The Usage and Effect of Benchmarking on Supply Management Performance Improvement

By

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Abstract

The findings identify suggestions for utilization of benchmarking as a significant resource for improving supply chain performance and via extrapolation competitive advantage. The research identifies the basic process for benchmarking in regard to supply chain performance, and then examines the literature for examples of usage of benchmarking techniques for improvements to supply chain performance. The research also employed surveys of supply chain professionals to determine the current extent of use, type(s) of benchmarking targets employed and effectiveness of benchmarking efforts.
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Introduction

Supply managers operate within a competitive, dynamic business and technological environment. The competitiveness and dynamism result in constant pressure to improve the effectiveness and efficiency of supply chain (SC) processes and operations. These efforts to improve often result in the organizations utilization of its internally developed and implemented best practices, but significant improvement by continued assessment then becomes more unlikely. More significant improvements to overall SC performance often result from analysis of performance information from outside of the individual SC member’s immediate organization.

An approach to obtaining ideas and information for process improvement is benchmarking (BM). Benchmarking is defined as “an improvement process in which an organization measures its strategies, operations, or internal process performance against that of best-in-class organizations within or outside its industry, determines how these organizations achieved their performance levels, and uses that information to improve its own performance.” (Sower, Duffy, & Kohers, 2008, 4). Benchmarking was formalized as an improvement tool almost 30 years ago when it was introduced to Xerox’s logistics operations in 1981 (Camp, 1980; Flower, J. 1993), and has since been accepted across industries and organizations.

A 2003 survey of supply management professionals in South Africa found that more than 50% of respondents listed benchmarking their SC against best practices as the number one activity in
which they planned to engage to improve SC performance (Barlow World Logistics, 2004). The respondents listed SC partners as their number one source of best practices and new ideas.

This paper outlines the basic process for benchmarking, examines the literature for examples of the use of BM to improve SC performance, and surveys SC professionals to determine the current extent of use, types of BM targets and the effectiveness of BM efforts. Based upon the findings of the literature and survey research, suggestions are made for utilizing BM as a significant resource for improving SC performance.

**The Basic Benchmarking Process**

Supply chains are dynamic systems in ever changing environments and as a result are in constant change (Li and Dai, 2009). Johnson (2009) identified that benchmarking for supply chain management yields lower cost, higher quality and greater customer service. Standards for benchmarking systems used for supply chain operations are being established (Dibenedetto, 2007). The establishment of standards for benchmarking in supply chain operations emphasizes the importance of utilizing benchmarking at the supply chain level.

Andersen and Petersen (1996) find that in actuality there are three types of benchmarking: 1) performance benchmarking; 2) process benchmarking; and 3) strategic benchmarking. These authors define performance benchmarking as a “comparison of performance measures.” (Andersen and Petersen, 1996; p. 14) In addition, these authors identify the purpose of performance benchmarking as identifying areas in need of improvement, identifying processes in
need of improvement and setting realistic targets. Process benchmarking is defined by Andersen and Petersen (1996, p. 14) as a "comparison of methods and practices for performing business." The authors identify that process benchmarking is usually accomplished in tandem with performance benchmarking. Strategic benchmarking as defined by Andersen and Petersen (1996, p.14) is a "comparison of strategic choices and dispositions made by other companies." According to these researchers this type of benchmarking is rarely used.

Boxwell (1994) identified three common criticisms of benchmarking: 1) spying; 2) copycatting; and 3) not invented here. These criticisms result in several misconceptions about benchmarking. One misconception is that BM involves comparing key outcome measures against some standard such as industry averages. This is more like a scoreboard and provides little information to guide the improvement process (Sower, 2007). Another misconception is that BM is somewhat like corporate espionage and is unethical. This is far from the truth. BM involves willing partners, and the American Society for Quality has published a benchmarking code of conduct to govern the BM process (Okes & Westcott, 2001). Benchmarking involves systematic comparison of strategies, operations, or internal processes against best-in-class BM targets. These targets may be internal (another division), within the same industry (competitors), or outside the industry, but all require the free exchange of information.

Further, best-in-class BM performance is often found in entirely different industries. An early example of this is the selection by Xerox of L.L. Bean as a best-in-class benchmarking target for order picking. In its earliest benchmarking projects, 80 percent of Xerox's BM targets were competitors. Within a few years, 80 percent of its BM targets were from outside its industry
(Camp, 1993). Darlington (1999) argued that since laboratories produce an information product, industrial analytical laboratory operations can benefit from benchmarking factory operations. More recently, a number of hospitals have benchmarked to great effect against targets in such diverse industries as aviation, auto racing, entertainment and amusement (Sower, et al., 2008).

While there are several approaches to the benchmarking process (e.g. Camp, 1995; Keley, Ashton & Bornstein), these have evolved into a six-phase basic BM process (Sower, et al., 2008). These steps are 1) Planning; 2) Data Acquisition; 3) Analysis; 4) Integration; 5) Action and 6) Maturity. Planning involves deciding what and whom to BM, determining the BM team, establishing a baseline for existing processes, and defining the objectives and criteria for success of the BM project. Data acquisition may use questionnaires, workshops, conferences, site visits and published documentation to collect data from the BM target. Analysis involves doing a gap analysis between baseline and BM to identify performance gaps and projecting potential future performance levels. Integration involves communicating BM findings, gaining acceptance, and establishing performance goals. Action involves developing an implementation strategy and action plans, implementation and monitoring of progress, and recalibration of the BM. In the maturity phase a determination is made as to when best-in-class performance is attained and objectives for continuing improvement are established.

**Examples of Supply Chain Benchmarking**

Compaq launched an internal supply chain benchmarking program in 2000 which resulted in “substantial savings in cost, cycle time, inventory, and working capital” (Francis, 2008, p. 22).
The author cautions that there are significant challenges most companies face when benchmarking operational performance across the organization and against external entities. Benchmarking can often be more complex, time consuming and expensive than expected. Compaq's first benchmarking effort took over four months and $350,000 in consultant fees. Compaq was satisfied with the $100 million in profit improvement, but dissatisfied with the process. The author concludes that among the recurring challenges of benchmarking (BM) are the need for a high level sponsor, properly defining the scope of the BM, process and metric selection, establishing standard definitions, identifying sources of data, establishing a realistic budget (BM can be expensive), setting realistic time expectations (BM can take from 3-5 months), and assuring that the results obtained are meaningful.

Rynja & Moy (2006) extended the boundaries of their laboratory product model (Rynja & Moy, 2002) to the laboratory product supply chain framework. They (2006, p. 329) report that laboratory service companies “found external benchmarking provided increased product/service quality and reduced costs.”

The CEO of a grocery products manufacturer led their organization through an extensive analysis and benchmarking effort (Slone, Mentzer and Dittmann (2007). The CEO met with key suppliers and retailers in the organizations supply chain and identified best practices. As a result of the organization’s benchmarking effort approximately $3.75 million per year was saved.
The apparel industry promotes the use of benchmarking in supply chains especially in terms of communication. Through the use of benchmarking industry organizations have identified better risk mitigation and increased service levels as realized and potential benefits (Sauls, 2007)

Survey of Supply Chain Professionals

The main purpose of this research is to determine the role that benchmarking plays in activities undertaken to improve supply chain performance. Specifically, this research surveyed SC professionals to determine the current extent of use, types of BM targets and the effectiveness of BM efforts in improving SC performance. The respondents were divided into three categories: large, medium, and small companies. The companies with $50,000,000 and above revenue are defined as large companies. The medium size companies have the revenue between $500,000 and $50,000,000. The small companies are those with under $500,000 revenue. Further, the use of BM in functional areas, the benefits and barriers of implementing BM in all three types companies, and the difference between different group of companies are investigated.

Methodology

Information was gathered utilizing a web-based survey instrument. Benchmarking was defined at the beginning of the survey so that all respondents would interpret this term in the same way. The survey was designed to use the question “Are you involved in improvement of supply chain activities in your organization?” as an initial screen. 216 of approximately 1000 potential respondents passed this screen by replying “yes.” Of these, 196 usable responses were obtained.
All of the respondents worked for organizations in the United States, and 52 (26.5%) of the organizations were divisions of larger companies.

Sixty-one (31.1%) of the respondents were among the top managers (CEO, COO, President, Owner, VP) of their organizations. Forty-five (23.0%) were top managers in the operations, procurement, and supply chain areas. Sixty-six (33.7%) held management.director-level positions in other parts of the organization (e.g. quality control, finance, IT). Twenty-two (11.2%) of the respondents held professional positions within their organizations (e.g. engineer, project coordinator, supervisor, scientist). One (0.50%) respondent did not list a job title.

Forty-seven (24.0%) of the respondents, were in manufacturing industries, twenty-two (11.2%) were in transportation/logistics, eleven (5.6%) were in healthcare, nineteen (9.7%) were in the construction/engineering/technical industries, and eleven (5.6%) were in the government/non-profit/education sectors. The remaining 86 respondents were in various service industries or did not list an industry.

Forty-seven (24%) of the organizations represented large businesses with annual revenues exceeding $50 million, while forty-one (20.9%) represented small businesses with annual revenues below $500,000. The remaining 108 (55.1%) organizations were moderate-sized with annual revenues between $500,000 and $50 million.
Descriptive analysis and findings

Of the 196 respondents, 153 (78%) reported that their organizations have engaged in supply chain improvement activities. The most frequently used criteria for selecting benchmarking targets are convenience (71) or recognized best-in-class organization (69).

Respondents reported that internal targets were the most frequently used in their organizations followed by supply chain partners (Figure 1). Further, supply chain and organizations in the same industry are also frequently utilized as BM targets. However, organizations in different industries are not frequently seen as BM targets (Figure 1).

Operations and internal processes are reported as the most frequently benchmarked. Strategies and outcomes are less frequently benchmarked (Figure 2)
BM targets are examined in Table 1 indicating the differences in benchmarking targets among large, medium, and small companies. Using BM targets for internal processes is more frequently utilized in medium size businesses while large firms focus on benchmarking operations and small firms seems to indicate that there are other areas for their BM focus. For example, 17 out of 52 (32.7%) large companies choose strategy as a use of benchmarking. This utilization rate is 33.6% for medium companies while it is only 14.9% for small companies. Similar results are shown in Table 1 for operation, internal processes, and outcomes.

--------------------------------------------------
Insert Table 1 about here
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The most frequently reported benefits of benchmarking are quality improvement; sourcing/procurement cost reduction; unit cost reduction; improved customer service; lead time reduction; revenue enhancement; inventory reduction; improved supply chain communication and coordination, and reduced warehouse and distribution costs. Figure 3 indicates the reported organizational benefits resulting from benchmarking activities.

--------------------------------------------------
Insert Figure 3 about here
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Benefits reported by large, medium, and small companies are displayed in Table 2. Overall, large companies report more benefits in most categories ranging from 15.4% to 38.5%. While medium
companies report benefits ranging from 9.5% to 33.6%. Small companies seem to recognize far fewer benefits than large and medium companies in all categories.

Benchmarking is not without its difficulties. Respondents cited internal political resistance, too time intensive, lack of BM expertise, and ineffective leadership among the difficulties encountered in their benchmarking efforts. Figure 4 shows all of the difficulties reportedly encountered during benchmarking.

A summary of difficulties each group (large, medium, and small) companies encountered in practice is displayed in Table 3. A greater portion of large companies reported difficulties than medium and small companies. For example, the biggest difficulty reported by all companies is Internal Political Resistance to BM. 32.7% of large companies reports this issue, while only 27.6% of medium companies and 4.3% of small companies report the same issue. The same results can be found in Table 3 for all types difficulties.
Recommendations and Conclusions

The respondents reported that they most frequently selected best-in-class organizations as benchmark targets. This is consistent with the recommendation in most benchmarking literature (Sower, et al., 2007; Camp, 1989, 1993). However, the second most frequent criterion for selecting benchmark targets is convenience. While this reduces the cost and effort involved, it is unlikely to produce the same quality of results as using a best-in-class target (Sower, 2007, 60). The results of benchmarking against a convenient target that is not best-in-class may just result in another sub-optimal approach rather than substantive improvement.

The most frequent benchmark target is an internal one followed by a supply chain partner. It is a good practice to assess whether other division within the organization or SC partners have achieved best-in-class status in the area where benchmarking is being considered. Benchmarking projects utilizing internal or partner organizations as targets, can generally be completed in less time and with fewer resources. The use of internal targets also offers the prospect of easier leadership buy-in, fewer political obstacles, and fewer adaptations required in order to implement the findings. The fact that fewer than 30% of respondents benchmarked against targets outside their industries indicates that opportunities exist for increasing the effectiveness of BM activities by expanding the scope of possible BM targets.

That operations, internal processes, and strategies are more frequently benchmarked than outcomes is consistent with best practices (Sower, 2007). Outcome benchmarking is required in some industries (e.g. healthcare, education) and can be useful in providing information to
external constituents. It can also be useful in identifying areas most in need of improvement, however it offers no insight into what processes result in best-in-class performance. Outcome benchmarking serves more as a scorecard than the basis of a plan for improvement. It is the benchmarking of the operations, internal processes, and strategies that result in best-in-class performance that can be most useful to organizations aspiring to become best-in-class.

Respondents reported their benchmarking activities have achieved significant improvement in core areas affecting supply chain performance. Most frequently cited were improvements in quality, reductions in both procurement and unit costs, improved customer service, reduced lead times, enhanced revenues, inventory reductions, improved supply chain communication and coordination, and reduced warehouse/distribution costs. These claimed improvements are a testament to the value of benchmarking in improving supply chain effectiveness and efficiency.

However, benchmarking projects are not without their difficulties. Respondents cited internal political resistance, time demands, lack of BM expertise, ineffective leadership, the ‘not invented here’ syndrome, lack of necessary resources, cost, the feeling that BM is somehow equivalent to industrial spying, and inability to adapt BM findings to the organization. The difficulties relating to resource constraints and leadership problems are common to all improvement efforts—not just benchmarking. It is no accident that most improvement programs such as TQM, Six Sigma, and Lean start by stressing the importance of leadership involvement and commitment. Gaining support from organizational leadership and overcoming political difficulties can best be addressed by educating the organization on what BM is and why it is a good tool for use in the current situation. This, followed by a good plan for conducting the BM based on Camp’s (1995)
5-phase approach, QAP’s 7-phase approach (Keley, et al., 2006), or Sower, et al.’s (2008) 6-phase approach, may help with skepticism and reluctance to participate.

The size of the company seems to effect BM targets, realized benefits, and difficulty in implementation. For example, small companies are not as active as larger size companies in BM implementation. First, they may not fully understand BM because of the lack of expertise and resources. Second, small companies may not realize all potential benefits of adopting BM. Finally, basic training or education on benchmarking maybe not available or provided in small companies.

Lack of BM expertise is more easily correctable. Equating of BM to spying reflects a lack of understanding of the tool. Following the Quality Management Division of the American Society for Quality’s “The Benchmarking Code of Conduct” (Oakes & Westcott, 2001) can help assure that BM efforts meet the highest ethical standards.

The inability to adapt BM findings to the organization is a real difficulty that must be overcome in order for BM to be beneficial. Each organization operates within its own distinct external and internal environments. What works well in one organization is unlikely to work as well in another. Rather it must be adapted to suit the particular internal and external organizational environments in order to provide meaningful improvement. Sower, et al. (2008) recommend a S3² framework to assist in adapting BM findings to the organizational environments. Simply copying what another organization does is unlikely to achieve the desired results.
The empirical conclusions achieved through means of unbiased survey and analysis of responses demonstrates that benchmarking in relation to achieving best practice and competitive advantage already exists within Supply Chain organizations. Conclusions also demonstrate that numerous issues and difficulties exist in the utilization of benchmarking technique(s) by organizations and their subsequent members because of lack of knowledge and training coupled with a lack of organizational support.
References


Survey Instrument

Benchmarking is defined as an improvement process in which an organization measures its strategies, operations, or internal process performance against that of best-in-class organizations within or outside its industry, determines how these organizations achieved their performance levels, and uses that information to improve its own performance. It is a tool that is often used to improve supply chain effectiveness and efficiency. This survey seeks information on the use of BM in your organization to improve SM performance.

Respondent information

What is your job title? ________________________________

Has your organization engaged in SC improvement activities?
   ___ Yes   ___ No

Are you involved in improvement of SC activities in your organization?
   ___ Yes   ___ No  (If no, go to End)

Section A

Industry/Organization
In answering these questions, industry/organization refers to the business unit for which you engage in SC activities. It may be the entire organization or a division of a larger organization.

In what industry do you work (NAICS/SIC)? ________________________________

Is your organization located in the United States?
   ___ Yes   ___ No

Is this organization a division of a larger company?
   ___ Yes   ___ No

What is the size of your organization in terms of:
   Annual revenue? $ ______________ USD
   Number of employees? _______________________

Use

Has your organization utilized BM in efforts to improve its SC performance?
   ___ Yes   ___ No  (If no, go to Section C)

Which type of BM targets is used by your organization (check all that apply)?
   ___ Internal (e.g. other divisions of the same organization)
   ___ Supply chain partners
___ Organizations outside your SC but in the same industry
___ Organizations outside your SC and in a different industry
___ Other Specify: ____________________________

How does your organization select BM targets?
___ Convenience
___ Non-competitor
___ Recognized as best-in-class
___ Other Specify: ____________________________

Which of the following has your organization BM (select all that apply)?
___ Strategies
___ Operations
___ Internal processes
___ Outcomes
___ Other Specify: ____________________________

Results

How has your organization’s SC performance benefitted from BM? Check all that apply.
___ Lower sourcing/procurement costs
___ Lower unit costs
___ Revenue enhancements
___ Improved customer service
___ Lead time reduction
___ Quality improvement
___ Technological advance
___ Reduced investment in inventory
___ Lower warehouse/distribution costs
___ Stock out reduction
___ Making the SC more environmentally friendly
___ Improved SC coordination/communication
___ Other Specify: ____________________________

Please describe any difficulties your organization has encountered in its BM efforts. Check all that apply.
___ Internal political resistance to BM findings
___ Reluctance to engage in BM because it is viewed as a form of spying
___ A feeling that what works elsewhere will not work here
___ Too expensive
___ Too time intensive
___ Lack of knowledge or expertise in BM
___ Inability to adapt BM findings to our organization’s environment
___ Ineffective organizational leadership
___ Lack of resources
___ Other Specify: ____________________________
Section C
Have you heard of benchmarking?
   ____ Yes    ____ No    (If No, go to End)

Has your organization considered BM?
   ____ Yes    ____ No

Why has your organization not engaged in BM activities? Check all that apply.
   ____ Too expensive
   ____ Too time intensive
   ____ Lack of knowledge or expertise in BM
   ____ Unaware of the benefits of BM
   ____ Other    Specify: ________________________________

Is BM a part of the future plans of your organization.
   ____ Yes    ____ No

End

Thank you for completing this survey.
Figure 1. Reported Benchmark Targets Utilized

![Bar chart showing frequency of use for different benchmark targets: Internal, SC Partner, Same Ind., Dif. Ind., Other.](chart.png)
Figure 2. Reported Type of Benchmarking Activities

![Bar chart showing the frequency of use for different types of benchmarking activities: Operations, Internal Processes, Strategies, Outcomes, Other.]
Figure 3. Organizational Benefits from Benchmarking

Improvement Category

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Imp.</td>
<td></td>
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<tr>
<td>Sourcing</td>
<td></td>
</tr>
<tr>
<td>Cost Red.</td>
<td></td>
</tr>
<tr>
<td>Unit Cost Red.</td>
<td></td>
</tr>
<tr>
<td>Cost Svc.</td>
<td></td>
</tr>
<tr>
<td>Inv. Svc.</td>
<td></td>
</tr>
<tr>
<td>IT Red.</td>
<td></td>
</tr>
<tr>
<td>Revenue Enhance</td>
<td></td>
</tr>
<tr>
<td>Inv. Red.</td>
<td></td>
</tr>
<tr>
<td>Inv. Comm./Coord.</td>
<td></td>
</tr>
<tr>
<td>Env. Friendly</td>
<td></td>
</tr>
<tr>
<td>SO Red.</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
Figure 4. Difficulties with Benchmarking
Table 1: Benchmarking targets

<table>
<thead>
<tr>
<th>Company Size</th>
<th>Strategies</th>
<th>Operations</th>
<th>Internal Processes</th>
<th>Outcomes</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>17 (32.7%)</td>
<td>33 (63.5%)</td>
<td>31 (59.6%)</td>
<td>18 (34.6%)</td>
<td>5 (9.6%)</td>
</tr>
<tr>
<td>Medium</td>
<td>39 (33.6%)</td>
<td>74 (63.8%)</td>
<td>65 (56.0%)</td>
<td>31 (26.7%)</td>
<td>12 (10.3%)</td>
</tr>
<tr>
<td>Small</td>
<td>7 (14.9%)</td>
<td>17 (36.2%)</td>
<td>10 (21.3%)</td>
<td>8 (17.0%)</td>
<td>19 (40.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>63 (29.3%)</td>
<td>124 (57.7%)</td>
<td>106 (49.3%)</td>
<td>57 (26.5%)</td>
<td>17 (7.9%)</td>
</tr>
</tbody>
</table>

Small: revenue under $500,000

Medium: revenue between $500,000 and $50,000,000

Large: revenue over $50,000,000
Table 2: Benchmarking benefits:

<table>
<thead>
<tr>
<th>Company Size</th>
<th>LPC (p)</th>
<th>QI (p)</th>
<th>ICS (p)</th>
<th>LUC (p)</th>
<th>RE (p)</th>
<th>LTR (p)</th>
<th>RI (p)</th>
<th>LWC (p)</th>
<th>ISCC (p)</th>
<th>TA (p)</th>
<th>EF (p)</th>
<th>STR (p)</th>
<th>Other (p)</th>
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</thead>
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<tr>
<td>Large</td>
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<td>17</td>
<td>19</td>
<td>15</td>
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<td>(38.5%)</td>
<td>(32.7%)</td>
<td>(36.5%)</td>
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<td>(19.2%)</td>
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<td>(31.9%)</td>
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<td>(24.1%)</td>
<td>(24.1%)</td>
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<td>(4.3%)</td>
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<tr>
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<td>53</td>
<td>45</td>
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<td>(28.4%)</td>
<td>(28.4%)</td>
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<td>(20.9%)</td>
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<td>(18.1%)</td>
<td>(12.1%)</td>
<td>(10.7%)</td>
<td>(9.8%)</td>
<td>(1.4%)</td>
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</table>

LPC: Lower sourcing/Procurement Costs; LUC: Lower Unit Costs; RE: Revenue Enhancements; ICS: Improvement Customer Service; LTR: Lead Time Reduction; QI: Quality Improvement; TA: Technological Advance; RI: Reduced Investment in Inventory; LWC: Lower Warehouse/distribution Costs; STR: Stock-out Reduction; EF: making the supply chain more Environmentally Friendly; ISCC: Improved Supply Chain Coordination/Communication.
Table 3: Difficulties for implementing benchmarking

<table>
<thead>
<tr>
<th>Company</th>
<th>IPR</th>
<th>TTI</th>
<th>LKE</th>
<th>IOL</th>
<th>NW</th>
<th>LR</th>
<th>TOE</th>
<th>RTE</th>
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<tbody>
<tr>
<td><strong>Size</strong></td>
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<td>(17.3%)</td>
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<td>(11.5%)</td>
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<td>(27.6%)</td>
<td>(23.3%)</td>
<td>(17.2%)</td>
<td>(18.1%)</td>
<td>(15.5%)</td>
<td>(12.9%)</td>
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<td>(18.1%)</td>
<td>(16.3%)</td>
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<td>(14.4%)</td>
<td>(12.6%)</td>
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<td>(8.8%)</td>
<td>(8.4%)</td>
</tr>
</tbody>
</table>

IPR: Internal Political Resistance to BM findings  
RTE: Reluctance to Engage in BM because it is viewed as a form of spying  
NW: a feeling that what works elsewhere will not work here  
TOE: Too Expensive  
TTI: Too Time Intensive  
LKE: Lack of Knowledge or Experience in BM  
IA: Inability to adapt BM findings to our organization’s environment  
IOL: Ineffective organizational Leadership  
LR: Lack of Resources.