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Overcoming the downsides of personal internet and cell phone use in the workplace: An exploratory empirical analysis

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ABSTRACT

The now taken-for-granted introduction of internet usage into the workplace changed the dynamics of work, productivity, and management, and this is now further complicated by the ubiquitous availability of personal cell phones, going beyond company supplied and (partially) controlled computers with internet connections. This paper studies the connection between internet and cell phone usage by employees and firm productivity. Using primary data collected via a self-reported survey, we conduct an empirical analysis utilizing information based on firm and industry characteristics. Results indicate that the level of non-work-related internet and cell phone usage is significantly associated with firm productivity. Some of the negative aspects of internet availability can be mitigated by internet governance policies and systems to monitor the internet usage of employees. This paper offers suggestions so that firms are able to maintain the positive aspects of employee personal and business internet/cell usage while mitigating other more negative aspects including productivity losses.

Keywords: Technology, Productivity, Internet usage, Cell phone use, Small-Medium firms.

INTRODUCTION

The Internet, cell phones and other connected electronic communication media equipment and resources are not only examples of work system tools or methods, but are also a source of personal entertainment and enjoyment. Teo, Lim and Lai (1999) explain that the rate systems adopted are directly influenced by both extrinsic (perceived usefulness) and intrinsic (perceived enjoyment) factors.

This suggests that electronic media as a system is adopted by users partly because it is work-related and useful, and partly because users find enjoyment in using this media. In the workplace, these two factors are sometimes working against each other as the extrinsic factors increase the productivity of the firm while intrinsic factors may decrease productivity.

The managerial problem is how to use the internet and other contemporary media devices for maximum productivity increases while at the same time controlling or mitigating the negative aspects of this technology.

Personal computers were introduced into business work places over forty years ago, and computerization has been shown to have had positive impacts on work output and productivity in a variety of work places Good and Stone (2000). Using

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computers for mundane and repetitive tasks, for example, makes it possible to relieve human workers from some of these depleting activities, and has decreased safety risks in some facilities McDonald (2006). As well, the use of computerized spreadsheets has similarly increased the speed and accuracy of forecasting and creating pro-forma statements, creating huge time and efficiency benefits.

Today, we tend to take these benefits as established practice and take the media for granted.

In the mid-1990s, with the introduction of the Internet and the World Wide Web, companies further realized the benefits of computer power. Like computerization in the 1970s, the introduction of the World Wide Web as an avenue for productivity had far reaching impacts. The Internet has allowed research to be completed faster and more thoroughly (Derek and Walker ,1999). The Internet has been a factor in revitalizing businesses by providing access to new markets, and offering an easier search for new opportunities for all businesses, and enabling other benefits Ana Rosa del, Sebastian and Antonio (2002).

However, there is a dark side to electronic media, and most employers take a dim view of computer or Internet misuse. Companies such as Dow Chemical, Merck, and Xerox have all terminated large numbers of employees for abuses that include accessing explicit pornographic web sites and other abuses Johnson and Rawlings (2003). Terms such as "cyber slacking" and "cyber loafing" have entered the vernacular to describe time wasted by workers who are using company owned computer networks for personal use instead of engaging in work-related activities Mills, Hu, Belmont and Clay (2001). In addition to misusing valuable computer resources and causing productivity losses, cyber slacking also opens organizations up to a variety of legal liabilities ranging from sexual discrimination to criminal acts being committed while using computer resources belonging to the firm Mills et al. (2001).

Methods of work continue to change as new technology is introduced, especially in areas of communications. Organizations have come to expect workers to pursue efficient means of communicating and performing various work tasks, encouraging the use of internet resources for the good of the firm Sharma and Gupta (2003/2004). Computers can obviously allow many work tasks to be performed faster and more accurately, thus offering some reductions in the number of employees per unit of output, among other gains in efficiency.

However, there is little evidence that investment in technology alone is the single factor that results in overall financial gain for the firm Sharma and Gupta (2003/2004). The technology policies have greater nuance than what most organizations realize. Also, internet and phone usage present separate productivity issues. Hence the hypothesis of the paper is as follows: *does work productivity decrease as employee usage of personal internet and other communication technology increases at work?*

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This paper proceeds in the following manner: Section two will discuss the related literature on worker productivity and communication technology usage, Section three will describe the data used for our empirical analysis, Section four outlines the empirical model and methods, Section five discusses the results of the models, and Section six concludes with policy recommendations based on the findings of this empirical research.

LITERATURE REVIEW

Productivity gains from information technology advances are well documented in the empirical literature. This literature can be fragmented into three different levels based on the data used for analysis: country, industry or firm level Pilate (2004). Country level macro studies tend to find a positive or no relationship between the use of information technology and productivity Najarzadeh, Rahimzadeh, and Reed (2014); Belorgey, Lecat, and Maury (2006); Ceccobelli, Gitto, and Mancuso (2012); Oliner and Sichel (2003); Thompson and Garbacz (2007). At the industry level, Han et al. (2011) find a positive relationship between information technology investment and productivity, and Engelbrecht and Xayavong (2006) found productivity growth in information technology-based industries improved more over time than for other industries.

At the firm level of analysis, most studies find a positive relationship between information technology and productivity—though a few studies find an insignificant relationship. Nurmilaakso (2009); Bartel, Ichniowski, and Shaw (2007); Arvanitis and Loukis (2009); Black and Lynch (2001); Grimes, Ren, and Stevens (2012); Sanchez et al (2006); and Maliranta and Rouvinen (2005) all find evidence of a positive relationship between the use of information technology and productivity across different samples and using a variety of methods and measures of both technology and productivity. Badescu and Garces-Ayerbe (2009) initially find a positive relationship but find no impact after controlling for firm and time specific factors. Additionally, Colombo, Croce, and Grilli (2013) studied small and medium-sized enterprises finding no impact of Internet technology usage on productivity. Akerman, Gaarder, and Mogstad (2015) estimated a positive relationship between Internet access and skilled labor productivity, but a negative relationship between Internet access and unskilled labor productivity.

This relationship is similar to that found by Luque and Miranda (2000) when studying technology and wages/mobility – finding no significant effect with highly skilled workers.

Of the literature discussed above, the focus is on the benefits of information technology—rarely discussing or acknowledging the opportunities provided for shirking or cyber loafing. A few researchers have focused on productivity losses

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and declines from non-work-related computer usage. One survey conducted by Vault.com for the study "Internet Usage at Work" showed that 25 percent of workers surveyed admitted to spending some amount of time each day using the Internet for purposes other than work – some more than an hour per day Sharma and Gupta (2003/2004). Sharma and Gupta (2003/2004) explore a variety of ways that technology and use of the Internet have improved communication and the potential for efficiency in organizations, but also note that these technology resources are abused significantly and regularly, thus contributing to productivity losses instead of contributing to productivity gains.

Mahatanankoon, Anandarajan and Igbaria (2004) describe activities that workers perform outside the normal range of activities required for their job as Personal Web Use (PWU) in the workplace. Their study describes and analyzes three dimensions of PWU - personal external business, personal external socializing, and personal external interest and research. PWU is described as potentially opening organizations to loss of productivity and increased liabilities. Significantly, the researchers also suggest that some PWU in the workplace can lead to a healthy level of productivity, and so all PWU does not necessarily have negative consequences. A related work expands this thought, suggesting that some PWU may provide for some workers a needed distraction, not unlike "stress relief" activities (Anandarajan and Simmers, 2004).

Identifying reasons or motivations for employees abusing computing resources at work was the focus of a study by Bock, Park, and Zhang (2010). The study concludes that so-called Non-work Related Computing (NWRC) is more a function of inappropriate habits than deliberate and intentional action. Suggested mitigating factors for NWRC include identifying the activity that can lead to habit formation, and intentionally forming appropriate work habits instead. Mahatanankoon et al. (2004) theorize that low job satisfaction among workers could also be a contributing factor, or perhaps creates a sense of balance and fairness given the expectation of 24/7 communication availability of employees by many employers.

As noted above, prior research documents, categorizes, and calculates productivity losses due to habitual or intentional misuse of company Internet resources. Yet, management policy and practices resulting in a sense of employee empowerment and job satisfaction are essential factors for corporate productivity Prema (2011).

More freedom for employees to use the Internet for personal use while at a work location is an indicator of companies that want higher levels of worker empowerment and trust, both of which are frequently mentioned factors in increased job satisfaction Bakotic (2016). Conversely, low levels of job satisfaction can contribute to deviant behaviors, many of which are associated with lower productivity Mahatanankoon et al., (2004). So, although the internet and computer mediated communication and access can be abused at work, an argument can be made that to demonstrate managerial/leadership trust of employees, and thus

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hopefully increase productivity and employee job satisfaction, some open access to personal, PWU or NWRE should be allowed or even encouraged. The optimal balance between work focus and non-work focus becomes the critical question.
Ramaya's (2010) survey of employees found that 25% of a typical day is spent engaging in non-work computing activities and thus found that greater personal web use lead to less worker efficiency and thus lower productivity. Khansa et al. (2017) also surveyed workers to ascertain the predictors of personal web use at work finding the predictors change in part dependent on whether the organization has instituted a personal web use policy. Even though the antecedents to cyber loafing may differ somewhat dependent on the existence of a policy, Ahmad and Jamaluddi (2010) find that computer usage policies do not seem to necessarily have much of an impact on employee's attitudes or behaviors regarding personal web use at work. Koay and Soh's (2018) meta-analysis of studies focusing on cyber loafing and employee performance resulted in mixed results—with some research indicating no relationship between performance and cyber loafing, but with most of the literature indicating a negative relationship.
The intent of our study is to determine the extent to which productivity at work is influenced by, or is a function of, company permissiveness regarding the use of the Internet and personal communication devices at work. Our hypothesis is that organizations that make access available to workers have a higher level of productivity than organizations that do not.

Data

Non-business use of computer resources during the work day is inevitable. Most companies allow "reasonable" use of the Internet, however, few companies define precisely what "reasonable" means Hoffman, Hartman and Rowe (2003). To study the impact on performance for companies permitting employee use of the Internet at work compared to companies not permitting this access, we administered an online survey consisting of 40 questions. One individual leader and/or manager per organization was invited to participate via email invitation. At the end of the survey period, about 100 responses were received out of the 2000 potential participants, and of these eighty-one were complete and useable.

Descriptive statistics for the sample of 81 firms are presented in Table 1.
Variables collected via the survey include firm characteristics (region, industry, productivity, etc.), worker characteristics (race, gender, age, education) and technology use policies for computer and cell-phone use.

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Variable	n	Min	Max	Mean	Std. Deviation
Age Bracket	81	2	6	4.34	1.13
Male=1, Female=0	81	0	1	0.53	0.50
Race Bracket	81	1	5	4.91	0.50
Education Bracket	81	1	6	3.58	1.04
Firm Sales Bracket	81	1	5	2.31	0.89
Firm Industry	81	1	9	5.54	2.15
Agriculture Industry?	81	0	1	0.53	0.50
Mining Industry?	81	0	1	0.09	0.30
Construction Industry?	81	0	1	0.23	0.43
Service Industry?	81	0	1	0.14	0.34
Region Bracket	81	1	4	1.98	1.23
North?	81	0	1	0.14	0.36
East?	81	0	1	0.57	0.50
South	81	0	1	0.09	0.28
Years in Business	81	4	164	44.07	33.19
Annual Sales Dollars	81	10,000	2.00e+09	3.77e+07	2.22e+08
Productivity	81	12	4.00e+07	837,693.50	4,618,847
Log of Productivity	81	1.08	7.60	5.02	0.82
Pert. Males	81	0	100	53.89	31.53
Pert. African American	81	0	90	3.79	11.41
Pert. Native American	81	0	20	0.52	2.36
Pert. Asian	81	0	30	1.70	5.05
Pert. White	81	0	100	77.70	29.00
Pert. Other Race	81	0	100	3.61	15.86
Pert. Age Under 30	81	0	90	22.79	21.27
Pert. Age 30 – 39	81	0	90	22.62	16.77
Pert. Age 40 – 49	81	0	90	22.86	18.07
Pert. Age 50 – 59	81	0	69	19.23	16.45
Pert. Age 60+	81	0	50	6.80	8.25
Pert. Not HS Grad	81	0	85	5.78	13.05
Pert. HS Only	81	0	100	48.37	34.83
Pert. Associate Degree	81	0	75	10.80	14.68
Pert. Bachelor Degree	81	0	90	26.06	25.74
Pert. Master Degree	81	0	56	4.75	10.04
Pert. Doctorate Degree	81	0	33	1.47	5.57
1=Computer Use Policy, 0=No	81	0	1	0.70	0.46

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1=Filtering System, 0=No	81	0	1	0.33	0.47
1=Access logged, 0=No	81	0	1	0.32	0.47
1=Cell allowed, 0=No	81	0	1	0.79	0.41
1=Time Provided, 0=No	81	0	1	0.42	0.50
Lagloglbpr	80	2.70	7.60	5.07	0.69

Focusing on the region variables, respondents were located mainly in the Eastern region of the United States (57%), with both the Northern and Western regions representing 17% of respondents, and the South representing 9% of respondents. With respect to industry categorization, the largest percentage of respondents represent the Finance Industry (30%), followed by Transportation (21%), Wholesale Trade (16%), Mining (8%), and 12% of respondents (10) indicated an industry other than those that we included in our survey. Firm ages ranged from 4 years-old to 164 years-old, with a mean age of 41.4 years. We expect to see variations between newer firms to older firms since more recently started firms would more likely be aware of newer technology and social media, whereas older firms may adopt these new and challenging opportunities more slowly Beier (2019).
In the survey we also explored workers' demography. The survey reveals that on average 26.72% of employees at the sampled firms are part-time employees, thus about 73% of workers in responding firms are full-time workers.
We would expect full-time workers on average to be more committed to success of the firm vs. their part-time co-workers, and hence would tend to spend less time on unproductive activities Nelen, Grip, and Fouarge (2011).
The worker gender mix of respondents leans slightly toward male, with the mean percentage of male workers measuring about 52%.
Additional demographic variables include the racial mix of workers at responding firms.
Almost 77% of employees are Caucasian in our sample, with 76 our of 81 firms reporting a majority proportion of white workers. We collected worker age on an ordinal scale by dividing age into various categories and found the majority of workers are 40 years old or older which is on average about 36% of the total workers in a firm. We found that nearly 50% of workers in the firms represented by our survey only attained a high school education as their highest level of education.
Lastly, we asked technology-based survey questions. About 70% of workers have access to the Internet while at work, with all respondents indicating at least some workers have access to the Internet, and 41% of companies responded that 100% of workers have access.
Attempting to gauge managers' attitudes toward worker discretionary use of technology at work, which is the primary question of this survey,

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we asked if respondents have a Computer Use Policy in place and 65% of respondents indicate the presence of such a policy. Also, as a proxy for managers' attitudes toward worker discretionary use of time at work, we asked whether workers are permitted to use their Internet at work for personal purposes. This may be a close indicator of management's attitude toward non-work-related use of the Internet; 72% of firms report that they permit workers to use their Internet at work for personal use.

METHODOLOGY

The primary goal of this paper is to understand how employee personal Internet usage policy affects firms' productivity. This connection remains inconclusive from a review of current literature. We have cross-sectional primary data collected from a random survey, and we then estimate a linear model using Ordinary Least Squares methodology using cross-sectional primary data. Our empirical model estimated for *i* firms is as follows:

$$Y_i = a_i + \alpha X_i + \beta \textit{ Company Computer Policy} + \pi \textit{ Cell phone} + \varepsilon_i \quad (1)$$

where Y is our dependent variable, log (labor productivity), X is a vector of control variables, and ε is the error term. The X vector includes indicators for industry and region, as well as the age of the business, proportion of white employees, proportion of high school educated employees, proportion of male employees and the proportion of employees under 30 years old. We also included the lagged dependent variable on the righthand side of the estimated equation.

RESULTS

Table 2 in the Appendix presents the results of the cross-sectional data analysis. Six empirical models are used to analyze the results. Model 1 is the base model with only control variables. Overall, there are seven control variables that appear to be significant in Model 1, which are lagloglbpry (Lag Log Labor Productivity), Mining, Construction, North, East, South, and Age of Business. We used six types of industry variables in this model and only two variables enter significantly in the model. Both the Mining and Construction variables are significant at the 1 percent level and holding a positive sign which indicates that holding all other variables at a constant level, the numbers of Mining or Construction industries positively impact the firm's labor productivity. On the contrary, for a firm operating in the Service

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industry, no significance in labor productivity is observed while all other variables remain constant in the model.

Two of the location variables are significant at the 1 percent level with a negative sign (North and East), and one is significant at the 5% level with a negative sign (South) in Model 1, which indicates that if a firm is located in the North, South, or East regions of the country labor productivity will decrease in comparison to the Western regions of the country, while holding all other variables constant in the model.

The next significant variable is lag log labor productivity. Organization performance depends not only on the current activities, but also depends on the performance history of previous years, so to control that we used lag of log productivity variable in the model. This variable is significant at the 1 percent level with a positive sign which indicates that past year labor productivity significantly influences next years productivity while other variables in the model are constant.
In Model 2 we added four explanatory variables, and three of them were significant at the 1 percent level; Percentage of White Workers with a positive sign, Percentage of Workers with high school as their highest level of education with a positive sign, and Percentage of Workers that are under 30 years of age, having a negative sign. The current generation is highly associated with and influenced by technology[1]. The effect of technology on young generations is not only visible in social, economic and cultural values, but also impacts their work life. Therefore, it is reasonable to add this group of workers in the model as a control variable. The fourth added variable (Percentage of Males in the firm) was not significant. The next explanatory variable is *Time provided*, evaluating whether firms provide any time window where workers are permitted to use Internet resources for non-business purposes. The variable was significant at the 10% level in Model 3, and at the 5% level in Models 4, 5, and 6. Time Provided was positive in all models indicating that holding all other variables constant, firms that provide such time windows have a slight increase in productivity. Jain and Moreno (2015) studied the impact of organizational learning on firm's performance and they found that various organizational rewards, and recognition helps to improve firm performance. Imposing restrictions on internet usage for non-business activities also helps employees to concentrate on work which increase productivity.
Computer use policy was added in Model 4. It was significant at the 5% level in Model 4, 10% level in Model 5, and not significant in Model 6. All have negative signs. Restrictions on computer usage might be problematic, since we are living in a technology-based world and organizations have been using technology much more than in decades past. This variable became insignificant in the full model as we include other means of technological instruments in the model.

[1] http://www.academia.edu/10081152/The_Effect_of_Technology_on_the_Young_Generation

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This means having a computer usage policy has insignificant impact on labor productivity compared to other technologies. Internet Filtering was added in Model 5 and was not found to be significant.

The last variable is Cell phone usage policy at work, and this variable appears only in the full model (Model 6). The Cell phone usage policy has significant positive effects on labor productivity, which indicates that firms seeking to manage cell phone use at work with a formal policy experience increased labor productivity over firms that do not maintain a cell phone usage policy. Cell phones are ubiquitous and indispensable in our lives and those who use them tend to take them virtually everywhere Smith (2011), thus use of cell phones impact our daily lives and business environments in many ways. For example, cell phones can be distracting to employees causing interruptions, and also cause increasing security risks in some instances all of which are negatively and directly related to firms' labor productivity[2]. Spira and Feintuch (2005) document an increase in various forms of work/task interruptions including cell phone usage in the past decade, which directly or indirectly affect worker productivity.

In addition to being used for voice communications, cell phones are increasingly being used for various purposes such as text messaging, gaming, social networking, and otherwise browsing the Internet. This study empirically provides more support to the above argument that companies maintaining restrictive cell phone policies within the workplace observe higher labor productivity.

Table 2: Regression Results

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dependent: Log-Productivity	Coefficient (std. error)	Coefficient (std. error)	Coefficient (std. error)	Coefficient (std. error)	Coefficient (std. error)	Coefficient (std. error)
Constant	-3.07 (1.46)**	1.12 (1.14)	1.05 (1.00)	1.95 (1.14)*	1.48 (1.29)	1.90 (0.86)**
Lag log labor productivity	1.14 (0.26)***	0.56 (0.20)***	0.55 (0.18)***	0.46 (0.19)**	0.54 (0.23)**	0.21 (0.18)
Service	0.41 (0.36)	-0.31 (0.29)	-0.07 (0.29)	-0.40 (0.31)	-0.37 (0.40)	-0.15 (0.40)
Mining	2.21 (0.38)***	0.84 (0.46)*	0.88 (0.51)*	0.70 (0.57)	0.51 (0.57)	0.25 (0.54)
Construction	2.01 (0.41)***	1.05 (0.37)***	0.93 (0.36)**	0.04 (0.35)**	0.80 (0.34)**	0.94 (0.34)***

[2] https://www.openforum.com/articles/7-ways-cell-phones-destroying-business-productivity/

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North	-1.18 (0.43)***	-1.75 (0.42)***	-1.56 (0.39)***	-1.16 (0.47)**	-1.25 (0.48)**	-0.73 (0.44)
East	-1.30 (0.45)***	-2.11 (0.44)***	-2.04 (0.44)***	-1.76 (0.47)***	-1.54 (0.47)***	-0.98 (0.41)**
South	-1.07 (0.52)**	-1.31 (0.67)*	-1.15 (0.75)	-0.67 (0.76)	-0.65 (0.81)	-0.53 (0.63)
Years in Business	0.04 (0.01)***	0.02 (0.004)***	0.02 (0.004)***	0.02 (0.004)***	0.02 (0.004)***	0.02 (0.004)***
Percentage of White		0.02 (0.007)***	0.02 (0.007)***	0.02 (0.007)***	0.02 (0.007)***	0.01 (0.006)**
Percentage of High School Grad		0.01 (0.004)***	0.01 (0.004)***	0.009 (0.004)**	0.009 (0.004)**	0.009 (0.004)**
Percentage of Males		-0.01 (0.007)	-0.009 (0.007)	-0.008 (0.007)	-0.005 (0.007)	-0.003 (0.006)
Age under 30		-0.03 (0.007)***	-0.03 (0.007)***	-0.27 (0.006)***	-0.03 (0.006)***	-0.02 (0.006)***
Time Provided			0.58 (0.30)*	0.69 (0.30)**	0.58 (0.29)**	0.61 (0.29)**
Computer Use Policy				-0.77 (0.30)**	-0.64 (0.34)*	-0.40 (0.36)
Internet					-0.35 (0.26)	-0.29 (0.26)
Cell Phone Policy						1.08 (0.29)***
R^2	0.726	0.866	0.875	0.883	0.886	0.912

Please note: All models are Heteroskedascity checked and corrected models.
* Statistical significance at 10%
** Statistical significance at 5%
*** Statistical significance at 1%

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CONCLUSION

There has been increasing interest in research on how the Internet and cell phone use in the workplace has impacted productivity. In the last several years the productivity paradox and work/non-work balance still remain the central theme in information technology research. Several scholars provide empirical evidence as to the positive impact that information technology has on improving productivity Pilate (2004); Luque and Miranda (2000); Maliranta and Rouvinen (2006); Teo et al. (1999). Other researchers argue that allowing Internet and cell phone use in the workplace affects the work culture and can deteriorate productivity Griffiths (2010); Chen et al. (2008). Therefore, the impact of Internet and cell phone usage on labor productivity remains inconclusive.

Technology generally allows work tasks to be completed more quickly and with less incidence of error, so it is not unexpected to see the positive impact of technology on labor productivity and firm growth. But technology becomes problematic when it interferes with work tasks due to distraction. Non-work activities occurring in the workplace has increased dramatically in the last few years, particularly as social media has become popular Leung (2015). Many employers now acknowledge this issue and are proposing or implementing strategies that attempt to offset productivity losses caused by non-work activities of the Internet or cell phone usage at the workplace. This study confirms that having an Internet usage policy at the workplace tends to increase firm labor productivity. Likewise, we would expect that companies focused on the problem of misuse of technology resources will maintain a computer use policy and would tend to be more engaged with employee activities, hence a tendency to have lower levels of abuse and therefore higher levels of productivity.

Computers in the workplace lead to higher levels of productivity; however, misuse of company Internet resources and personal cell phone use is also frequently cited as being problematic Blake (2019). Recent studies indicate more than half of workers admit to using the Internet for non-business reasons while on the job Johnson and Rawlings (2003). Fully extrapolated costs in America for this lost productivity time ranges into billions of dollars annually Stewart et al. (2003). However, just as technology contributes to this time waste problem, other technology is available to assist companies in overcoming time waste activities. Employee Internet Management (EIM) systems employ various techniques that allow employers to monitor Internet traffic and to tailor how the Internet will be utilized from within the enterprise Kim (2006).

The purpose of most business analysis is to find and implement management techniques that maximize company and worker assets.

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To maximize employee productivity is the purpose of most decision making, yet the work environment is constantly changing, including technological and electronic communication improvements. In short, what worked well yesterday may not work at all today or tomorrow. Technology changes the amount of work output that is possible per worker hour, and so managers need to establish and communicate work expectations that are reflective of new work processes made possible by introduction of technology Sharma and Gupta (2003/2004).

Not establishing new norms likely leaves time gaps which will possibly encourage non-productive employee time which may include non-work related use of company computer assets.

One possible limitation of our study is the low number of respondents to our random survey. A larger sample size and more specific industry focus should lend more credibility to the results of the analysis. As well, more work is needed on the benefits for firm productivity of non-work-task time spent on electronic communication devices as this is only hinted at in our work, and the work of others.

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