

PORTRAIT OF BUSINESS TECHNOLOGY IN A TYPICAL AMERICAN TOWN

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ABSTRACT

Most business technology surveys are conducted by vendors who primarily have an interest in large companies (ie - Fortune 1000) to whom they can sell lucrative contracts. The reality is that the majority of employees in America work for smaller companies. There is a need for unbiased, non-vendor-supported research into which technologies American businesses are actually using today. This survey reports on the technology in use in a typical American town. These results are more relevant to students and prospective employees than what they typically might see in the business or industry press.

INTRODUCTION

There are plenty of marketing surveys of the type of technology in use in American Business today. Unfortunately, there are five flaws found in existing survey methods. The flaws lead to several errors that commonly produce biased and misleading results.

First, most research is sponsored, either directly or indirectly, by the vendors of the very technology that is being measured, so the sample populations tend to come from their prospective client bases. Therefore, the sample population often does not include companies who focus minimally on technology. The sample also tends to miss companies who do not have a dedicated CIO (Chief Information Office) or other senior decision-maker dedicated to managing technology within the company.

This particular problem became apparent to me in January of 2004 at an invitation-only conference of a well-known commercial research group. The presenter showed a graph entitled "LAN Speeds in Use" that seemed to show that the majority of American businesses use **Fast Ethernet**, or **Giga Ethernet** (over 90% of the 600 study subjects). Since my own experience was quite the opposite, I questioned their data. Upon further investigation, the presenter indicated that the sample came from a population of customers and potential customers of the vendor who sponsored the study (a Fast/Giga Ethernet Switch vendor). This is similar to asking people in a coffee shop if they drink coffee.

Second, the surveys tend to focus on an individual technology instead of combinations of technologies. As

Michaels pointed out (2004), real technology must be addressed in combinations of multiple related technologies rather than separated and addressed one or two at a time. It would make no sense, for example, to survey primarily Windows Server users on their Oracle implementation or the amount of Open Source software they use. That would be similar to asking people in a health food store which fast food restaurants they frequent.

Third, even third party polls and studies conducted by "independent" publications and research groups are normally studies **of** technology **for** technologists **by** technologists. Choices of "none" or "manual process" are not usually included.

Fourth, most polls of this type are conducted electronically, which greatly eases the administrative headaches of conducting a survey (and is the major force behind the plethora of surveys available on technology use today). Unfortunately, using technology to survey the use of technology introduces an inherent bias - only the technically literate will respond. The non-technical folk are discouraged by the survey method, and as a result are not represented well in the population.

Finally, also because of the focus on the population of companies with dedicated CIOs, the data is biased towards larger companies. Dehning and Richardson, (2002) noted this problem in a widely publicized research synthesis. According to the Small Business Administration, the majority of businesses in this country are small businesses (less than 500 employees). According to Yegge (2001) 89% of those are very small, with 20 or fewer employees. Furthermore, the needs of small closely-held

companies are not the same as those of larger public companies.

OBTAINING UNBIASED RESULTS

Despite (and perhaps because of) the proliferation of biased survey results, there is a paucity of unbiased survey results. There is a need to conduct general survey of the technology in use by businesses in a typically small American town with more typically small businesses using unbiased survey methods. This information is essential for educational and economic planning. Students preparing for employment and counties trying to attract businesses should be aware of actual technology use, not the tainted picture painted by the media. Additionally, many studies show that the level of technology use affects both the profitability of a company as well as its stock price (Dos Santos, et al. 1993; Brynjolfsson et al, 2000; Poston and Grabski, 2001)

To obtain a more accurate picture, this study needed to be conducted via mail and fax, both sufficiently ubiquitous that they would not introduce bias into the results due to electronic data gathering techniques.

SURVEY METHODS

We sent the survey (Appendix A) to 2300 businesses that are members of the Berks County Chamber of Commerce. Two hundred seventy three responses were received either via the fax or through the mail. The sample was confirmed to be a stratified sample from the four major size demographic groups (business size) of the Berks Chamber to ensure that all business sizes were represented.

DEMOGRAPHICS

The size of the responding companies can be found in Figure 1 & 2, revealing a relatively even split between tiny, small, and medium. The sample was representative of the companies that would belong to a Chamber of Commerce.

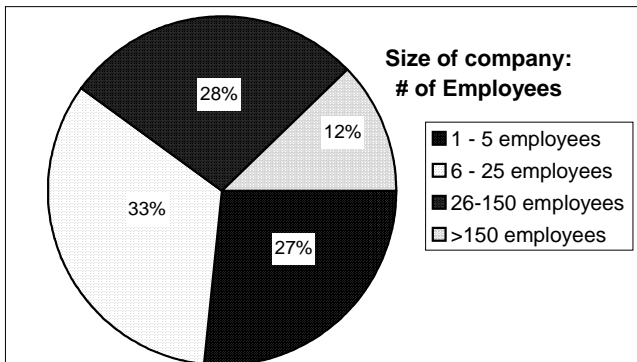


Figure 1. Size of Company by Number of Employees

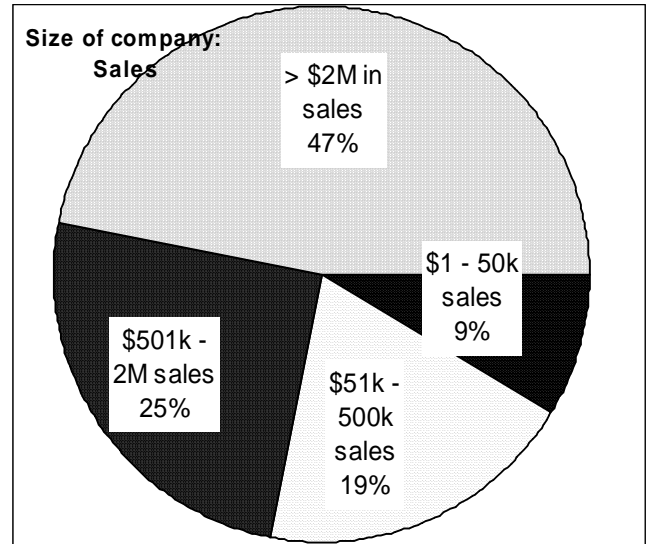


Figure 2. Size of Company: Sales

The population also tends toward local, rather than non-local clientele. In Figure 3, you see that less than a quarter sell outside of the state region.

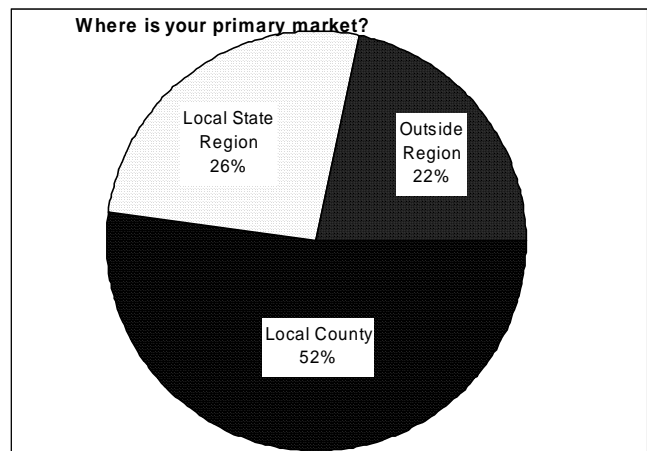


Figure 3. Primary Market

RESULTS

The first question dealt with email. Over 93% of the responding companies had some kind of internet email, but not all of them had everyone on email, as can be seen in Figure 4.

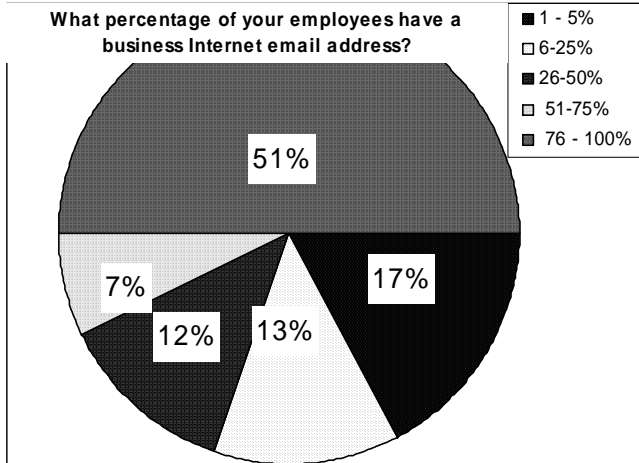


Figure 4. Percentage of Employees with Email

Spam (unsolicited bulk email) is becoming a problem - though most companies are dealing with it so that end users don't necessarily have to complain. According to the results shown in Figure 5, 57% of businesses spent time and money filtering out spam for their employees.

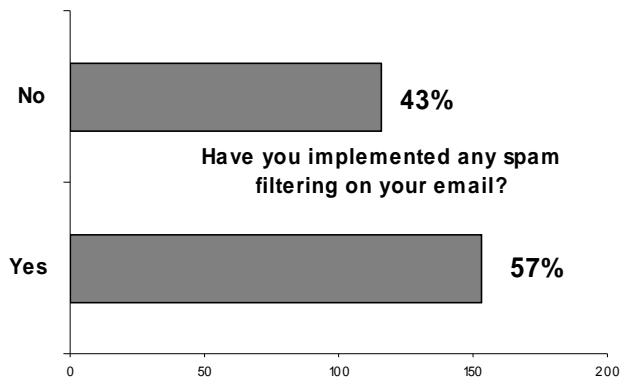


Figure 5. Have You Implemented Email Filtering?

As can be seen in the graph in Figure 6, only 38% of employees complained about spam.

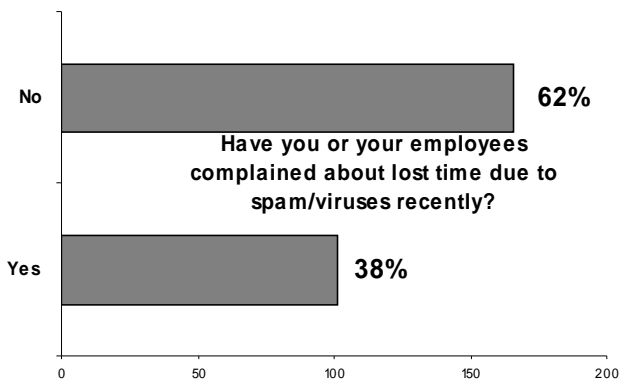


Figure 6. Employee Complaints of Spam

As shown in Figure 7, those who don't filter can expect to see a significant portion of their inbox filled with spam.

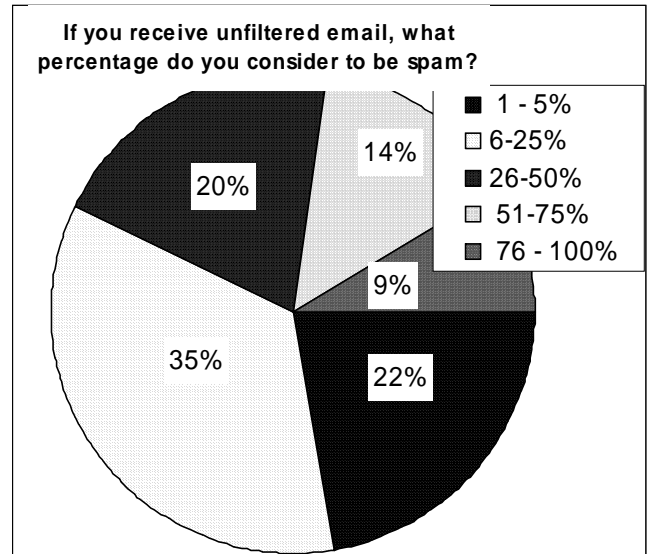


Figure 7. Percentage of Email that is Spam

The number of domain names registered haven't changed within the last year as can be seen in Figure 8. Obviously, those companies who could benefit from a web page already had one.

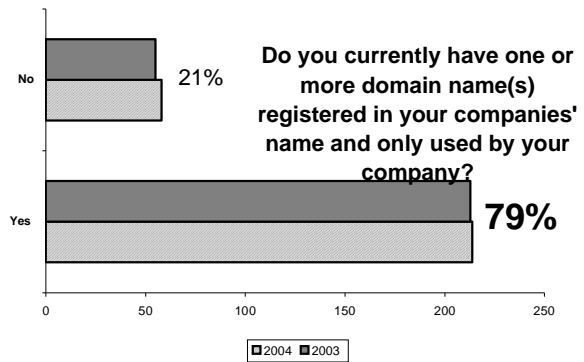


Figure 8. Domain Name and Web sites

Not surprisingly given the lack of attention to e-commerce recently, the number of companies who were planning to actually implement sales transactions on their web sites has declined (Figure 9). Additionally, last year almost half of the companies said they were already doing e-commerce. This year less than a quarter answered similarly. This may be attributed to a slight wording difference. Last year, if a company sold goods on a "third party site" like Amazon.com, it was considered e-commerce. This year we specified "your" web site in the survey.

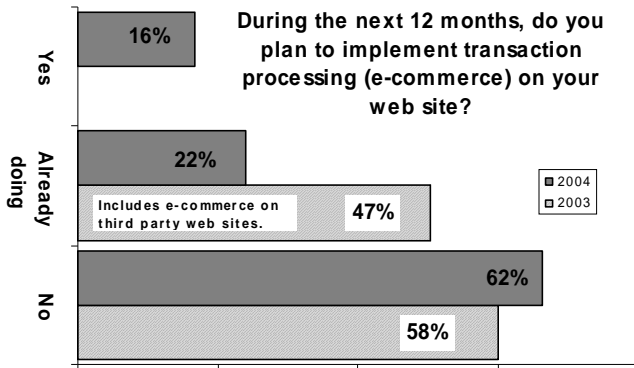


Figure 9. E-commerce on Web site?

Of those companies who had a web site, they tended toward in-house or local developer as shown in Figure 10. Less than 15% chose a web developer outside of the local region.

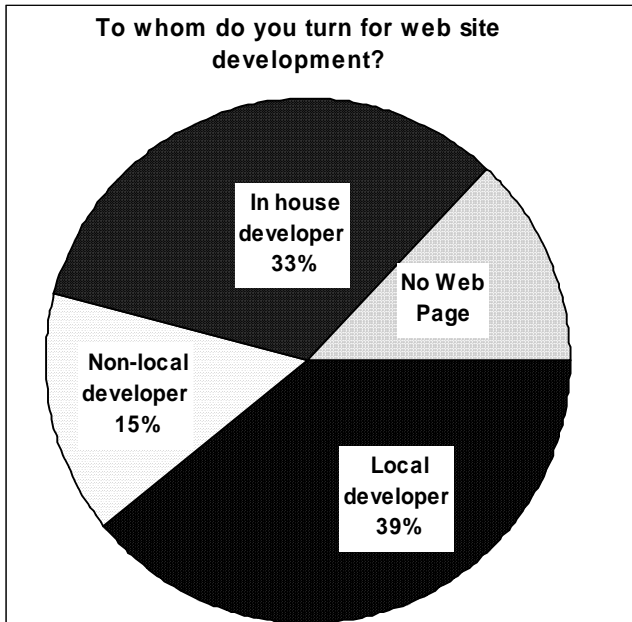


Figure 10. Web site Development

The majority of businesses in the sample group are still using either leased line (which included frame-relay) and dialup (plain old telephone) connections to the Internet as can be seen in Figure 11. However, in last year's survey a tiny percentage were on DSL or Cable (ie - broadband connections) and now 38% of the businesses are using broadband. You will note that in Figure 12, however, less than a quarter of the businesses plan on changing this year, which indicates that about half of those who were going to get broadband went ahead and did so. Last year 50% of the businesses planned on increasing their connectivity to the Internet.

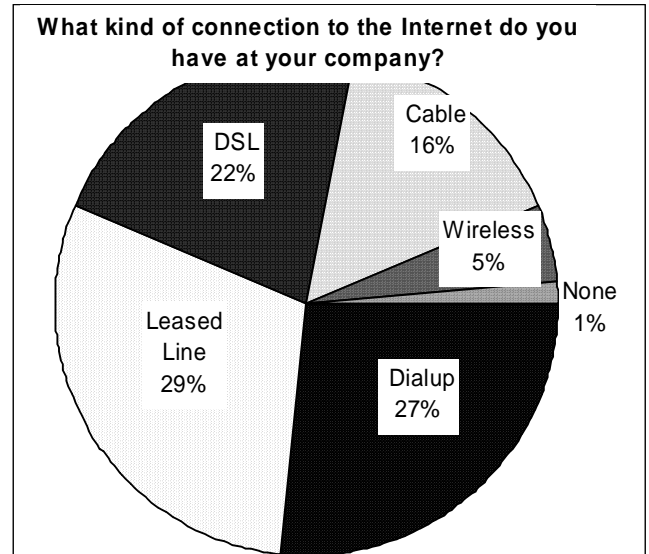


Figure 11. Type of Internet Connection

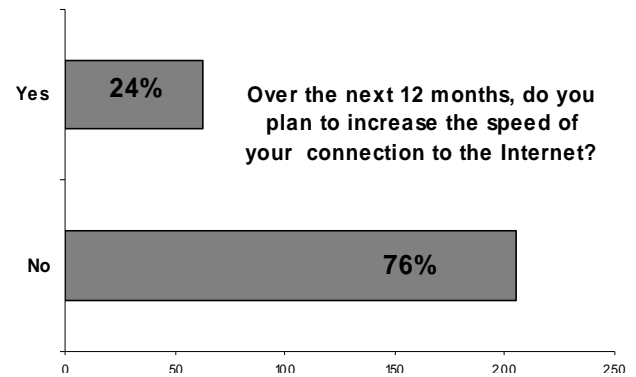


Figure 12. Plans for Increasing Bandwidth to Internet

Figure 13 shows the operating systems in use. As expected, the majority of businesses are using one of the newest Windows operating system on their desktop. A surprising 27%, however, are still using Windows operating systems that are no longer "supported" by Microsoft. A distant third place goes to Macintosh, which is staying surprisingly resilient. In 2003, Macintosh Operating System was not given as a choice, and it still got third place through a "write in" vote. Linux, Unix, and Minicomputer operating systems are vying for the remaining share and are divided equally.

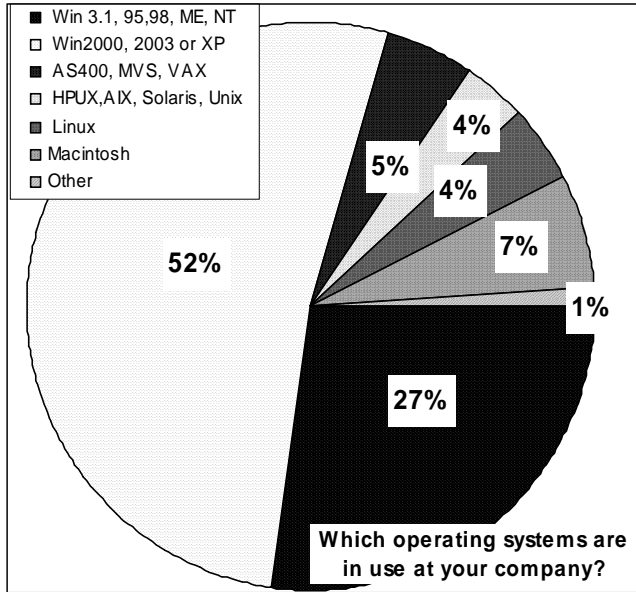


Figure 13. Operating Systems In Use.

One of the most interesting questions in this day and age of complexity is to whom the typical decision maker turns for information on technology. Figure 14 shows the sources of information used by decision makers. Last year, multiple answers were encouraged, so Publication and the Web, Vendors, and Local Consulting firms received a high percentage of responses. This year, the question encouraged single answers (ie - "most trusted source") and the answers put Local Consulting Firms at the top of the list with Vendors and Publications behind it. For the first time we also saw the impact of Family and Friends, which took a remarkable 10%. Suspicion of expensive advice is reflected in the poor showing two years in a row for top consulting companies. Despite their reputation, less than 6% identified them as the most trusted source.

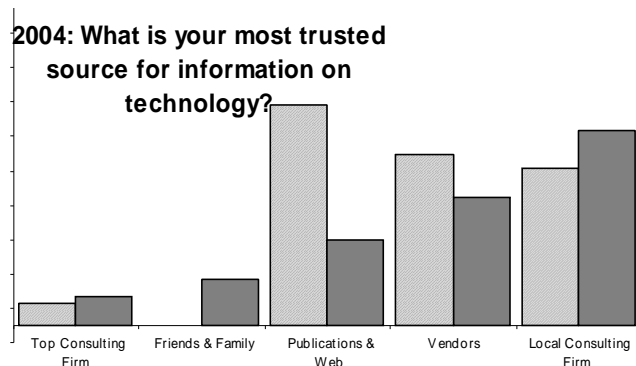


Figure 14. Trusted Source for Information on Technology

One of the most interesting surprises turned out to be the question designed to identify who the top decision maker was when it came to technology decisions (Figure 15). The expectation was that the CIO (Chief Information Officer) or IT (Information Technology) Director would

have the lion's share of the decision making responsibility for technology decisions. Our findings indicate that, much like all other major decisions, the CEO, Executive Director, or President makes the final decision rather than the IT person. Less than a quarter of the IT people makes the technology decisions.

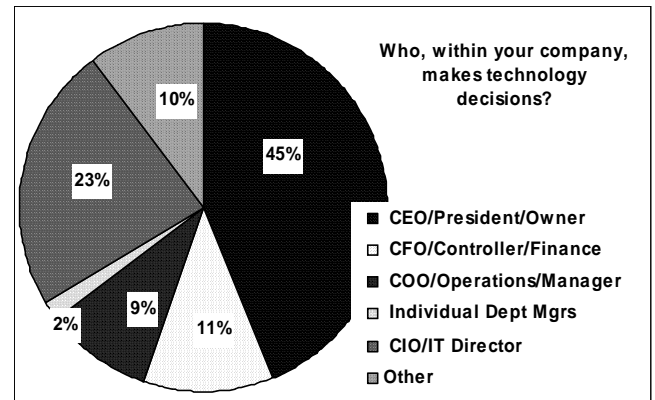


Figure 15. Who Is Technology Decisionmaker

One outstandingly clear perception came across: despite all its problems, technology brought value to those who implemented it as shown in Figure 16. Early research, often called the "Productivity Paradox" as described by Brynjolfsson (1993) showed that implementing technology did not bring hard-dollar improvement to the bottom line in companies implementing it. The reality in the field, however, is that 97% of the companies that implemented technology thought that it had brought them value - 68% of them saying "much value". This result was not limited to soft dollars or fuzzy perceptions, however. The same 97%, (shown in Figure 17) had reported a positive Return On Investment from their technology projects.

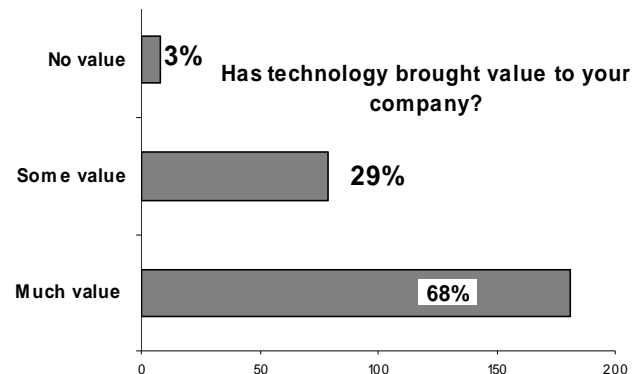


Figure 16. Perception of Value

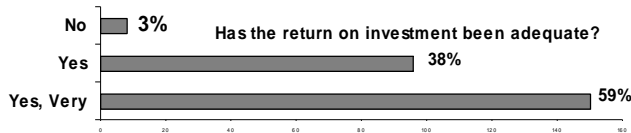


Figure 17. Return on Investment

SUMMARY

This survey has already been useful to economic planners as it was used as the basis for need in a grant to the Reading Community Foundation to increase the infrastructure choices for internet connectivity in downtown Reading. It can also be useful to local colleges and universities in planning their education so that curriculum of business and technology students matches the needs of the more typical businesses at which students would eventually be employed.

Though useful, this survey provides descriptive statistics only, and is the first step in trying to determine if there is, indeed, a difference between the "perceived" level of technology use presented by the media and the "actual" level of technology use presented in unbiased surveys of this type. Future investigations will compare the results found here to technology use found by reviewing the media published surveys and polls.

Another potential use for the survey is to dig deeper into one of the questions. For example - the response to the question of *Who makes the technology decisions?* was a surprise. Further investigation can compare the factors of technology decisions to the decision making factors of consumer goods such as those studied by Hibbs and Sraiheen (2001).

In any case, accurate reflections of technology use in businesses today will enable better planning and decision-making by those who must implement and accommodate new technologies.

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Appendix A

Berks County Chamber of Commerce 2004 Technology Survey

Please fill out and fax back to 610-376-4135, or mail to Suite 101, 601 Penn Street, Reading PA 19601 by January 20, 2004

Size of Company (Sales and # of Employees)

1. 1 - 5 employees 6-25 employees 26-150 employees >150 employees
2. \$1 - 50k sales \$51k-500k sales \$501k-2M sales >\$2M sales
3. Where is your primary market? Berks County Southeastern PA Outside Region
4. What percentage of your employees have a business Internet email address?
 1 - 5% 6-25% 26-50% 51-75% 76 - 100%
5. Do you currently have one or more domain name(s) registered in your companies' name and only used by your company? Yes No
6. During the next 12 months, do you plan to implement transaction processing (e-commerce) on your web site? Yes No Already doing
7. To whom do you turn for web site development?
 Local developer Non-local developer In house developer No web page
8. What kind of connection to the Internet do you have at your company?
 Dialup T-1 (full, fractional, frame relay) DSL Cable (i.e. - Comcast) None Wireless (Satellite)
9. Over the next 12 months, do you plan to increase the speed of your internet connection to the Internet? Yes No
10. Have you implemented any spam filtering on your email? Yes No
11. If you receive unfiltered email, what percentage do you consider to be spam? (spam is unwanted bulk email)
 1 - 5% 6-25% 26-50% 51-75% 76 - 100%
12. Have you or your employees complained about lost time due to spam/viruses recently? Yes No
13. Which operating systems are in use at your company?
 Win 3.1, 95,98, ME, NT Win2000, 2003 or XP AS400, MVS, VAX
 HPUX,AIX, Solaris, Unix Linux Macintosh Other_____
14. What is your most trusted source for information on technology?
 Top Consulting Firm (Gartner, Giga, Meta, Forest, other) Friends & Family Publications & Web
 Vendors (Microsoft,Oracle,CompUSA,Staples,Dell,Gateway,etc.) Local Consulting Firm
15. Who, within your company, makes technology decisions?
 CEO/President/Owner CFO/Controller/Finance VP COO/Operations/Manager
 Individual Dept Mgrs CIO/IT Director/ IT Manager* Other_____

*IT stands for Information Technology. May also be DP (Data processing), EDP (Electronic Data Processing), or IS (Information Systems)

16. Has technology brought value to your company? Much value Some value No value
17. Has the return on investment been adequate? More than adequate Just adequate Not adequate

Company Name _____

Company Web page URL: _____

Contact Person (optional) _____ Phone _____

Email _____

Please be assured that only aggregate results of the survey will be available. Your name, number, and email address will be separated from the results, and shall remain confidential. This information will not be used for soliciting or promotional purposes. Individual information will not be released by the survey compilers to anyone under any circumstances.