2019), and the construction industry (Jimoh et al., 2018). Overall, the body of research on quality management provides valuable insights into how quality programs positively affect business performance. Identifying which specific practices have the most significant impact on performance can further enhance existing literature and offer additional benefits for practitioners. These high-impact practices enable organizations to gain greater returns on their investments.

The research on the performance impacts of quality programs has typically concentrated on the effects of entire

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programs, such as TQM or Six Sigma, on business and quality performance, without paying much attention to the influence of individual practices. This study, however, highlights the impact of specific quality program practices on business and quality performance. Managers in resource-constrained companies can benefit from identifying which practices yield the greatest impact, allowing them to focus their efforts and better allocate limited resources toward the most critical areas. By addressing this gap, this study contributes to expanding the literature on the role and impact of quality programs on business performance.

Business companies in general, and small and medium enterprises (SME) in particular, can maximize the benefits of quality programs by focusing on specific practices that have the greatest impact on quality performance, addressing both resource allocation and return on investment concerns, and avoiding the adoption of less impactful or even unnecessary practices. The existing literature offers valuable insights into the role of quality programs in mediating business performance (Jimoh et al., 2018), the factors that determine quality performance (Durairatnam et al., 2020), and the effects of quality programs on both quality and business performance (Curkovic et al., 2000). However, these studies, along with others, have not directly identified which quality practices have the most significant impact on quality performance. This study seeks to fill that gap.

Theoretical background

The research on the impact of quality programs, particularly Total Quality Management (TQM), has provided valuable insights into how these practices influence both quality and business performance across various industries. In a study by Pambreni et al. (2019), the implementation of TQM was shown to have a positive impact on business performance, particularly in small and medium-sized enterprises (SMEs). The study focused on specific TQM elements such as customer focus, continuous improvement, strategic alignment, and employee involvement. Customer focus involves understanding and exceeding customer needs, while continuous improvement emphasizes identifying opportunities to reduce waste, improve efficiency, and eliminate defects. Strategic alignment integrates quality initiatives into the organization's overall business strategy, and employee involvement empowers employees through training and participation in improvement efforts. The results of Pambreni et al. (2019) demonstrated that these practices collectively had a significant impact on business performance, confirming the positive effects of TQM on both quality and overall business success.

Similarly, Sharma and Modgil (2019) examined the impact of TQM practices in the pharmaceutical industry in India. Their study identified key TQM practices such as top management support, customer focus, research and development, product quality, and total production maintenance. They found a positive relationship between TQM practices and operational performance, highlighting the importance of upper management support as a key driver of performance. Their study also showed that the synergy between TQM practices and supply chain management (SCM) practices had a substantial effect on operational performance, suggesting that TQM combined with SCM practices improves performance.

Curkovic et al. (2000) explored the impact of various TQM and Six Sigma practices on both business and quality performance. They found that practices like committed leadership, employee empowerment, cross-functional teams, quality training, and statistical process control positively influenced business performance. Their study revealed that quality programs not only impacted quality performance directly but also indirectly through improvements in relationship quality and product quality. By examining these practices individually, the authors showed that each TQM action had a distinct and measurable effect on business performance.

In the construction industry, Jimoh et al. (2018) investigated the role of TQM practices in organizational performance, finding that customer focus and top management involvement were particularly influential. Their study also tested the mediating effect of continuous improvement strategies, showing that these strategies played a significant role in linking TQM practices with enhanced performance. These findings support the idea that top management commitment and employee-focused strategies, such as continuous improvement, are key to maximizing the benefits of TQM practices.

Durairatnam et al. (2020) focused on people-related TQM practices in the apparel industry, identifying factors such as top management commitment, employee empowerment, involvement, training, and teamwork as key drivers of quality performance. Their research showed that a positive organizational culture, employee work attitudes, and perceptions of organizational justice were crucial for the success of TQM programs. They found that top management commitment was the most influential factor, followed by empowerment and teamwork, further emphasizing the importance of leadership and employee engagement in achieving quality improvements.

Sahoo (2019) explored the standalone and combined effects of Total Productive Maintenance (TPM) and TQM on business performance. His study found that an integrated approach using both TPM and TQM practices yielded the most significant improvements in business performance. TPM practices focused on increasing productivity, reducing costs, and improving equipment reliability, while TQM practices enhanced quality, customer satisfaction, and operational efficiencies. The research demonstrated that the integration of both practices provided a more substantial impact on business performance compared to using either practice alone.

These studies collectively emphasize the importance of adopting specific TQM practices and, in some cases, integrating them with other practices such as TPM or SCM. By identifying and focusing on the most impactful practices, businesses can better allocate resources and improve both quality and overall performance.

Mateos-Ronco and Mezquida (2018) examined the influence of Total Quality Management (TQM) practices on

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educational quality by utilizing the European Foundation for Quality Management(EFQM)excellence model. Their qualitative study, using the Delphi method, identified performance and strategy monitoring measures. A balanced scorecard was developed to enhance performance in public vocational training centers (PVTCs) in Spain. These centers play a significant role in the Spanish educational system, equipping youth with valuable skills to meet labor market demands. PVTCs operate autonomously with unique organizational policies, adapting to socio-economic changes while tracking job placements and graduate satisfaction to evaluate training quality.

The researchers tailored the balanced scorecard for public institutions, employing a top-down approach that incorporated customer perspectives, internal processes, learning and growth, and financial considerations. A two-phase process involved experts refining data through questionnaires, highlighting the EFQM model's effectiveness in applying TQM within educational settings. The study confirmed the EFQM's reliability for improving educational quality (Mateos-Ronco & Mezquida, 2018).

Prajogo and Sohal (2004) analyzed a manufacturing firm's TQM implementation, illustrating its progression from basic quality control to advanced customer-focused innovation. The study emphasized that sustained efforts and strategic alignment with other quality initiatives are crucial for successful TQM outcomes. They also highlighted the pivotal role of upper management in TQM success, underscoring the importance of leadership, resource allocation, and ongoing commitment. Employee involvement emerged as a key factor in fostering trust and engagement, enhancing TQM's impact across organizational functions, and supporting the premise that quality management lays the groundwork for innovation (Prajogo & Sohal, 2004).

Pimentel and Major (2014) explored TQM's role in organizational change within a government agency, integrating TQM with the balanced scorecard over a decade-long study. Through interviews and document analysis, they found that TQM principles, combined with performance management systems, facilitated organizational improvement. The balanced scorecard made strategic objectives visible, aiding in cultural and operational transformations. The study demonstrated TQM's capacity to foster organizational change and its effective application in public sector contexts (Pimentel & Major, 2014).

Projogo and Brown (2004) investigated the correlation between TQM practices and quality performance, comparing companies with and without formal quality programs. Findings revealed that adopting TQM practices, irrespective of formal program status, significantly enhanced quality performance. The study showed that TQM firms outperformed non-TQM firms, reinforcing the value of TQM in improving organizational outcomes (Projogo & Brown, 2004).

Ruiz et al. (2019) analyzed the impact of high-performance work systems (HPWS) and TQM on business performance. The study concluded that while HPWS positively influenced performance, TQM directly improved business outcomes and mediated the relationship between HPWS and performance. The research highlighted the synergy between human resources management and TQM, advocating for alignment in strategies like empowerment, recognition, teamwork, and communication to optimize results (Ruiz et al., 2019).

Lakhal (2014) proposed a conceptual model connecting ISO 9000 certification, TQM practices, and organizational performance. Empirical testing across various industries revealed that ISO 9000 certification positively impacts TQM practices and organizational performance, serving as an initial step toward comprehensive TQM adoption. The findings suggested that ISO 9000 could act as a foundational framework for TQM implementation, enhancing overall business performance. Particularly, the study provided empirical evidence linking ISO 9000 certification and TQM practices, leading to the recommendation that organizations adopt ISO 9000 standards first to facilitate the successful implementation of TQM and maximize benefits (Lakhal, 2014).

TQM offers a management framework consisting of principles, methodologies, and tools designed with customer satisfaction as the primary focus (Klefsjö et al.,2001). Its overarching goal is to enhance organizational outcomes (Mehrjerdi,2011). One of the methodologies frequently associated with TQM is Six Sigma, which has drawn significant attention from practitioners, scholars, and industries (Klefsjö et al., 2001). Six Sigma emphasizes business process and capability enhancement, providing a more structured and comprehensive approach than other quality and continuous improvement methodologies (Mehrjerdi, 2011). It serves as a systematic method for improving products and processes (Klefsjö et al., 2001).

A structured literature review conducted by Reosekar and Pohekar (2013) revealed that Six Sigma has garnered widespread interest across academia, industries, and research communities worldwide. The findings highlight the methodology's relevance in process enhancement and business performance improvement. Similarly, Patel and Patel (2021) performed a critical review of Lean Six Sigma and found it to be a leading quality improvement approach. The authors noted that integrating Six Sigma with Lean techniques significantly reduced waste and process variability. Their study also showed a growing body of research on this methodology, confirming its increasing adoption across various economic sectors.

Kumar et al. (2011) examined the application of Six Sigma in a foundry setting to improve processes by minimizing casting defects. The study optimized process parameters using the DMAIC-based Six Sigma approach, while the Taguchi experimental design method was employed to identify optimal process settings. Their findings suggested that Six Sigma could enhance both the efficiency and performance of the casting process while maintaining cost-effectiveness.

Another case study by Daniyan et al. (2022) demonstrated the application of Lean Six Sigma (LSS) to enhance the railcar bogie assembly process. Their study showed that LSS improved manufacturing efficiency by reducing lead time and increasing process cycle efficiency. The implementation included lean tools such as Kaizen, Value Stream Mapping,

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Pareto charts, Single-Minute Exchange of Die (SMED), and 5S. The researchers concluded that process improvement with LSS is an ongoing endeavor. Their results showed a 46.8% improvement in process cycle efficiency (PCE) following the use of Kaizen, a 27.9% reduction in lead time, a 59.3% increase in value-added time, and a 71.9% decrease in non-value-added time after adopting the LSS approach.

Numerous other studies have confirmed the versatility of Six Sigma and Lean Six Sigma across different industries. For example, Kurnia et al. (2021) used the DMAIC Six Sigma approach to assess defect levels in a garment manufacturing process for sock production. Similarly, Adeodu et al. (2021) investigated the use of LSS to enhance productivity and minimize manufacturing waste in a paper production line, successfully addressing real-time challenges related to efficiency and waste reduction.

Overall, the literature suggests that TQM and process improvement methodologies do not follow a universal model but rather depend on a combination of techniques tailored to specific industries and processes. Integrating TQM with complementary improvement strategies, such as Six Sigma or Lean Six Sigma, can lead to significant organizational benefits (Durairatnam et al., 2020; Ruiz et al., 2019; Sahoo, 2019; Sharma & Modgil, 2019; Lakhal, 2014; Prajogo & Brown, 2004; Prajogo & Sohal, 2004). Research on TQM and Lean Six Sigma highlights the importance of identifying appropriate methodologies and their synergistic impact on organizational performance.

Methodology

Research design

The objective of this study was to identify the quality management practices implemented by Baldridge-award-winning companies. Applicants for the award must submit detailed applications about their processes, thereby providing evaluators with insight into practices used to achieve performance excellence. Applications are page-limited (Baldrige Performance Excellence Program, 2024); thus, applicants must be mindful of the choice of words to describe their process improvement efforts. The emphasis on word counts to accurately describe process management and improvements provides a context for text mining.

Text mining or text analytics is a research approach used to discover relevant information by extracting information from unstructured text documents (Lau et al., 2005). The frequency with which a concept or topic is referred to in a document indicates the level of emphasis and focus on the topic (Welborn & Bullington, 2013). This research consisted of examining the applications of the award-winning companies to discover the quality management practices most employed and implemented. Word frequency determined which practice or concept was cited more frequently. The search was conducted using Atlas.ti, a computer-assisted qualitative data analysis software.

Malcom Baldrige National Quality Award

Since its inception in 1987, the Award has played a significant role in helping business organizations improve their performance. It is the only quality award presented by the President of the USA. The award administration classifies applicants into seven categories: government, manufacturing, service, small business, education, healthcare, and non-profit. This study focused on the small business category. Small businesses are important economic engines in the US economy. They drive economic growth and contribute substantially to employment.

Business organizations applying for the award are required to submit detailed applications describing the management of their processes and operations. The award's evaluators examine the applications and determine the winners. The applications are considered case studies (Welborn & Bullington, 2013). All applications follow the same format structure, starting with a preface section that presents the organizational profile describing the organization's operating environment and its different business relationships. The preface is then followed by seven other sections, namely: leadership; strategic planning; customer focus; measurement, analysis, and knowledge management; workforce focus; process management; and results. Each section describes how organizations develop, manage, and improve their business processes (Baldrige Performance Excellence Program, 2024).

In addition, applicants are required to benchmark their results against their direct competition. Winners must provide meaningful results demonstrating successful performance metrics as compared to their competitors. The evaluation of the processes of these winners provides insight into the process improvement techniques that drove their success. The Baldrige application is, in this sense, a context for applicants (winners) to elaborate on their superior performance, thereby emphasizing what is important about their processes. The examination of the winners' applications allowed for the determination of any process improvement techniques that are common to all winners (Welborn & Bullington, 2013).

The winners' applications were examined using Atlas.ti, a computer-assisted qualitative data analysis software. The applications' content was entirely uploaded to the software as submitted to the evaluators, along with a document containing the concepts and practices related to quality management, identified from the literature review and Certified Six Sigma Black Belt Body of Knowledge. Data were collected as extracted practices from the winning applications with an emphasis on practices that were frequently cited. Applications were searched digitally as they are available in electronic format.

Procedure

The ASQ's (2022) Certified Six Sigma Black Belt Body of Knowledge (CSSBK) was used as an authoritative list of Six Sigma and lean terminology with additional quality management-related concepts and practices identified from the literature review. The CSSBK includes aspects of process improvement practices and approaches. It covers a wide array of topics on the

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following subjects: 1) organization-wide planning and deployment; 2) organizational process management and measures; 3) team management; and 4) the complete and detailed DMAIC process. ASQ's CSSBK was examined for a list of tools and techniques fundamental to process improvement. One hundred and thirty-five (135) terms and concepts related to process improvement were identified (i.e., SWOT, Benchmarking, ROI, VOC, FMEA, cause and effect, Fishbone diagrams, SIPOC, Process mapping, etc.).

Six Sigma methodology derives its importance, as a premier performance improvement model, from the adoption of its education and certification by the American Society for Quality (ASQ), and its promotion by Jack Welch of General Electric. It is recognized as a methodology that can be applied to any business process (Welborn & Bullington, 2013).

The tools and techniques identified are used by Six Sigma professionals and other practitioners to improve processes and have applications in virtually every functional process of an organization. This study examined the award applications of the winning companies to benchmark their use of process improvement techniques.

Twenty-one applications were evaluated and text-mined for frequently cited process improvement techniques. There was a total of 30 winners' applications available from the small business category since the inception of the award; however, the first nine did not meet the evaluation criteria as they were submitted under an earlier brief structure. These nine applications consisted of an average of one-page summary. The remaining 21 applications that were analyzed were submitted according to a new format with an average of a 70-page summary covering a preface and the seven sections mentioned earlier.

The applications were uploaded into Atlas. it along with a document listing the identified 135 terms and concepts related to process improvement (i.e., practices). A query was made to search each application for each term listed on the uploaded list of terms. The findings were then manually reviewed to omit any reference not relevant to a process improvement technique. That is, matching terms and/or acronyms used in a non-process improvement context were omitted. In addition, other generic terminology, such as goal, objective, process, and capacity, was removed from the analysis.

Each time a process improvement technique was referenced by an application because of the matching query, the usage count for that technique was indexed by one. The results were summarized in a table reporting the number of times a process improvement technique was cited in each application. The results showed what process improvement techniques are mostly used by the winning organizations, and the reference frequency of those techniques indicates their importance in an organization's business operating process.

The analysis is qualitative, and the inferences are limited to the small number of applications analyzed. The Baldrige Award process does not publish any information on all companies that apply for the award; only the applications of the winners are available to the public. A plausible statistical inference is, therefore, not possible with a data set of this size in this study of 21 cases, but learning and benchmarking are possible (Flyvbjerg, 2006).

Results

Table 1 reports the results of the search for process improvement techniques. The table includes only techniques used by at least 50% of the organizations in the sample (Welborn et al., 2013). An exception was made, however, for the ISO audit technique, which was used by only nine organizations out of 21 in the sample (less than 50%) but ranked sixth out of 14 mentioned techniques in terms of total references. The ISO audit technique was referenced 207 times, which accounts for 7% of the total references for all techniques included.

Four process improvement techniques were used by all organizations in the sample: surveys, benchmarking, cycle time analysis, and the use of measurement systems. These techniques were mentioned with a total of 368, 336, 325, and 281 references, respectively.

Strategic planning was mentioned the most by the award winners with 768 references. Although it was used by only 13 organizations from the 21 winners, its references accounted for 24% of the total references among the 14 techniques. The importance of this technique is further emphasized, knowing that the second most referenced technique surveys made only 12% of the total references. Business process planning and strategic process planning are two other terms used in lieu of strategic planning by different organizations.

Voice of the customer (VOC), SWOT analysis, and the scorecard as a key performance indicator are management techniques used by business organizations to improve their processes. VOC was referenced 204 times, a 6% share, by 11 organizations. Don Chalmers Ford, Mesa Products (2020 application), and Midway USA (2009 application) account for more than 65% of those references. SWOT analysis was mentioned 170 times by 17 organizations (5% share), and the use of the balanced scorecard was referenced 133 times by 14 organizations (4% share).

Data collection, such as statistical process control, root cause analysis, gap analysis, the use of interviews, and waste management, are additional techniques mentioned by at least 15 organizations from the sample. Data collection and root cause analysis references represented 3% of the total references, whereas gap analysis, interviews, and waste management references represented 2%.

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Table 1: Number of references to process improvement techniques by organization

Process Improvement Technique	Organization																						
	Pro-Tec Coating	Freese & Nicholas	K&N Management	Studer Group	Mesa Products (2012)	Don Chalmers Ford	Momentum Group	Bristol Tennessee	Stellar Solutions	Integrated Project Mgt	Mesa Products (2020)	Branch-Smith Printing	Los Alamos N. Bank	Mesa Products (2006)	Midway USA (2009)	Midway USA (2015)	Pal's Sudden Service	Park Place Lexus	Sunny Fresh Foods	Stoner Inc.	Texas Nameplate Co.	Total References	%	Count of Companies
Strategic Planning			44	33	43	52	53	117	71	76	60	17			92	86		24				768	24	13
Surveys	23	37	22	17	13	20	21	22	22	9	3	6	35	45	18	11	8	23	3	12	1	368	12	21
Benchmarking	14	20	38	11	9	21	20	10	14	18	11	13	5	9	20	14	39	14	4	30	2	336	11	21
Measurement	11	8	48	14	11	10	7	4	18	22	9	9	11	24	16	11	7	25	3	7	6	281	9	21
Cycle time	20	7	8	10	22	11	8	6	39	30	32	8	7	21	17	18	13	25	2	14	7	325	10	21
ISO	30				23					1	8	38		32	25	34					16	207	7	9
VOC				4	4	42	18		6	4	47	12			44	21					2	204	6	11
SWOT	20		6	5	9		9	1	4	8	35	7	1	10	26	12	4	8		5		170	5	17
Scorecard	31	6	23		4	1			5	4	2			4	32	6	9	5	1			133	4	14
Collection	3	12	6	2	9	5	12	5	10	5	4	9		6	3	1	9	3	2			106	3	18
Root cause	4	3	8	3	5	3	3	8	9	4	8	4	4	5	10	7	8	3		6		105	3	19
Gap analysis	3	3	10	5		6	1		1	10	2	4		3	3	8	1	2				62	2	15
Interviews	1	5	2	3	6		5		3	2	2	1	7	3	2	5	3	7	2	2		61	2	18
Waste mgmt.	4	2	1	1	1	1	1				1	11		9	3	1	4	2		11		53	2	15
Total																						3179		

Discussion

The results of this study show that the winners of the Malcolm Baldrige National Quality Award from the small business category have often used several process improvement techniques that can be benchmarked by other small organizations. The results provide both the number of organizations that implemented a process improvement technique and the number of references to the technique, thereby indicating the importance of the technique to the small business organizations in the study's sample.

Strategic planning was the most frequently referenced process improvement technique, with 768 references across 13 applications. Eight applications, however, did not mention this technique. This is probably due to the size of the business organization. Relatively large business organizations tend to possess enough resources to conduct a formal strategic planning process. Whereas relatively smaller business organizations tend to engage in planning loosely and intuitively, and do not allocate any resources to formal planning. For example, Bristol, Tennessee, used strategic planning 117 times in its application when describing its operations and processes. The company employed 68 full-time employees and three part-time employees in 2016 and generated $26 million in revenues. Pro-Tech Coating, however, did not reference all strategic planning.

Strategic planning requires clear goals, data analysis, and formal plans. Relatively large businesses with enough resources tend to adopt strategic planning for performance improvement. This type of organization maintains that organizational policymaking must be driven by a formal planning process. The setting of unambiguous goals via detailed formal plans and formal analysis of business policy options are basic tenets of strategic planning. It aims at improving processes by predicting environmental changes, setting clear objectives, and developing strategies to achieve these objectives.

Surveys, as a practice used to improve processes, were the second most referenced technique and were used by all organizations in the sample. The technique was referenced 368 times. Surveys are mainly used for customer and employee data collection. They provide organizations with insights into improving processes and workplace environments, and competitor analysis. Data collected from customers through surveys helps business organizations measure their customers' satisfaction with their offerings and identify areas of strength and weakness. Surveys are used as market research tools and provide valuable information on customers' needs, preferences, and perceptions about the business brand. They also help organizations gauge job satisfaction, employee engagement, and inform other concerns of the workplace dynamics. In addition, businesses use data collected from surveys to inform their process improvement initiatives. They collect feedback on internal processes and systems, industry trends, and competition. Data collected often helps decision-makers make informed business decisions.

Benchmarking, measurement systems, and cycle time were all cited by all companies in the sample. Benchmarking came third in terms of the number of references. All 21organizations in the sample referenced benchmarking with 336 references. Benchmarking can be internal, competitive, functional, and generic. Internal benchmarking consists of comparing internal functions of the same organization with one another. Competitive benchmarking is concerned with comparing different organizations from the same industry. The Baldrige award application instructs applicants to describe their performance in comparison with their direct competitors and industry standards. Functional and generic benchmarking compares organizations from different industries with similar processes. Measurement systems are used to provide businesses with reliable and accurate data to identify variability, monitor performance, perform root cause analysis, validate improvements, standardize processes, and allow for data-driven decision making,

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among other uses. Businesses rely on measurement systems to deploy and implement many tools and techniques for process improvement. Statistical process control (SPC), key performance indicators (KPIs), measurement systems analysis (MSA), control charts, and DMAIC are all widely used Six Sigma and process control techniques whose effectiveness depends on reliable measurement systems. Measurement, in general, is at the heart of process control and improvement. Cycle time is another technique cited, as expected, by all the 21 organizations in the sample. It is a lean technique and a key metric in process improvement. It was referenced 325 times by the winners. Cycle time is essentially used as a measure of efficiency. It measures the time it takes to complete a task or one cycle of a process and helps identify areas for optimization.

ISO audits, although used by only nine organizations from the sample, ranked higher than several other techniques with 207 references. Its uses made up 7% of the total references. ISO audits are systematic evaluations of an organization's processes, systems, and procedures of its compliance with International Organization for Standardization (ISO) standards. These audits are important as they help organizations stay abreast of industry's best practices and identify inefficiencies and gaps. ISO audits are mainly internal and external ones. Internal audits are often performed to prepare for an external one. They are conducted by an internal audit team and consist of an assessment of the conformity of internal processes with ISO standards. External audits, on the other hand, are conducted by an external auditor such as an independent, accredited certification body.

Voice of the customer (VOC) is the process of providing customers with an opportunity to engage with businesses. Customers, through surveys, interviews, focus groups, and other means, express their expectations, preferences, and aversions about their experiences doing business with a company. Voice of the customer techniques allow companies to collect direct feedback from the consumers of their products and services. Decision-makers use feedback to guide their decisions and effectively address their customers' needs and preferences.

The SWOT analysis and the scorecard were also used by the studied organizations. They are both general management tools that contribute to the process improvement efforts. SWOT is a strategic planning tool used to evaluate internal strengths and weaknesses and external opportunities and threats. It is a relatively simple technique to use and does not require additional resources. Hence, it is widely used by both small and large organizations. Small organizations, with limited access to resources, use it in lieu of a formal strategic planning process. Business companies identify their strengths and weaknesses to guide their growth decisions, while the identification of threats and opportunities helps manage and mitigate risks. SWOT was referenced 170 times by 17 organizations from the sample. The scorecard is a performance management tool that helps managers track and evaluate organizational progress. It involves the selection of key performance indicators (KPIs) that serve as benchmarks for evaluating results and progress. Perhaps the most widely used form of scorecard is the Balanced Scorecard (BSC), which focuses on four areas of performance: financial, internal process, and learning and growth. The scorecard tool was cited 133 times by 14 organizations.

Root cause analysis, gap analysis, and waste management are specific process improvement techniques and were cited 105, 62, and 53 times, respectively. Although these techniques were not cited as many times as the previously mentioned ones, it is important to note that they were used by most organizations in the sample. Their citations were probably limited to the process management section of the application. Root cause analysis was used by 19 organizations, and both gap analysis and waste management were used by 15 organizations.

Conclusion

This study examines how Baldrige Award-winning small organizations have implemented specific process improvement techniques that contributed to their exceptional performance. The goal was to identify these techniques and recommend them as benchmarks for other small businesses. Due to the limited sample size, no statistical inferences or cause-and-effect relationships were established. However, the study provides a valuable framework for benchmarking common process improvement practices among high-performing small businesses. The findings offer practical insights to help other small organizations enhance their operations.

The identified techniques, along with other contributing factors, have been instrumental in helping successful organizations achieve operational excellence. These organizations have created environments recognized by the U.S. Department of Commerce for fostering high performance.

Future research should expand the sample size to include additional Baldrige Award winners from various industries. A broader dataset would enable more robust statistical analysis. This type of research is essential for identifying process improvement techniques used by top-performing companies. While this study focused on Malcolm Baldrige National Quality Award winners in the small business category, the approach can be applied to winners of other performance-based awards as well.

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