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Effectiveness of Business Process Improvement for Equipment Financing Companies

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TABLE OF CONTENTS

PROBLEM STATEMENT

Although some Business Process Improvement (BPI) initiatives have been implemented by equipment financing companies for years, there is inconsistent adoption and coordination of different BPI practices. What are the differences in deployment and success among the BPI program types, such as general, customer-supplier, Six Sigma, and lean management categories? Does BPI program adoption and efficacy depend on the size or type of the equipment finance firm? Are there underutilized BPI tools which would provide a competitive advantage if added to an existing program? How do core technology applications affect the outcome of various BPI tools? Which BPI initiatives could benefit from better coordination of core technology applications? These issues and related implications are addressed in this report.

EXECUTIVE OVERVIEW

This study examines the success of BPI practices for the equipment finance segment. Previous research for the greater financial services industry, of which equipment finance is a member, has shown BPI initiatives to be effective in general for enhancing service quality, productivity, cost savings, error reduction, and delivery time. This study assesses the effectiveness of BPI practices by interviewing executives at 30 equipment financing companies concerning the efficacy of general, customer-supplier, Six Sigma, and lean management BPI practices. A unique contribution of this research is an appraisal of the linkages of BPI characteristics, such as BPI implementation and program results, with four company characteristics: 1) type of firm (including bank-related, captive, independents, and multi-line), 2) firm size, 3) market size, and 4) type of underlying, core technology.

A well implemented BPI program would be beneficial for a financing company, regardless of its characteristics.

Generally speaking, this study finds that the use of BPI practices is common among the study respondents, irrespective of the firm being a captive, independent, bank-owned, or multi-line finance company. While most firms in the study use BPI practices in some form, the overall findings suggest variable rates of deployment for each of BPI, with some of the lesser-utilized BPI tools rated as more effective. As listed in Figure 1, BPI tools include activities and practices associated with each of the 4 BPI tool categories: 1) general, 2) customer-supplier, 3) Six Sigma, and 4) lean management tools. This study finds that it is common for companies to deploy about two or three BPI tools from each category, with the greatest number of tools from the general BPI category and the least from the Six Sigma tools. Aligning the 23 BPI tools with the three stages of organizational change suggests that the most common practices are for the diagnosis stage, a moderate number for the improvement stage, and only two BPI practices for the learning stage.

This study indicates differing effectiveness for the 4 BPI categories and 23 tools. BPI tool effectiveness is defined as quality improvement, customer satisfaction increase, cost savings, reduced frequency of errors, and reduced severity of errors. For commonly implemented BPI practices, some tools are found to be effective for each category. Specifically, frequently deployed tools include general practices (such as employee recognition, teams, and Plan-Do-Check/Study-Act method), external initiatives (such as customer satisfaction measures, competitive benchmarking, and Critical-To-Quality metrics), Six Sigma practices (such as project reviews, Define-Measure-Analyze-Improve-Control process, and Statistical Process Control), and lean initiatives (such as process mapping and kaizen). According to a financing company's Vice President of Operations, these basic initiatives (as listed in Figure 1) are essential to drive programs for capturing new ideas from employees and problem solving. Other executives report the need for employee recognition, teams, and BPI projects to drive a "process improvement mentality".

However, some of these common BPI tools are related to only one of the program results, such as BPI teams with quality improvement results, employee rewards with net cost savings results, and customer satisfaction measures with customer satisfaction increase. So these basic BPI practices do achieve their goal of improving effectiveness, but for only those specific outcomes. More advanced common tools, for example benchmarking, CTQ metrics, DMAIC, and process mapping, are significantly correlated with at least 4 of the 5 program results. These intermediary and more time-consuming practices improve a broader spectrum of results. As a financing company president stated, more advanced tools such as process mapping result in streamlined operations that allow the firm to expand into new types of business. Furthermore, some of the most sophisticated and least deployed tools, such as Failure Modes and Effects Analysis, Black Belt or Green Belt training, fail-safing, and Supplier Quality Evaluation, also correlate significantly with at least 4 of the 5 results metrics. Deployment of some of these least common BPI tools, in addition to the proven baseline tools, would provide a more highly effective program overall.

Figure 1. BPI Tools for Each of Four Types of BPI Initiatives

	Basic Initiatives	Advanced Initiatives
External Orientation	**Customer-Supplier Tools:** Customer satisfaction measures Critical-to-quality metrics Quality Function Deployment Supplier quality evaluation Competitive benchmarking	**Six Sigma Initiative:** Statistical process control DMAIC Black-Green Belt training Project reviews and closure
Internal Orientation	**General BPI Tools:** Plan, Do, Study, and Act Process improvement teams Employee recognition Failure Modes Effects Analysis Andon Poka-Yoke Design of Experiments	**Lean Management:** "5S" principle Process mapping Kaizen or Kaizen event Value stream mapping Redesign for one-piece flow SIPOC Just-In-Time

A well implemented BPI program would be beneficial for a financing company, regardless of its characteristics. Digging deeper into the interview information reveals novel insights on the effects of equipment finance company characteristics and the relationships with core technology applications. Surprisingly, the four company characteristics (firm type, size, market, and technology) do not have an overall impact on the adoption or success of BPI tools. Also, some firms have started BPI initiatives for a specific segment of their business, and later expanded the BPI program scope as the benefits became apparent.

As a Senior Vice President remarked, BPI was not perceived to be needed for large ticket deals, but recent use of process mapping for other markets proved so successful that they realized it should have been initiated for all of their business years ago. Also unexpectedly for all firm types, sizes, and markets, the most often deployed BPI tools (customer satisfaction evaluation, employee rewards, and teams) do not result in the highest combination of quality improvement, customer satisfaction increase, net cost savings, and reduced frequency and severity of errors. Some lesser utilized BPI tools result in greater overall benefits for all company types, sizes, and markets, suggesting competitive advantages for all financing firms that implement uncommon BPI practices well.

Greater utilization of financing technology applications relates highly to the success of general and customer-supplier BPI tools. A financing executive stated the need to extensively use process mapping as the business has evolved to a more ambitious business strategy and has adopted more sophisticated IT systems. So for the Six Sigma and lean management tools, their effectiveness may depend on the coordination of those tools with financing technology applications, such as when a financing CEO described the use process mapping with a cross-functional team of IT and Six Sigma trained employees.

Many firms are successfully introducing BPI tools along with the improvement of their IT systems. For example at a financing company, the implementation of process mapping plus enhancing the technology configuration resulted in the elimination of thirty unnecessary steps for the credit department and reduced throughput time for the origination department. However, changes in technology applications require employees to work alongside the IT staff and can take months to implement, as a Senior Vice President remarked. Therefore, this study points toward new directions for the adoption of underutilized but more effective BPI practices, especially Six Sigma and lean management tools, and more sophisticated IT systems, for all types of financing firms.

The financing executive interviews for this study finished with their advice about lessons learned for improving BPI programs. These insights focused on several suggestions, such as employee process improvement mentality and practical training, common understanding of BPI tools, a "bubble-up" deployment approach, management buy-in, cross-functional project teams, small dedicated BPI staff, realistic improvement goals, and selection of the most appropriate BPI tools (such as benchmarking, CTQ metrics, DMAIC, and process mapping). The Six Sigma tools received the greatest attention due to a perception they are an "all-or-nothing" option. Some financing executives opined that Six Sigma tools were too expensive with a distant or insufficient payoff. Moreover, a BPI Director expressed the concern that a universal Six Sigma program could sink the entire organization due to costs and the lengthy cycle time for employee training and process implementation. Also executives commented on how some firms have over emphasized Six Sigma and on the challenge to engage all employees in more complex BPI tools. However, this study reveals that the less utilized Six Sigma and lean practices are actually highly related to many facets of BPI program success.

For example at a financing company, the implementation of process mapping plus enhancing the technology configuration resulted in the elimination of thirty unnecessary steps for the credit department and reduced throughput time for the origination department.

Many financing executives remarked how the implementation of BPI practices has evolved over the last several years. Also, a CEO reported the recent trend toward more education and a "strong lean champion" to encourage middle-to-low managers to adopt lean practices in spite of their time consuming nature. In addition, larger firms maintain a dedicated BPI staff to direct projects and lead managers in working with BPI teams. Many executives encourage the selection of the right BPI tools for each scenario, training for employee understanding of each tool, and choice of appropriate metrics to track results. Therefore, most financing companies are engaged with many of the basic BPI practices but there are considerable opportunities for expanding BPI adoption toward more of the advanced and generally effective BPI tools.

INTRODUCTION

The lifecycle of originating and servicing an equipment finance transaction consists of many business processes. If not consistently evaluated for fitness of purpose and effectiveness over time, these processes can become outdated, poorly coordinated, and inefficient. In order to streamline financial processes, BPI initiatives have been shown to be effective in general for enhancing service quality, productivity, cost savings, error reduction, and delivery time, as reported by Gowen and Johnson (2009) for equipment finance firms. This study expands on the previous literature by distinguishing among four principal BPI program types, 1) general, 2) customer-supplier, 3) Six Sigma, and 4) lean management categories, and by reviewing several BPI tools for each type.

As presented earlier in Figure 1, general BPI tools are basic and internally-oriented, customer-supplier tools are basic and externally-oriented, Six Sigma tools are advanced and externally-oriented, and lean tools are advanced and internally-oriented. When choosing among the types, there are tradeoffs for cost and benefit, as diagrammed in Figure 2. In general, BPI general tools are low-cost/low-value, customer-supplier tools are high-cost/low-value, lean tools are low-cost/high-value, and Six Sigma tools are high-cost/high value (Arthur, 2011). Furthermore, there are several contingency factors which could have a moderating effect on the effectiveness of BPI practices. The impacts of BPI initiatives on corporate results are commonly believed to depend on company characteristics, such as firm size, and technology. Therefore, this study assesses the degree that company size, type, and technology affects the success of the four types of BPI programs.

Figure 2. BPI Program Initial Cost versus Immediate Value for Four Types of BPI Tools

	High Immediate Value	Low Immediate Value
High Initial Cost	Six Sigma Initiative	Customer-Supplier Tools
Low Initial Cost	Lean Management	General BPI Tools

General Process Improvement Practices

Successful process improvement programs usually consist of several general BPI practices, such as a defined project methodology, employee teams, employee recognition for program accomplishments, process design, and error-resolution tools. Empirical results have shown that quality management practices contribute to process enhancements, quality improvements, customer satisfaction, and corporate competitiveness (Evans and Lindsay, 2011). The general process management practices can involve several tools, such as PDCA/PDSA (Plan, Do, Check/Study, and Act), employee teams for process improvement, employee recognition and rewards for BPI program success, Failure Modes and Effects Analysis, Andon, Poka-Yoke, and design of experiments. Each of these general BPI practices has its own features, value-added, contingencies, and metrics.

The PDCA/PDSA cycle was popularized by W. Edwards Deming based on his quality improvement efforts for Japanese corporations in the 1950s (Evans and Lindsay, 2011). The Plan stage includes examining the current state of a process and then formulating potential solutions to problems. The Do stage is a pilot test of a proposed process improvement. The Check/Study stage assesses whether the trial intervention is successful and adjusts the process improvement plan accordingly. Finally, the Act stage standardizes the final process method and informs others about it for deployment by other units. The purpose of the PDCA/PDSA cycle is to continuously update business processes and provide new best practices for all units of an organization. Usually, the PDCA/PDSA cycle is implemented by *employee teams for process improvement* so they can take advantage of a diversity of team member skills, experience, and knowledge in defining a problem and arriving at a solution superior to any individual idea. As a result of process improvement efforts, *employee recognition and rewards for BPI program success* (on an individual, team, or unit basis) can be implemented to promote individual, team and organizational performance. At financing companies, executives have been reported to observe that rewards and recognition are critical for reinforcing employee behavior in a successful BPI program (Gowen and Johnson, 2009).

Failure Modes and Effects Analysis (FMEA) assesses the modes or ways a process can fail, examines the chance and severity of the effect on customers, seeks possible causes of failures, and establishes corrective action and controls. FMEA can reduce errors, costs, and cycle times (Evans and Lindsay, 2011). The *Andon* concept is real-time process control system which provides visual signs so employees can take immediate corrective action, such as a red light or pop-up message to alert workers to stop a process and fix it right away. As a proactive control method, *Poka-yoke* (fail-safing or mis-

take proofing) includes process design to avoid errors, error identification system to stop an error from occurring, and detecting input and exit errors. To further reduce process errors, *design of experiments* (DOE) is a testing method that establishes a test or series of tests to determine which process provides superior results and fewer errors.

Customer, Supplier, and Competitive Practices

Process improvement programs usually involve some externally oriented practices, including customer satisfaction, supplier quality, and competitive assessment initiatives. To enhance marketplace position, companies must address these external constituencies. Most firms have adopted customer satisfaction assessment, critical-to-quality metrics, quality function deployment, supplier quality evaluation, and competitive benchmarking.

Customer satisfaction assessment consists of utilizing measures which examine customer preferences, identify causes of dissatisfaction, determine business processes that optimize satisfaction and loyalty, and follow trends to assess how well process improvements enhance customer satisfaction and retention (Evans and Lindsay, 2011). Customer satisfaction methods, such as surveys and focus groups, reveal the "voice of the customer" (VOC). At Wachovia Corp., the application of the VOC technique drove the customer satisfaction rating up by 20%, customer loyalty up 26%, and customer attrition rate down from 20% to 12%, with 16% annual earnings growth over five years (Hayler and Nichols, 2007). By determining critical-to-quality (CTQ) metrics of those service characteristics which are vital for customer satisfaction, the company can track how well CTQs are fulfilled and make adjustments to their service delivery as needed. Furthermore, *quality function deployment (QFD)* is an analytical tool that plots the relationships between customer service requirements and technical requirements on a chart resembling a house (with a "roof" of interrelationships, hence often referred to as a "house of quality"). Alternatively, *supplier quality evaluation* consists of assessing errors of services provided by a company's suppliers. Finally, *competitive benchmarking* means evaluating a company's processes against those that are best-in-class at other firms. The goal is to realize breakthrough process improvement by adopting innovative industry leading practices.

Six Sigma Practices

Six Sigma is an initiative consisting of several tools to improve processes by focusing on the results most critical to customers. Six Sigma teams involve employees who are highly trained in statistically oriented practices, such as *Statistical Process Control*, that plots the time-based progress of some key metric, such as loan delinquencies, to detect out-of-control issues that need to be addressed (Summers, 2007). A survey reveals that Six Sigma is used by more than 50 of the top 100 financial service firms (Hayler and Nichols, 2007) because it enhances transaction accuracy and speed while reducing costs, such as search, information technology, decision, and monitoring costs (Arthur, 2011). At financing companies, executives have observed that all Six Sigma tools need not be used; rather, the basic elements can be selectively implemented to fit with an overall BPI program (Gowen and Johnson, 2009).

Problem-solving projects require a methodology called *DMAIC (Define, Measure, Analyze, Improve, and Control)*. It incorporates a wide variety of statistical tools and process improvement techniques. Started in 2001, Bank of America's Six Sigma program resulted in decreasing errors by 24% in all customer channels and by 88% in electronic channels, reducing transaction cycle times by more than half, adding $2 billion in profit, and increasing "customer delight" (defined as a rating of 9 or 10 out of 10) by 30% (Cox and Bossert, 2005).

The Six Sigma team success depends on *Black Belt and Green Belt* training for employees. During the first year, employee volunteers are trained as Black Belts in advanced statistical techniques, team-building, and project-selection skills and are committed full time as the leaders of a Six Sigma team. Green Belts are usually staff workers who are trained in basic quality tools and are assigned to teams on a part-time basis. For financing companies, executives report that training is important to engage employees for a more successful bottom-up approach to BPI. An extensive training program at Capital One provided dramatic results from 2005 to 2007, such as a 39% reduction in the cost of a new account, 54% lower servicing cost in existing accounts, and customer satisfaction improvement of 10% (Immaneni et al., 2007).

Finally, Six Sigma requires *project reviews and project closure* to determine the success of each project and to be able to communicate the resulting best practices throughout the company. For the Six Sigma program initiated in 2001 at HSBC, N.A., project reviews and closure demonstrated that customer complaint projects saved $1.6 billion annually, training guideline improvements reduced turnover by 10%, and sales leads priorities projects produced $9.5 billion annual savings (Gordon, 2006).

Lean Management Practices

Lean management initiatives have emerged recently as a potential source of greater competitiveness for equipment finance firms. The purpose of lean methods is the relentlessly pursuing waste elimination, lowering costs, and increasing the speed of delivery of products and services to the customer (Womack and Jones, 2005). In addition to reduction of the seven common waste sources (that consist of defects, transport, motion, backlog, processing, over-delivery, and waiting), lean initiatives decrease non-obvious sources, such as application, tracking, promotional, analysis, automation, and reporting waste (Schonberger, 2008). One of these lean practices, the *5S principle*, reduces waste by observing inefficient processes and then deploys five steps: 1) Sort for necessity, 2) Simplify the workplace, 3) Shine for cleanliness, 4) Standardize processes, and 5) Sustain standard processes (George et al., 2005).

There are other initial approaches to lean management. *Process mapping* requires the analysis of individual steps and leads to potential efficiencies by redesigning the process to eliminate unessential elements. In more detail, *value stream mapping* visually displays the process flow, distinguishes between value-added and non-value-added activities, assists in pointing out root causes of waste, identifies problems and opportunities for improving workflow, and shows how the future workflow would look (George et al., 2005).

Kaizen (continuous improvement) or Kaizen event projects are implemented by a team or an entire small department, with the assistance of process improvement experts (Arthur, 2011). The workflow process for an area can be redesigned in a five-day Kaizen event which consists of the first day to train team members and define the problem(s); second day to measure and analyze workflows, cycle times, and value stream maps; third day to generate and test improvement alternatives; fourth day to simulate and deploy the selected solution; and fifth day to evaluate and report out to management. For example, Bank One's National Enterprise Operation (NEO) launched lean management based on the Kaizen event approach and encouraged voluntary employee participation in 2002 and fully implemented it by 2004, when it was acquired and became a division of JPMorgan Chase (George, 2003). The results include cycle time reductions of 30% to 70%, improved revenue, and decreased costs of thousands of dollars per event.

Redesign for one-piece flow (cell design) assembles all of the necessary work activities for a process into a cell layout, such as streamlining financing application steps to reduce errors and duplication of effort (Arthur, 2011). Furthermore, *SIPOC (Suppliers, Inputs, Processes, Outputs, and Customers)* is a technique for assessing the entire flow of a business to detect opportunities for improving efficiency. Finally, *Just-In-Time (JIT)* process management eliminates waste and streamlines operations through reduction in waiting time delays, inventories, employee motion, and transportation.

FINDINGS

This study examines the relative effectiveness of BPI types, BPI tools, and company characteristics which are predicted by the previous literature to be important for the success of a BPI program. BPI effectiveness is measured as the extent of quality improvement, customer satisfaction increase, cost savings, reduced frequency of errors, and reduced severity of errors. Detailed data tables of interview results can be found beginning on page 14. The sample, measures, and interview process are discussed in the Study Methods section near the end of this report.

Figure 3. Number of Companies for Each of Four BPI Success Conditions

	High BPI Implementation	Low BPI Implementation
High Degree of Results	9 firms	5 firms
Low Degree of Results	4 firms	12 firms

For the 30 firms studied, the overall program success profile, as diagrammed in Figure 3, indicates that the implementation of a greater number of BPI tools generally produces a higher degree of program results. But more detailed analysis described below suggests the adoption rate for each of the 23 BPI practices is highly diverse, with some of the lesser-utilized BPI tools producing greater results than more commonly used BPI tools. Likewise, some of the firms with high BPI implementation achieve a low degree of results. Financing company characteristics (such as size, type, market, and technology) prove to be not universally important for BPI tool adoption and success. Reasons for these unexpected findings may be suggested by the rationale for Figure 2, that is, the more effective BPI tools are less utilized due to perceived high initial cost and low immediate value. Then the finer grained look below at BPI programs reveals which types, tools, firm characteristics, and technologies are more effective for financing companies.

For the findings presented in Table 1, the five most commonly deployed BPI tools are customer satisfaction measures by surveys, employee recognition or rewards for BPI program success, process mapping, process improvement teams, and competitive benchmarking of best-in-class processes. For the sample of 30 financing companies, more than half of the firms adopt some BPI tools for each of the four categories. BPI tool implementation presented in Table 2 reveals that each company uses an average of 1.5 to 2.8 BPI tools for each category. The unusual distribution for Six Sigma shows an all-or-nothing approach, with 13 firms neglecting it and 11 companies embracing at least 3 of the 4 tools. Again, the previous rationale in Figure 2 suggests that low Six Sigma use results from high initial cost and low immediate value. Overall, this pattern indicates widespread familiarity with BPI practices, as well as potential opportunities for expanding BPI adoption toward more of the advanced and underutilized BPI tools.

A different picture emerges when BPI practices are aligned with Lewin's three stages of organizational change: 1) unfreezing, 2) moving, and 3) refreezing behavior (Burnes, 2004). In the context of BPI practices, unfreezing corresponds to diagnosis of a problem or opportunity, moving relates to the actual process improvement, and refreezing means employee learning by institutionalizing the new behavior and improvement gains. Accordingly, 6 of the 12 more frequently used BPI tools are associated with the diagnosis stage, 4 of the 12 common tools with the improvement stage, and 2 of the 12 common tools with the learning stage, as represented in Table 3. This pattern implies that financing companies are adept at identifying problems, but adopt fewer BPI tools in the improvement and learning phases. These latter two stages provide the opportunity for firms to engage employees with direct process improvement actions and lasting results. Therefore, enhanced deployment of BPI tools in the improvement and learning phases would promote better use of unique human resources and produce greater competitive advantage, as diagrammed in Figure 4.

Figure 4. Competitive Advantage Increases with Higher Stage of Organizational Change

The findings address an issue of the general effectiveness of BPI systems for different financing company characteristics, such as type, size, and market. Conventional thought advocates the applicability of BPI for only certain types of firms, for example large or high-volume/small-ticket companies, but the results of this study indicate otherwise. There are some apparent differences for the

number of BPI tools used per firm for each of the three company characteristics in Table 4. For example, the least number of Six Sigma tools is reported for banks and the most number of lean tools is for captive/vendor firms. Likewise in Table 5, the least degree of BPI results appears to be for financial institutions and the highest degree of results seems to be for captive/vendor companies. However, chi-square tests of the data in Tables 4 and 5 demonstrate no statistically significant overall differences based on each characteristic. Therefore, regardless of type, size and market, a financing company would benefit from a well implemented BPI program.

The effectiveness of each BPI tool is examined by the degree of association with the five BPI program effectiveness metrics. As in Table 6, there are 19 BPI tools that correlate positively with some result metric and 16 tools which correlate positively with overall program results. All of the significant correlations are positive, which suggests that BPI tools are beneficial when there is an effect. However, some of the most commonly implemented BPI tools, such as teams, rewards, and customer satisfaction measures, do not significantly correlate with overall program results (which is a combination of the five result metrics). The reason appears to be that the results are limited to the most relevant outcome for each of these three BPI tools. For example, the only significant correlations are teams with quality improvement, rewards with net cost savings, and customer satisfaction measures with customer satisfaction increase. These basic BPI practices do achieve the goal of improving effectiveness but only for that specific outcome. In contrast, the BPI tools which correlate significantly with at least 4 of the 5 results metrics are some of the least deployed tools, such as FMEA, Black Belt or Green Belt training, CTQ metrics, benchmarking, fail-safing, DMAIC, process mapping, and SQE. The reasons may focus on the high initial cost and low immediate value of these BPI tools, as in the discussion of Figure 2. Selective implementations of some these overlooked BPI tools could provide opportunities to gain a competitive advantage over firms which do not deploy them. Furthermore, the overlooked BPI tools would continue to produce a long-run payoff to justify the greater initial cost.

The effectiveness of financing technology applications is limited currently to general and external types of BPI tools, which implies there would be an advantage for a firm developing better ways to coordinate technology with Six Sigma and lean practices. The software applications deployed by financing firms for each type of technology are presented in Table 7. Although all financing companies use some technologies, there is a wide range of types and degree of adoption of these applications. The effectiveness of all four types of BPI tools is demonstrated by the significant positive correlations with the number and degree of BPI program results in Table 8. Therefore, greater use of BPI tools is related to higher program benefits, for all types of BPI practices. More importantly, technology applications are also effective, as evidenced by the significant positive correlations with the number and degree of BPI results in the last two rows of Table 8. This demonstrates a compelling need for technology platforms to support BPI programs. In deploying new BPI tools, companies would benefit from examining a variety of technologies and choose an application appropriate for a BPI initiative. Likewise, a financing executive stated that new technology applications must fit with the corporate strategy and BPI program. However, technology applications are significantly correlated with only general and external BPI tools, indicating that greater use of only those tools is related to improved technology applications. The lack of relationships with Six Sigma and lean tools suggests another potential opportunity which could be turned into a competitive advantage for firms coordinating Six Sigma and lean practices better with technology applications. New technologies and more advanced BPI tools could be implemented together. Financing companies may need to replace older, legacy-based systems with more sophisticated technology applications in order to capture the greatest benefit from more complex BPI initiatives, such as Six Sigma and lean tools.

Program success depends on a participative approach, management buy-in, employee training, and hands-on experience by assignment to a project team.

Lessons Learned

Findings from the executive responses to the open-ended question on lessons learned yielded a wealth of advice about BPI programs. For the general BPI practices, financing executives stressed the need for employees to have a "process improvement mentality", know BPI language, and understand BPI tools. Often, program success depends on a participative approach, management buy-in, employee training, and hands-on experience by assignment to a project team. Many financing executives emphasized cross-functional project teams with different experts, including a team member trained in BPI tools. Some executives reported the adoption of a more formal structure with a director of process improvement, small dedicated BPI staff, managerial ownership of BPI proj-

ects, and slow voluntary team approach. Finally, programs excel when teams identify an improvement goal and then seek an appropriate BPI tool.

Suggestions about the deployment of external BPI tools vary greatly with each firm's business situation. Equipment finance company executives ascribed high value to customer and employee satisfaction surveys, peer reviews, and frequent feedback which drive new BPI projects. About half of the financing firms conduct formal annual customer satisfaction surveys and focus groups of varying frequency. In addition, most companies rely on some combination of quarterly surveys, monthly surveys and checkpoints for certain markets, and informal weekly contact for high profile customers. Occasionally, an annual roundtable of top customers provides insights on key financing issues. Another nearly universal practice is benchmarking best-in-class processes to track industry trends, research new markets, and review progress on vital metrics.

Some executives describe Six Sigma as very expensive and the payoff too distant or insufficient for their large ticket and low volume market, as implied by the Six Sigma characteristics in Figure 2. Six Sigma is also perceived as requiring a bureaucratic structure which is appropriate only for large corporations. However, Six Sigma programs have been reported as successful in many case studies (George, 2003; Hayler and Nichols, 2007; Immaneni et al., 2007). This study demonstrates the success of Six Sigma for several of these financing companies, which is consistent with previous research (Gowen and Johnson, 2009).

In contrast, the commentary on lean management tools suggests many opportunities for the future. Several companies have supplemented or replaced Six Sigma practices with lean initiatives, due to the lower immediate cost implied in Figure 2. Another firm experimented unsuccessfully with lean tools years ago, only to better implement lean tools recently by creating a company lean champion, delivering greater lean training for all types of employees, and securing active participation from middle-to-low level managers. Some executives expressed regret about not adopting lean practices years ago. An overall theme expressed by the financing executives is to get and stay lean to become more competitive in today's changing business environment.

The lessons learned about technology applications stress the need for greater flexibility and continuous improvement. As more sophisticated BPI practices are implemented, financing platforms must be more comprehensive and adaptable. More flexible technology applications are also required for the rapidly dynamic environment.

However, successful BPI initiatives are deployed slowly, so pushing change too fast or much will prove to be counterproductive. This perspective is captured by an observation of a financing executive who cited the principle of Occam's razor, which can be applied in this case as avoiding unnecessarily complex BPI tools and technology when simpler systems suffice for similar conditions.

CONCLUSIONS

BPI initiatives can effectively streamline financial processes in order to enhance service quality, productivity, cost savings, error reduction, and delivery time, as demonstrated by this study and previous research for equipment finance firms (Gowen and Johnson, 2009). However, the present study shows that utilization of commonly adopted BPI practices, such as customer satisfaction measures, employee recognition or rewards, process mapping, improvement teams, and competitive benchmarking, is not a source of differentiation in the asset finance space. With this said, competitive advantage could be achieved by implementation of some of the least used yet effective BPI tools, such as FMEA, Black Belt or Green Belt training, CTQ metrics, benchmarking, fail-safing, DMAIC, process mapping, and SQE. The key for a successful program would be selectivity in choosing an appropriate set of BPI tools for a company. To implement a BPI program successfully, a starting point could be the formation of an executive council to assess company needs, determine the structure for a BPI program, and establish direction for the implementation of BPI practices.

Differences in the utilization rates of the four types of BPI tools are not important overall among the categories they are based on. Likewise, overall BPI program success does not depend on company type, size and market, for outcomes such as greater quality improvement, customer satisfaction, net cost savings, and reduction of error frequency and severity. These unexpected relationships suggest that a BPI program can be implemented effectively for any type of firm. However, there are some fine grained exceptions. Compared to the other results metrics, financing companies could achieve greater results for reduction in frequency and severity of errors by expansion of Six Sigma and lean tools, which are reported to be underutilized so far. Also, the number of BPI practices could be favorably expanded for those categories with the lowest deployment of BPI tools, such as for banks and independents, smallest and larger companies, and small ticket and financial institution markets.

The variety of financing technology applications leads to different implications for the types of BPI tools. For the general and external BPI practices, such as improvement teams, employee rewards, customer satisfaction measures, and benchmarking, there appear to be strong links with technology applications. On the other hand, deployments of Six Sigma and lean BPI tools have not been strongly related to greater technology applications so far. The addition of new Six Sigma and lean BPI tools in coordination with specific technology applications would provide higher benefits.

A case in point used by one financing firm is process mapping for an overhaul of their technology application system. Another example could be launching DMAIC and Black/Green belt training with technology application projects. For future BPI program improvement, our findings indicate that technology applications need to be better integrated with deployments of Six Sigma and lean BPI tools for greater competitive advantages.

Table 1. Number of Firms and Degree of Implementation for Four Types of BPI Tools

Firms	Degree*	Business Process Improvement Tool
General BPI Management Tools		
28	3.17	Employee recognition or rewards for BPI program success
26	3.20	Process improvement teams of employees
12	1.23	PDCA (Plan, Do, Check, and Act) method
8	0.83	Failure Modes and Effects Analysis (FMEA)
3	0.30	Fail-safing (Poka-Yoke)
2	0.27	Andon
2	0.20	Design of experiments (DOE)
External (Customer, Supplier and Competitive) Tools		
29	3.43	Customer satisfaction measures by surveys, focus groups, etc.
21	2.33	Competitive benchmarking of best-in-class processes
9	1.03	Critical-To-Quality (CTQ) metrics
5	0.50	Supplier Quality Evaluation (SQE)
2	0.20	Quality Function Deployment (QFD)
Six Sigma Process Improvement Tools		
16	1.87	Project reviews and project closure
13	1.53	DMAIC (Define, Measure, Analyze, Improve, and Control) process
10	1.17	Statistical Process Control (Control chart, Pareto chart, Fishbone diagram)
7	0.90	Black Belt and Green Belt training
Lean Management Process Improvement Tools		
27	3.27	Process mapping
9	0.97	Kaizen or Kaizen Blitzes (continuous improvement events)
5	0.50	Value stream Mapping (VSM)
5	0.53	Redesign for one-piece flow
4	0.40	SIPOC (Suppliers, Inputs, Processes, Outputs, and Customers)
2	0.20	'5S' principles
2	0.23	Just-In-Time (JIT) process management

* Degree of implementation is rated as 0(none)-to-5(very high) for the extent of tool deployment

Table 2. Number of Firms that Deploy Each Number of Tools for Four Types of BPI Tools

Number of Tools	General Tools	External Tools	SixSigma Tools	Lean Tools
0	0	0	13	2
1	2	9	4	12
2	14	11	2	10
3	6	6	6	4
4	5	3	5	0
5	3	1	--	1
6	0	--	--	1
7	0	--	--	0
Average	2.77	2.23	1.53	1.83

Table 3. Number of Firms and Degree of BPI Tool Implementation for Three Stages of Change

Firms	Degree*	Business Process Improvement Tool
Diagnosis (Unfreezing) Stage		
29	3.43	Customer satisfaction measures by surveys, focus groups, etc.
27	3.27	Process mapping
21	2.33	Competitive benchmarking of best-in-class processes
10	1.17	Statistical Process Control (Control chart, Pareto chart, Fishbone diagram)
9	1.03	Critical-To-Quality (CTQ) metrics
8	0.83	Failure Modes and Effects Analysis (FMEA)
Improvement (Moving) Stage		
26	3.20	Process improvement teams of employees
12	1.23	PDCA (Plan, Do, Check, and Act) method
13	1.53	DMAIC (Define, Measure, Analyze, Improve, and Control) process
9	0.97	Kaizen or Kaizen Blitzes (continuous improvement events)
Learning (Refreezing) Stage		
28	3.17	Employee recognition or rewards for BPI program success
16	1.87	Project reviews and project closure

* Degree of implementation is rated as 0(none)-to-5(very high) for the extent of tool deployment

Table 4. Average Number of BPI Tools per Firm Deployed for Three Company Characteristics

	General Tools	External Tools	Six Sigma Tools	Lean Tools	Firms
By Type					
Bank	2.67	1.89	0.67	1.11	9
Captive	3.00	3.00	3.00	3.00	5
Independent	2.63	2.00	0.88	1.38	8
Multi-line	2.88	2.38	2.25	2.38	8
By Size					
Up to $100M	2.20	2.00	1.20	1.80	5
$100-500M	3.11	2.89	1.78	2.56	9
$500M-1.5B	3.00	2.22	1.00	1.33	9
$1.5-30B	2.43	1.57	2.14	1.57	7
By Market					
Sm. ticket	2.67	2.17	1.00	1.33	6
Mid. market	3.14	2.14	2.14	2.14	7
Financl. Inst.	2.36	1.73	0.55	1.09	11
Capt./Vendor	3.17	3.17	3.17	3.33	6

Table 5. Average Degree of Results* from BPI Tools for Three Company Characteristics

	Quality Improvement	Customer Satisfaction	Net Cost Savings	Lower Error Frequency	Lower Error Severity	Firms
By Type						
Bank	2.78	3.78	2.33	1.33	0.78	9
Captive	3.00	4.00	4.20	2.40	2.80	5
Independent	3.13	3.88	2.75	1.88	1.00	8
Multi-line	3.00	3.88	3.25	1.88	1.38	8
By Size						
Up to $100M	2.20	3.20	3.00	1.20	2.00	5
$100-500M	3.33	4.44	3.56	3.00	2.00	9
$500M-1.5B	3.11	3.67	2.44	1.11	0.89	9
$1.5-30B	2.86	3.86	3.00	1.57	0.57	7
By Market						
Sm. ticket	3.00	4.00	3.17	1.67	1.50	6
Mid. market	3.57	3.86	3.71	2.29	1.00	7
Financial. Inst.	2.36	3.64	1.91	1.00	0.45	11
Capt./Vendor	3.33	4.17	4.00	2.83	3.17	6

Table 6. Correlation of Degree of Implementation of 23 BPI Tools with Degree of Quality Improvement (QI), Customer Satisfaction Increase (CSI), Net Cost Savings (NCS), Reduced Frequency of Errors (RFE), Reduced Severity of Errors (RSE), and Overall BPI Results

Tool	QI	CSI	NCS	RFE	RSE	Overall
General BPI Management Tools						
PDCA	.202	-.001	-.055	-.042	.312*	-.074
BPI teams	.385*	-.034	.284	.040	.040	.217
Rewards	.141	.162	.372*	.022	-.115	.160
FMEA	.410*	.323*	.338*	.514**	.428**	.616***
Andon	.100	.271	.183	-.046	-.141	.084
Fail-safing	.398*	.239	.152	.485**	.634***	.594***
DOE	.287	.271	.183	.261	.198	.358*
External (Customer, Supplier and Competitive) Tools						
Customer Sat.	.295	.488**	.139	.010	.123	.283
CTQ	.418*	.278	.380*	.345*	.373*	.543**
QFD	.287	.151	.091	.415*	.536**	.467**
SQE	.010	.053	.306*	.308*	.472**	.369*
Benchmarking	.361*	-.034	.379*	.398*	.346*	.465**
Six Sigma Process Improvement Tools						
SPC/SQC	.279	.112	.412*	.346*	.302	.452**
DMAIC	.461**	-.047	.570**	.449**	.289	.548**
BB training	.308*	.083	.454**	.432**	.407*	.530**
Project review	.284	-.009	.443**	.459**	.227	.450**
Lean Management Process Improvement Tools						
'5S'	.194	-.207	.183	.261	.198	.221
Process maps	.458**	.140	.478**	.306*	.251	.499**
VSM	.214	.000	.219	.334*	.239	.324*
Kaizen event	.093	.277	.351*	.215	.358*	.388*
1-piece flow	.214	.098	.236	.430**	.330*	.415*
SIPOC	.422*	.135	.201	.440**	.447**	.525**
JIT	-.126	-.104	.181	.074	.543**	.195

Each correlation coefficient, on a -1(most negative) to 0(none) to 1(most positive) scale, is the degree of association between each BPI tool and each results measure, with the significance of the coefficient as * $p < .05$(low), ** $p < .01$(higher), or *** $p < .001$(highest significance)

Table 7. Software Applications Deployed for Each Type of Technology

Workflow Tools	Leasing Platforms	Bus. Rules Engines	Basic Software
Agile Technology	ABC(Warren-Selbert)	InfoAnalysis®	Lotus Notes
Ariba	ALFA (CHP)	SuperTRUMP	MS Access
Clarity	Application View	TValue	MS Excel
Crystal Reports	ASSET	proprietary	QI Macros
GDS Link	CapitalStream (HCL)		SAS
MS Sharepoint	CreditPath		SPSS
MS Visio	ExpressOS		
Siebel Workflow	GDS Link		
Visual Basic	InfoLease		
proprietary	Lease Sales Manager		
	LeaseComplete©		
	LeasePak (NetSol)		
	LeaseWave		
	MS COM		
	Oracle Lease Mgmt.		
	Rapport		
	SalesForce		
	TURBO-Lease		
	Vision Commerce		
	proprietary		

Table 8. Correlation of Number of BPI Tools with Results and Technology Applications

	Number of Results	Degree of Results	Technology Applications
BPI General Tools	.715***	.545**	.592***
BPI External Tools	.812***	.733***	.494**
BPI Six Sigma Tools	.691***	.536**	.113
BPI Lean Tools	.710***	.657***	.145
Total BPI Tools	.945***	797***	.394*
Number of Results		.898***	.437**
Degree of Results			.407*

Each correlation coefficient, on a -1(most negative) to 0(none) to 1(most positive) scale, is the degree of association between each BPI tool type and each results/technology; the significance of the coefficient is either * $p < .05$(low), ** $p < .01$(higher), or *** $p < .001$(highest significance)

STUDY METHODS

The researcher conducted a telephone interview of an executive at each of 30 firms in the U.S. financing services industry. Financing executives were identified and recruited with the assistance of Equipment Leasing and Finance Foundation. The structured telephone interview method was chosen to yield richness of information for these issues. There were interviews for nine banks, five captive firms, eight independent companies, and eight multi-line firms. The interviews were conducted from mid-March to mid-May in 2011. Each interview took 15 to 45 minutes. As an incentive to participate, all respondents received a complimentary copy of this report. All executives requested to remain anonymous. All interviews followed the order of the questions of our interview protocol, which is presented in the Appendix.

Measures

This interview study includes four types of independent variables (1. BPI general management tools, 2. BPI customer, supplier, and competitive quality tools, 3. BPI Six Sigma quality tools, and 4. BPI lean management tools), four moderator variables (company type, firm size, market, and technology), and five dependent effectiveness variables (quality improvement, customer satisfaction increase, cost savings, reduced frequency of errors, and reduced severity of errors). After all of the interviews were conducted, the description of each item about the degree of adoption of the BPI tools and the degree of realizing results were evaluated by two raters on a 0-to-5 Likert scale (with 0 as “no extent” through 5 as “very high extent”). The reviewers’ ratings were highly consistent so they were averaged. As a consequence, the interview information could be analyzed in terms of the average degree of implementation and degree of results for each BPI tool, as well as the number of firms or items for the adoption of each BPI tool.

About the Researcher

Charles R. Gowen III is a Professor of Management in the College of Business at Northern Illinois University in DeKalb, arriving there in 1987. He has worked in operations management at Eastman Kodak Company and in commercial credit at Bank One (now JPMorgan Chase), as well as consulted in quality management for several Fortune 100 companies. His current research interests are in financial services, quality, healthcare, and strategic management. He has published in several leading journals, such as recently in the *Journal of Equipment Lease Financing, Quality Management Journal, International Journal of Production Research, Journal of Operations Management, Health Care Management Review, Journal of High Technology Management Research, and Six Sigma Forum Magazine*, and presented papers at numerous national and international conferences. He earned a BS at The University of Rochester (NY) and an MBA and PhD at The Ohio State University (Columbus).

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APPENDIX: INTERVIEW PROTOCOL

A. BPI practices: Which of the following tools has your unit or organization implemented and to what extent?

General BPI management tools:

1. PDCA/PDSA (Plan, Do, Check/Study, and Act) method
2. Process improvement teams of employees
3. Employee recognition, rewards, and promotion opportunity for BPI program success
4. Failure Modes and Effects Analysis (FMEA)
5. Andon (visual signals to indicate a quality/process problem to management)
6. Poka-Yoke (Fail Safing or Mistake-Proofing)
7. Design Of Experiments (DOE)

Customer, supplier, and competitive BPI tools:

8. Customer satisfaction measures (e.g., Voice Of the Customer) by surveys, focus groups
9. Critical-To-Quality (CTQ) metrics (e.g., prioritizing customer satisfaction metrics)
10. Quality Function Deployment (House of Quality) methods
11. Supplier Quality Evaluation (SQE)
12. Competitive benchmarking of best-in-class processes

Process improvement Six Sigma tools:

13. Statistical Quality/Process Control (Control chart, Pareto chart, Fishbone diagram…)
14. DMAIC (Define, Measure, Analyze, Improve, and Control) process
15. Green Belt or Black Belt training for Six Sigma change agents
16. Project reviews and project closure

Process improvement lean management tools:

17. '5S' principles: Sort, Set in Order (Straighten), Shine, Standardize, and Sustain
18. Process mapping
19. Value Stream Mapping (VSM)
20. Kaizen or Kaizen Blitzes (continuous improvement events)
21. Redesign for one-piece flow (Cell design, pull system, etc.)
22. SIPOC (Suppliers, Inputs, Processes, Outputs, and Customers) method
23. Just-In-Time (JIT) process management

B. BPI Program Results: To what extent have quantitative results been realized and about how much of each?

1. Quality improvement
2. Customer satisfaction increase
3. Net cost savings
4. Reduced frequency of errors
5. Reduction in the severity of errors

C. What specific technologies have you used as a means to deploy BPI tools?

1. Work flow tools
2. Leasing platforms
3. Business rules engines
4. Minitab, SASS, SPSS, etc.

D. What are your lessons learned, e.g., did you use the right BPI tools (if not, what would have been better), would you use the same mix of BPI tools in the future (if not, what would you use), etc.?

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