

APPALACHIAN BUSINESS OWNERS: PERCEPTIONS OF THEIR OPERATIONS SYSTEM AND METHODS FOR PROBLEM RESOLUTION

Shakil Rahman, Frostburg State University
srahman@frostburg.edu

Michael Monahan, Frostburg State University
mmonahan@frostburg.edu

ABSTRACT

Operational improvement can be defined as an investment in technology, processes or procedures for growth, customer service, or efficiency. This paper explores the perceptions of 309 business owners in Appalachia about the operation systems of their firms and the percent of revenue spent on operational improvements. The majority, 41% spent between 1-5% of revenue followed by 27% who spent 6-10%. In addition, 69% of owners stated operational problems were resolved collaboratively by the employee and the supervisor? Finally, the researchers sought to establish if the operational issues varied by the owners' gender, type of business or sales volume. However, none of these variables revealed statistically significant differences in how operation issues were resolved.

INTRODUCTION

The Appalachian Region is a historically underdeveloped and economically disadvantaged area encompassing 205,000 square miles. Cradled by the Appalachian Mountains, it stretches from northern Mississippi to southern New York. In 1965, to address unemployment and poverty issues in this geographically-isolated region, the Appalachian Regional Commission was created (see www.arc.gov/appalachian_region/theappalachianregion.asp). The economy until the mid-1960s was dominated by mining, forestry, and heavy industry. Between 2000 and 2009, in fact, two-thirds of Appalachian counties had unemployment rates higher than the national average and per capita personal income and average earnings were nearly 20% lower than the nation as a whole. During this period the population growth was 5.7% as compared to 9.1% for the nation resulting from outmigration (see www.arc.gov/images/appregion/Jan2011/EconomicOverview).

The world, according to Thomas Friedman, is becoming flat (Freidman, 2005). Technology, communication and transportation improvements are enabling geographic isolated regions to prosper. Well-organized operational systems are vital for any business to succeed. Perhaps, through the use of better operations management, Appalachian firms could better compete in this new marketplace.

Operations Management refers to the set of activities that creates value in the form of goods and services by transforming inputs into outputs (Heizer & Render, 2010). Many times the operational functions of a business are ignored as these systems work behind the scenes and aren't a noticeable part of most organizations. Operations are rarely given a thought, expected to work and are analogous to electricity and telephone services that always work. No one is concerned about operations until something goes wrong. However, these functions are central for any business to run properly.

Operations often consist of hidden components which generally control a large share of the firms' resources. Their efficiency, process-flow, effectiveness, and timeliness are critical for firms to be competitive. Many firms have renewed their focus on cost-cutting, efficiency, and profitability in order to weather the storms of turbulent economic times. Understanding these factors could enable businesses to emerge better prepared for growth. For example, in addition to low prices, Wal-Mart has a superior supply chain and distribution system. This is reflected in Wal-Mart's direct reordering at the point of sale, efficient delivery, and inventory replenishment (Trunick, 2003). Southwest Airlines ensures its maintenance and operating efficiency by only using one type of aircraft. This means more proficient mechanics, interchangeable spare parts and any pilot can fly any plane (see www.southwest.com). In addition, by utilizing an interactive ordering system to prepare custom-made items, regional firms, such as the convenience store Sheetz, which specializes in gasoline at the lowest price and made-to-order sandwiches (<http://www.sheetz.com/main/about/gasoline.cfm>), are able to become more efficient and attract more customers. The concept of "best practices" provides similar businesses with ideas for improving efficiency. Egerton-Thomas (2005) provided advice to new entrepreneurs in the restaurant business on methods for improving operations. Likewise, Saunders et. al. (2008) studied operation management practices and selected the top fifty practices which could improve organizational performance.

Purpose

The purpose of this study is to investigate Appalachian business owners' perceptions of their operating system and their propensity to invest funds for improvement. In addition, this study seeks to determine which method: autocratic, shared, delegated or the use of consultants is predominantly utilized.

LITRATURE REVIEW

Minimal research directly related to Appalachia operations was found; however, literature in general concerning business owners' perception and problem solving was reviewed.

Perception

The owners' perception of their operating system is highly subjective and is often biased as their personal views have a profound impact on the business. In fact, Meziar and Starbuck (2003) contended owners generally have inaccurate and wildly-distorted perceptions of their businesses and markets. Nonetheless, the owners' willingness to obtain feedback and respond accordingly is an important moderating factor. Similarly, Walton and Dawson, (2001) found owners who incorporate their views into models of organizational effectiveness are more likely to improve effectiveness. A survey of 176 e-commerce firms by Schniederjans and Cao (2009) noted the alignment of operations strategy by general and operations managers is influenced by organizational variables such as years in operation and length of time the various managers worked together.

With the never-ending demands on time and resources, owners are often preoccupied and may not have the wherewithal to seek improvements if operations are functioning at an acceptable level. However, as time progress, myriad changes may have significant impact on the business. Godin (2003) warned however, that fixing a problem does not always correct the policy or situation that created the problem in the first place. Since operations often comprise a significant share of firms' expenses, cutting those expenses can lead to increased productivity. In addition, Spence (2009) suggested companies should focus on cost control to improve their profit margins. On the other hand, Whicker et. al. (2009) asserted that since the true cost of operations is unclear, perhaps metrics are needed to increase supply chain performance.

Achieving operative excellence is critical for every business. Schwientek and Schmidt (2008) claim operational improvements are the Holy Grail that leads to increased value over the long term. Furthermore, Johnson and Clark (2005) and Lashar (2008) contended that improving resource management can better deliver services to their customers. In fact, many of these improvements have come about through the use of technological solutions.

Consultants

When specific expertise is needed, consultants may be the solution as they can often bring experience and specialized skills to address operational problems. Kihn (2005) asserted consultants can add significant value and generally outperform in-house personnel. Carter (2001) cites the importance of consultants in dealing with the myriad of issues which affect the coal industry. Billington and Davidson (2010) emphasized how networking web sites, such as LinkedIn and Facebook, enable firms to access outside experts who have already addressed particular problems.

The use of consultants has a mixed history of successes and failures. Cassidy and Buede (2009) illustrated for decision-makers the danger of accepting expert advice without skepticism. Similarly, Kihn presented scathing practices conducted by some consultants. Hoffman (2004) noted Information Technology owners who hire consultants often end up getting less out of the technology product and outsourcing contracts than they had hoped for, due to poorly defined scope of work contracts. In a modern day parable, however, it is suggested that, although some consultants give bad advice, it doesn't prove they can't give good advice (The Tale of Mr. Jackson, 2010).

Certainly, it is not fair to paint all consultants with the same brush, as there are strong cases for the use of consultants. Consultants play a role in measuring the workload and productivity in hospitals (Rough et. al. 2010). Likewise, Garside (1999) found many manufacturing firms failed to invest adequate resources in designing factory operations due to their lack of expertise. In addition, Clarke (2007) cited ways for firms to make sure they are getting value for the fees paid to their consultants, as well as assistance in dealing with suppliers to gain the most benefit. (2009, Can You Trust Your Consultants and Service Providers)

Biech (2007) provided an in-depth analysis of the trials and tribulations of becoming a consultant by including advice on how to provide more value to the client, discussing managing customers, and actions which often lead to becoming a bad consultant. Further, Drain (2003) asserted the value in enlisting the services of a professional food consultant. Equally, cosmetic firms can benefit from hiring Information Technology consultants to improve marketing and management (Hiring an IT Consultant, 2009). Even if the consultant hired is honorable, the expectations of the owner should be reasonable. Soloman (1997), noted a survey of 26 firms which spent 2% of their net revenues on a consultant and saw the result of consultant use to their firm's stock price which was increased by 4 points. This assumed correlation is unrealistic for owners to expect as the results may have been due to other factors although it points to the value added by consultants.

Consultants may also assist in applying proven methods across industries. For example, Rutlege (2010) found the Toyota Production System for lean processing was used to improve quality and also reduce cost in a hospital laboratory environment. Similarly, Perry (2006) encouraged firms to take advantage of the third-party logistics service providers in order to control operations and costs. But before consultants can provide recommendations, however, their integrity needs to be examined by prospective customers. Kautonen et. al. (2010) studied 153 young Finnish firms and found the owners' perception of the consultants' integrity was more important than the effectiveness of their recommendations.

Decision Making

Every business confronts immediate and long-term operational problems that range from well-defined to ambiguous. Decision-making is on a continuum ranging from the manager or owner

making the decision alone, to shared input, and finally delegating the decision-making to the employees (Tannenbaum & Schmidt, 1973).

While it is conventional wisdom that those most closely affected (the front-line workers) may have some of the best ideas for improvement, these workers may not feel at ease contributing to the solution, due to limited knowledge or organizational culture. Nevertheless, owners in the last century have traditionally been autocratic and have adopted the “I’m the boss, that’s why” attitude” (Caruso, 2012). The concept of shared decision-making can be unsettling for seasoned, old school owners. However, including the workers in problem solving can yield better results (2002, The tyranny of managers). Replacing autocratic decision making with a more participative model begins with supervisors who do not feel their power, prestige or position are threatened (2002, The Ego has Landed).

Some bosses are autocratic in that they want to make every decision by themselves, but Golden Business Ideas (2002) stressed the importance of the boss stepping back to allow subordinates to come forward to solve the problem. The boss should then intervene only if the employees are having trouble solving a problem on their own. Further, in a study of nearly 7500 healthcare incidents, Adler-Milstein, Singer, and Toffel (2010) found that particular management practices can influence front-line workers' decisions about whether to speak up. Further direct managerial engagement can result in their doing so constructively.

With regard to the management styles, in a study of Midwest community colleges, Thaxter and Graham (1999) found the faculty perceived their institutions operated under autocratic decision making. While this minimizes unknowns, it also leaves faculty out of the process thereby eliminating ideas and innovations brought by faculty members. However, in a study of high school principals in Israel, Bogler (2001) found participative involvement by the faculty was integral to job satisfaction. Similarly, in a study of high school teachers in Oklahoma, moving from autocratic to participative decision-making improved morale and productivity (Muller & Thorn, 2007). Krause (2009) recommended the use of team based projects and Lean Six Sigma to encourage collaboration, increase quality and efficiency while, Carmelli et. al. (2009) contend that participatory decision-making in top management teams improves decision effectiveness and firm performance.

In an evaluation of conflict management systems, Lipsky and Avgar, (2010) cited the progressive and traditional views of conflict. Ultimately, the selection of a conflict management system is dependent on the broader goals and objectives of the organization. Lui and Ke (2007) stressed the importance of problem solving and how this skill can create competitive business advantages. They developed a prototype system to demonstrate the effectiveness of providing situation/action-relevant information and decision-making knowledge to help workers solve problems.

Even ideas which worked in the past are now coming back into vogue. LaLone (2008) contended survival strategies used in the 1930's- diversification, reciprocity, and pooling - are being adapted to run the family farm in the 21st century. While there is much emphasis on youth, Phair (2007) argued that experienced workers (those about 50 years of age) could solve half of firms' problems and alleviate projected labor shortages. Interestingly, problems develop when workers empowered to make decisions sometimes send the problem back to the supervisor rather than solving the problem themselves (Jones, 2000). Further, Tulgan (2007) asserts that the practice of "under management" is one of the biggest problems facing corporate America. Many upper-level owners do not follow the practice of MBWA (management by walking around). He contends supervisors are not doing what they are paid to do and offers suggestions for effective supervision. In short, while there is no one right method for all cases, the research points to employee empowerment and shared decision-making to improve employee efficiency and participation.

METHODS

The researchers developed a survey to ascertain the perceptions of businesses in the targeted Appalachian area. This instrument was mailed to the owners of small businesses to gauge their perceptions of their operating system, and how they solve operational problems. The survey encompassed various business sectors such manufacturing, retail, construction, wholesale, financial services, healthcare, and food services. The type, revenues, and the length of time in operation were compared to discern if any correlations exist. After six weeks, a follow-up survey was mailed to the firms to improve the anonymously response rate. The total number of respondents was 309 (approximately 10%) from five counties in three contiguous states in Appalachia. The researchers utilized SPSS for data management and analysis in an attempt to answer the following research hypotheses:

- H 1: Owners perceive their firms' operating systems are efficient
- H 2: Owners perceive preventive maintenance is critical
- H 3: Owners spend more than 6% of revenue to improve operating systems
- H 4: Owners independently solve operational problems

ANALYSIS OF EMPIREICAL SURVEY

The demographic compositions of the respondents are listed in Table 1. In summary, the majority of respondents was male (70%), over 50 years of age (70%), in retail firms (25%) with revenues over \$1 million (51%), and had been in operation over ten years (89%). Since nearly 90% of firms had been in business over ten years, it can be assumed they are surviving. The ARC 2011 report states between 2000 and 2009, two-thirds of Appalachian counties had unemployment rates higher than the national average and per capita personal income and average earnings were nearly 20% lower than the nation as a whole. Therefore, surviving does not equate to prospering.

TABLE 1. DEMOGRAPHICS

Gender	%	Annual Revenues	%
Female	23.6	< 500K	34.0
Male	69.6	500-1 mil	15.1
Unidentified	6.8	1-3 mil	22.0
Owners' Age	%	3-10 mil	14.8
0-39	8.1	Over 10 mil	14.1
40-49	22.0		
50-59	35.6	Business Classification	%
60-69	18.8	Manufacturing	11.7
Over 70	6.8	Retail	25.2
		Construction	10.0
Length of Time in Operation	%	Wholesale	1.9
1-3 yrs	1.0	Finance	8.7
4-6 yrs	3.6	Healthcare	7.4
7-10 yrs	6.5	Food Services	3.6
Over 10 yrs	88.7	Other	31.4

A Likert scale was used to establish the degree of confidence the owners have in their firms' operating system and data was collected by the gender and age of the owner, the revenues of the firm and the length of time the firm was in operation. Overall, owners overwhelmingly perceived (84%) their firm had an efficient operating system. By gender, this perception was even stronger as 90% of women owners felt their firm's operations were efficient. Regarding age, none of the owners over 70 years old were critical of their operating system; however, nearly one quarter of these owners were unsure of the value of replacing their existing systems or of the cost to replace their existing systems. In reference to the type of business, less than 3% of manufacturing owners strongly approved of their operating system. Conversely, 37% of the owners of financial firms strongly approved of the efficiency of their operating system. Interestingly, by revenue as well, the results were remarkably similar (see Table 2).

TABLE 2. EFFICIENCY OF OPERATIONS BY REVENUES

	Revenue				
	< 500K	500-1 mil	1-3 mil	3-10 mil	>10 mil
Disagree	2.0%	4.6%	3.2%	9.3%	2.4%
Not Sure	10.2%	7.0%	15.8%	9.3%	14.7%
Agree	87.8%	88.4%	81.0%	81.4%	82.9%

No statistically-significant differences were found on the basis of the owner's gender, age, business classification, or length of time in business or annual revenue. The hypothesis H1 was supported, as a strong majority of owners perceived their operating system as efficient.

The survey participants were asked about the importance of preventive investment in the maintenance of their operational systems, even if these systems appeared to be functioning normally. The results were mixed as only 30% agreed on the importance of preventive maintenance, 36% disagreed while 34% were not sure. This infers that these owners are not concerned about their operational system until a problem arises. More specifically, regarding the type of business, owners of Construction firms (42%) did not actively seek improvements if their current system was working. This may indicate the confidence in tried and true methods. Conversely, Manufacturing firms (51%) and Healthcare firms (48%) were willing to seek new efficiencies. This may be due to the competitive and dynamic nature of these businesses.

Overall, smaller firms were less likely to perceive the need for preventive maintenance than larger firms as they may be preoccupied with maintaining the business. However, over half of the larger firms, with sales over \$10 million actively pursued preventive maintenance, though these firms only represented fourteen percent of the respondents' population.

An ANOVA was performed and no statistically-significant differences due to business classification, owners' age, gender, or annual revenues were found. Therefore, hypothesis H2 was disproved, as a minority of owners support preventive maintenance.

The owners were then asked what percentage of revenue was routinely spent to improve business operations. The majority of owners (41%) spent between 1-5% of revenue to improve operations, followed by 27% of owners who spent between 6-10%. Interestingly, less than 1% spent zero on business improvements, while 8% spent over 20% (see Table 3).

Another intriguing finding was that in those firms that spent at least 16% of their revenue on improving business operations, female owners tended to outspend males two to one (see Table 4). Also, as the age of the owners increased, so did the amount of spending on operational improvements. This finding found weak but statistically-significant differences ($r = .153$ $p .007$).

TABLE 3. COMPARISON OF REVENUE BY FIRM SIZE

Firm's Size	Percent of Revenue Spent to Improve Operations					
	Zero	1-5%	6-10%	11-15%	16-20%	> 20%
< 500K	1.1%	35.8%	25.3%	18.9%	9.5%	9.5%
500-1,000K	2.4%	53.7%	14.6%	7.3%	12.2%	9.8%
1-3 million		45.9%	29.5%	13.1%	6.6%	4.9%
3-10 million		43.9%	31.7%	4.9%	17.1%	2.4%
>10 million		30.8%	35.9%	5.1%	12.8%	15.4%
Total	0.7%	41.2%	27.1%	11.9%	10.8%	8.3%

TABLE 4. COMPARISON OF REVENUE BY GENDER

Gender	Percent of Revenue Spent to Improve Operations					
	Zero	1-5%	6-10%	11-15%	16-20%	> 20%
Female	2.8%	40.8%	18.3%	7.0%	14.1%	12.7%
Male	0.5%	39.5%	28.4%	12.1%	8.4%	6.5%
Total	0.7%	41.2%	27.1%	11.9%	10.8%	8.3%

Curiously, the “Other” category was the most apt to invest more than 20% on improvements. Finance and Healthcare led the spending in the 11-15% and 16-20% categories. This may be due to the technological dynamics that define these industries. Conversely, Food Services, Construction and Retail spent only 1-5% of revenues. No statistically-significant differences emerged due to gender, age of the owner, business classification or annual revenue. Hypothesis 3 was confirmed. The majority of the respondents agreed the money spent to improve their operating system was a wise investment (see Table 5). Only 13% did not feel this spending was prudent.

**TABLE 5. SPENDING FUNDS TO IMPROVE
THE OPERATING SYSTEM ADDS VALUE**

Never	Seldom	Occasionally	Usually	Always
0.7	12.4	30.6	36.2	18.6

However, an ANOVA was conducted to compare the manager’s age, business classification and business revenue. The only statistically-significant difference found concerned the firms’ revenues (see Table 6). $F = 8.28$, Performing post-hoc tests, the following differences were revealed (see Table 6):

Owners’ Perceptions	Significance
• Between 500K and 1-3 mil	= .021
• Between 500K and 10 mil	= .000
• Between 500K-1 mil and 10 mil	= .000

TABLE 6. PERCEPTIONS BY ANNUAL REVENUE

	< 500K	500-1 mil	1-3 mil	3-10 mil	>10 mil
Never	2.0%				
Seldom	18.2%	16.3%	7.9%	7.0%	
Occasionally	33.3%	44.2%	27.0%	32.6%	19.5%
Usually	33.3%	27.9%	39.7%	41.9%	39.0%
Always	12.1%	11.6%	23.8%	18.6%	41.5%

In summary, the higher revenue companies believed the money spent was a wise investment. This was much more apparent than for the companies with lower revenues. In the owners’ opinion, does the use of outside consultants improve their operations? Only 17.9% of the respondents to this survey agreed that using outside consultants improved the operational efficiency of the company. Also, the majority (54.4%) did not feel the outside consultants would provide helpful suggestions (see Table 7). An ANOVA was conducted to see if differences appeared between the age of the owners, the type of business, and the firms’ annual revenue. The ANOVA yielded a result of $F = 5.65$ Significance=.001 for the age of the manager. The Tukey post hoc test revealed differences between age groups:

Age groups	Significance
40-49 and 50-59	= .031
50-59 and 60-69	= .011
50-59 and over 70	= .020

TABLE 7. CONSULTANTS IMPROVING OPERATIONS BY AGE

	30-39	40-49	50-59	60-69	>70	Total
Strongly disagree	33.3%	29.4%	16.4%	31.0%	38.1%	24.1%
Disagree	33.3%	29.4%	25.5%	34.5%	42.9%	30.3%
Not sure	8.3%	22.1%	32.7%	22.4%	14.3%	24.1%
Agree	8.3%	8.8%	20.9%	5.2%		12.4%
Strongly agree	12.5%	2.9%	4.5%	3.4%	4.8%	5.5%

There were no statistically-significant differences based on gender, the type of the business or the annual revenues. This finding implies that regardless of the gender of the manager, the category of business or its size, the perception of consultants providing value was minimal.

The researchers sought to determine how operational problems were resolved and who was tasked with making the decisions. While many believe in the traditional autocratic style of management where the boss makes the decisions, this mode is rapidly losing traction for a number of reasons. The majority (nearly 70%) of respondents in this survey indicated both the employee and the supervisor working collaboratively solved the problems following proven methods (see Table 8).

TABLE 8. HOW OPERATIONAL PROBLEMS ARE RESOLVED

	Agree	Disagree
By Employee alone	19.1	50.5
By Employee and Supervisor	69.6	10.9
By Supervisor alone	38.4	25.4

When examining the response by gender, a very slight but statistically significant relationship was found of $r = .151$ $p .012$. While the overall responses were similar, female owners were much more adamant that problems were not solved by the employee alone (see Table 9).

TABLE 9. PROBLEMS SOLVED BY EMPLOYEE ALONE

	Female	Male
Strongly Disagree	42.4%	12.1%
Disagree	12.1%	37.2%
Not Sure	27.3%	31.4%
Agree	16.7%	17.9%
Strongly Agree	1.5%	1.4%

An ANOVA was conducted and revealed $F = 3.281$ Significance = .012 due to the differences between firms with annual revenues of less than \$500,000 and \$10 million was .006 (see Table

10). This shows that smaller firms were much more apt to solve operational problems by the supervisor alone. However, the owners' age, gender, or business type revealed no statistically significant differences.

TABLE 10. PROBLEMS SOLVED BY SUPERVISOR ALONE

	Revenues					Total
	< 500K	500-1,000K	1-3 mil	3-10 mil	>10 mil	
Strongly Disagree	4.1%	9.8%		7.0%	13.2%	5.7%
Disagree	15.5%	7.3%	30.0%	23.3%	31.6%	20.8%
Not Sure	37.1%	43.9%	36.7%	34.9%	36.8%	37.6%
Agree	32.0%	29.3%	30.0%	32.6%	13.2%	28.7%
Strongly Agree	11.3%	9.8%	3.3%	2.3%	5.3%	7.2%

The hypothesis H4 was disproved as the majority of owners and employees worked together. The qualities of trust, training and empowerment are critical components of this participative management style.

CONCLUSION AND IMPLICATIONS

The Appalachian Region has lower income and higher unemployment than other regions in Maryland. Because of this, Appalachian firms are disadvantaged. However, the results of this study show a vastly different reality. The large majority of Appalachian firm owners (84%) understand the importance of having a cost-efficient operating system. Many firm owners (58.1%) understand the need to continually reinvest back into the firm in order to remain competitive, leading to them spending 6% or more of revenue to improve operations. In fact, less than 1% of firm owners spent nothing on business improvements. In addition, when things are running smoothly, these business owners are not all content to sit back. Our study reveals that a large number of firms (30%) continually seek improvements even when their system is functioning properly. Different types of businesses seemed to have different views on seeking out new methods, with Manufacturing firms (51%) and Healthcare firms (48%) being the most active.

Appalachia firm owners generally frown upon the use of consultants (54.4%), as they did not perceive outside consultants have the knowledge or expertise to solve their problems. Only 17.9% of the respondents to this survey felt that outside consultants improved the operational efficiency of the company. Although the traditional, autocratic style of management was expected to be the most popular, our study found that only 38.4% of businesses agreed with this method. Instead, the majority (69.9%) of respondents indicated that the preferred style used to solve problems was for both the employee and the supervisor to work together. Seeing the majority of firms solving problems in a participative way is encouraging for Appalachia's future,

as these owners realize greater employee input can lead to better solutions and greater productivity.

Overall, our researchers expected larger firms to be more proactive in improving their business operations than small firms. However, most owners, regardless of size, understood the importance of having, maintaining, and improving an effective operating system, as indicated in our survey results. While many expect firms in Appalachia to lag behind other Maryland firms in spending money to improve their operations, the data shows something quite different. Nearly universally, Appalachian firms do spend money on operational improvements. In fact, the spending of these firms is very efficient and capable. Our survey focused on the perceptions business owners in the Appalachian region of Maryland had about their operational systems. The results we found show that the majority of business owners have a good appreciation for their operational systems and seek out improvements to these systems. However, some of the findings lead to new questions for future studies to focus.

FUTURE RESEARCH

This study focused on five counties in Appalachia, and its findings may not necessarily be transferred to other populations. Although all the counties surveyed are in Appalachia, different results may be found in other areas in Appalachia with markedly different characteristics. A metropolitan area outside of Appalachia will differ from the study as well. A comparison study to other low-income areas of the United States would be beneficial for a deeper understanding of the businesses in impoverished rural areas. The study could also be expanded to include the length of time the firms had been in operation and the ethnicity of the manager to see if these factors make a statistically-significant difference in the firm's operation.

In relation to the findings on consultants, a new question was raised. Do Appalachian business owners have close-minded perspectives? In order to further study this mindset, the concept of internal consultants (employees) and business owner's perceptions on them could be evaluated. The prevalence of collaborative problem solving between employee and supervisor brought up a question on changes in Appalachian management. Is this movement from autocratic to participative management due to training, the educational level of the workforce, or just due to the firms adapting to a changing world? Furthermore, more investigation on the specifics of how operational problems are solved could be beneficial to the study. For example, are standard operating procedures, creative brainstorming, decision-trees, or logic used? The findings of our study shine a new light on the businesses of Maryland's Appalachia region; however there is much more to be answered. New studies on businesses in rural and impoverished areas and further studies on Maryland's Appalachian businesses are needed for us to gain a deeper understanding of these businesses and their operational systems.

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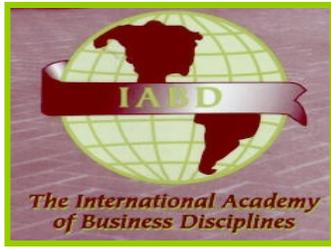
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*JOURNAL OF
INTERNATIONAL
BUSINESS DISCIPLINES*



Volume 8, Number 1

May 2013



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International Academy of Business Disciplines and Frostburg State University
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ISSN 1934-1822

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