Information Technology Usage In Accounting Firms: The Best versus The Rest

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Introduction

Investments in technology continue to represent a substantial component of business operating expenses. Increasingly, the academic literature indicates that these investments are impacting organizational performance (Bender, 1986; Clement and Gotlieb, 1987; Harris and Katz, 1990; Mahmood and Mann, 1993; Kivijarvi and Saarinen, 1999; Bharadwaj, Bharadwaj, and Konsynski, 1999). The widely touted benefits of Information Technology (IT), although difficult to quantify, drive firms to continue to invest large amounts simply to remain competitive. In the United States alone, $316 billion dollars was spent on IT by corporations in 1997. (5)

These investments in technology are inclusive of all sectors of the economy. Leading the way in 1999 was the banking and financial sector where IT investments accounted for 9% of total revenue. The median across all industries was 3.6% (Informationweek, 1999). These measures are up from 7% and 2% respectively in 1998 (Informationweek, 1998). Although spending on IT continues to increase, there is still substantial debate about the results of these investments.

The purpose of this paper is to analyze information technology expenditures in public accounting firms from a multi-year sample. This study also focuses on identifying possible IT spending trends in public accounting firms and attempts to determine if additional spending on IT increased the profitability of these firms.

Literature Review

Recently, researchers have devoted a growing amount of attention to investments in technology. Analysis of financial data and case studies present conflicting evidence that investments in technology are impacting organizational and/or financial performance in a positive manner.

Bender (1986) sampled 132 life insurance companies and found that total information processing expenditures were significantly related to the reduction of total operating expenses. In a separate case study of a life insurance company, Clement and Gotlieb (1987) concurred and found that IT investment improve productivity and processing time. Harris and Katz (1991) found that IT investments resulted in lower-cost operations. Mahmood and Mann (1993) studied the *Computerworld* "Premier 100" list of companies. They found a significant relationship between IT investment and several organizational strategic and economic performance variables.

Weill and Olson (1989) found no consistent relationship between investments in technology and organizational performance. They do suggest that different categories of IT investments should affect different performance measures. Others (Loveman, 1988; Weill, 1988) found no significant relationship between IT investments and organizational productivity and performance.

Because public accounting firms are engaged in providing timely advice to their clients, often regarding technology investments, they are one such group of technology users often forced by their list of services to rapid IT adoption in order to remain competitive. Boggs (1999) suggests that technology is revolutionizing the role of

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accounting and financial professionals by giving them more timely information and faster analysis. Ellis, Casey, and Flaherty (2000), in their study of public accounting firms, found that technology expenditures increased from 1997 to 1998 across the board. Additionally, Watters, Shipley, and Flaherty (2000) pointed out that CPA firms were increasing there usage of technology.

Methodology

The Texas Society of CPAs sponsors an annual management of accounting practices (MAP) survey. In addition to many other aspects of public accounting firms, the survey addresses a number of issues related to office technology usage and technology expenditures. The three most recent years of this survey contains a sample of over 1,400 firms in 1997, more than 1,500 firms in 1998 and just under 1,500 firms in 1999. Table 1 contains a summary of the respondents by state for the entire period.

TABLE 1: Number of Responses by State

State	1997	1998	1999
Arizona	99	115	99
Arkansas	43	38	25
Colorado	144	135	135
Iowa	55	48	45
Kentucky	-	51	45
Louisiana	86	96	68
Massachusetts	40	46	30
Minnesota	65	57	48
Mississippi	31	33	31
Missouri	-	-	37
Montana	17	-	-
New Jersey	155	142	146
North Carolina	88	-	79
Oklahoma	62	63	65
Oregon	-	52	-
South Carolina	-	47	-
Tennessee	-	-	30
Texas	433	356	334
Vermont	15	13	12
Virginia	85	78	76
Washington		111	98
West Virginia	36	38	35
Others	28	35	46
Overall	1482	1554	1484

The survey respondents reported their spending on Information Technology as a percentage of their total budget. The five categories for the responses were; (1) less than 1% (2), between 1% and 2.5% (3), between 2.5% and 4% (4), between 4% and 5% and (5), over 5%. The most profitable firms were designated as the top 25% most profitable firms in the survey. The current study focuses on differences in IT spending between the top 25% or the most profitable firms and the remaining 75%. Table 2 contains a presentation of the percentage of budget firms expended on IT for the three-year period. Table 3 contains a presentation of whether the firms' have Internet access and their own home page and also whether these firms file tax returns electronically. As in Table 2, these firms are split based on the top 25% most profitable firms and the remaining 75%.

TABLE 2: Percentage of Budget Spent on IT

1997	**National**	**Top 25%**	**Difference**	**z**
Less than 1%	11.20%	13.46%	2.26%	1.17
Between 1% and 2.5%	35.82%	43.39%	7.57%	2.61*
Between 2.5% and 4%	30.46%	27.09%	-3.64%	-1.22
Between 4% and 5%	10.05%	5.64%	-4.41%	-2.57*
Over 5%	12.49%	10.40%	-2.09%	-1.07
1998				
Less than 1%	9.65%	10.42%	0.77%	0.44
Between 1% and 2.5%	33.86%	41.68%	7.82%	2.79*
Between 2.5% and 4%	30.18%	27.99%	-2.19%	-0.82
Between 4% and 5%	12.33%	9.37%	-2.95%	-1.58
Over 5%	13.98%	10.45%	-3.53%	-1.79**
1999				
Less than 1%	8.07%	8.62%	0.55%	0.33
Between 1% and 2.5%	34.40%	36.97%	2.57%	0.90
Between 2.5% and 4%	29.54%	30.80%	1.26%	0.45
Between 4% and 5%	11.67%	12.75%	1.08%	0.56
Over 5%	16.33%	10.85%	-5.48%	-2.56*

* p<0.01
** p<0.05

TABLE 3: Internet and Electronic Services

1997	**National**	**Top 25%**	**Difference**	**z**
No Internet Access	32.22%	28.24%	-3.98%	-1.43
Business Home Page	10.75%	12.74%	1.99%	1.05
Electronic Tax Filing	26.81%	17.46%	-9.35%	-3.63*
1998				
No Internet Access	16.53%	15.57%	-0.96%	-0.45
Business Home Page	17.10%	17.10%	0.00%	0.00
Electronic Tax Filing	29.44%	17.14%	-12.30%	-4.76*
1999				
No Internet Access	9.16%	7.04%	-2.12%	-1.26
Business Home Page	24.61%	25.54%	0.93%	0.36
Electronic Tax Filing	35.65%	20.11%	-15.54%	-5.57*

* p<0.01
** p<0.05

Research Hypotheses

A statistically significant difference does not exist between the top 25% performing accounting firms and the national sample in the following areas:

1. The percentage of firms spending various percentages of their total revenue on IT.
2. The percentage of firms with no Internet access.
3. The percentage of firms with no business home page.
4. The percentage of firms offering electronic tax filing.

Data Analysis

The data were analyzed using a statistical technique that assesses the differences between two population proportions. The test statistic for the differences between two proportions is:

$$z = \frac{(\bar{p}_1 - \bar{p}_2)(p_1 - p_2)}{\sigma_{\bar{p}_1 - \bar{p}_2}}$$

where:

$$\bar{p} = \frac{(n_1 \bar{p}_1) + (n_2 \bar{p}_2)}{n_1 + n_2} \qquad \text{and} \qquad \sigma_{p_1 - p_2} = \sqrt{\bar{p}(1 - \bar{p})(\frac{1}{n_1} + \frac{1}{n_2})}$$

Results and Conclusions

Table 2 indicates that during 1997 and 1998, the most profitable accounting firms were congregated in the bottom two spending categories while the remaining 75% of accounting firms concentrated their spending between 2.5% and 5% of their total budget. During 1999, the most profitable firms accelerated IT spending but still had statistically significantly fewer firms in the top expenditure category.

At first glance it might appear that the more profitable firms were saving money by not investing in technology. However, a more likely explanation is that the more profitable firms are likely larger firms and spread their fixed investment in technology over a larger revenue stream, potentially one made possible by efficiency gains technology makes possible. However, it is also possible that the more profitable firms were early movers in terms of IT spending and are now reaping the benefits of earlier investments. The slight increase in two of the top three categories during 1999 could indicate a move to update some of those earlier IT investments.

Table 3 supports the view of the more profitable firms being early movers in IT spending. Note that in all three years of study the top 25% of accounting firms had greater access to the Internet than the remaining 75%. In addition, the most profitable firms were much more likely to have created a business home page. Both of these facts lend credibility to the early mover theory. However, none of the differences between the two groups are statistically significant when considering Internet access and home page usage. These two factors do not appear to impact profitability.

The only technology category that appears to be more frequently used by the national group is the filing of tax returns electronically. Electronic filing of tax returns is typically concentrated among lower income individuals. The more profitable firms apparently are not actively cultivating this particular client base and thus have a much smaller percentage that offer this service.

Overall, it appears that approximately 90% of all accounting firms are consistently spending between 1% and 5% of their revenues on IT. However, interestingly the most profitable firms appear to be spending less than their counterparts during 1997 and 1998. Further research is needed to determine whether these firms were indeed early movers and invested heavily in IT during prior years and are now reaping those benefits touted by the IT community or whether they are simply larger firms that are spreading a given IT investment over higher revenues. The other possibility is that greater profitability is completely unrelated to IT investments. 🕮

References

1. 1998 InformationWeek 500, **InformationWeek**, September 14, 1998.
2. 1999 InformationWeek 500, **InformationWeek**, September 27, 1999.
3. Anderson, D.R., D.J. Sweeney, and T.A. Williams, (1996) **Statistics for Business and Economics, Sixth Edition**, West Publishing Company.
4. Bender, D.H., (1986) "Financial impact of information processing," **Journal of Management Information Systems**, 3:2, pp.22-32.
5. Bharadwaj, A., S. Bharadwaj & B. Konsynski, (1999). "Information technology effects on firm performance as measures by Tobin's q," **Management Science**, 45:6, 1008-1024.
6. Clement, A and C.C. Gotlieb, (1987). "Evaluation of an organizational interface: the new business department at a large insurance firm," **ACM Transactions on Office Information Systems**, 5:4, pp. 328-339.
7. Ellis, T.S., K.M. Casey, and D.J. Flaherty, (2000). "Public accounting firms and information technology: adoption, usage, and expenditures," **Journal of Computer Information Systems**, 40:3, pp. 10-14.
8. Harris, S.E. and J.L. Katz, (1991). "Organizational performance and information technology intensity in the insurance industry," **Organization Science**, 2:3, pp. 263-295.
9. Judge, P.C., P. Burrows, and A. Rheinhardt, (1998) "Tech to the Rescue," **Business Week**, pp. 30-31.
10. Kivijarvi, H., and T. Saarinen, (1995). "Investment in information systems and the financial performance of the firm," **Information and Management**, 28, pp.143-163.
11 Loveman, G. (1988). "An assessment of the productivity impact of information technologies," Sloan School of Management, MIT, working paper, Management in the 1990s.
12. Mahmood, M.A. and G.J. Mann, (1993). "Measuring the organizational impact of information technology investment: an exploratory study," **Journal of Management Information Systems**, 10:1, pp. 97-122.
13. Watters, Michael, Calvin Shipley, and Daniel Flaherty (2000) "CPA firms increasing utilization of CIS technology," **The Review of Accounting Information Systems**, 5:1, pp. 11-16.
14. Weill, P. (1988). "The relationship between investment in information technology and firm performance in the manufacturing sector," Ph.D. Dissertation, Stern School of Business, New York University.
15. Weill, P., & Olson, M. (1989). Managing investments in information technology: mini case examples and implications. *MIS Quarterly*, 13(1), 3-16.

Notes