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Case Study: Evaluating the use of an Electronic Messaging System in Business

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Abstract

This experience report outlines problems encountered whilst monitoring employees communication and how they were overcome. Ethical issues were raised in the recording of individual email messages. To overcome the Hawthorne effect but also to take into account the ethical considerations of monitoring employees a set of guidelines for electronic monitoring is suggested.

The value of measuring the communication processes through electronic monitoring has been shown at the Danwood Group. The analysis of email has enabled the effect on employee time to be quantified and has given some surprising results. This has led to a series of recommendations that will enable companies to make better use of email communication and increase employee productivity.

Introduction

Electronic messaging is becoming an integral part of the communication structure within organisations, but the costs and benefits are not being assessed to show when it is a more effective communication process than traditional methods. Communication is carried out in many different forms, but the common underlying motive of communication is to improve working practices and to increase efficiency.

This experience report resulted from a study of the communication methods within an organisation that retails office solutions: The Danwood Group. The investigation of the benefits of email relative to traditional communication methods forms a study within the company to establish the value of such analysis. The company expects that a basic understanding gained from this study will provide the data for communication planning and corrective actions for the problems uncovered.

Obtaining metrics of how employees communicate at work can be extremely difficult. Due to the nature of communication at work, there is not only business content in emails but also personal and confidential material that an employee would not want their employer to read. Detailed planning must take place if these problems are to be overcome. Considerations must be given in how to obtain the metrics: -

- without distorting the data
- without disrupting the employees' work
- without losing trust between the employees and employers
- having valid reasons behind gaining the metrics that both the employer and most importantly the employees can understand

The Effects of Monitoring Employees

In an early, 1927-1933, productivity study in Western Electric's Hawthorne plant near Chicago researchers discovered that their own presence affected the outcome of the research. In determining the effects of various environmental parameters on productivity, the researchers tried raising the light level, and they noted that the productivity went up. Then they tried lowering the light level, and they noted that productivity went up higher still. In this case, so long as the study was in progress, productivity increased. The term "Hawthorne Effect" was coined to define the influence of the researcher's presence

on the outcome of the study, which was their attention to the employees, increased employee productivity (Mayo, 1933).

Early research carried out by the authors showed that the employees' performances changed when they thought they were being monitored. At the time of the research users were made aware that the subject line of their email was being recorded for research purposes. In order to record the metrics a special email application 'The Danwood Mail', was written by one of the authors to analyse the users activities whilst using the package for communication. The program recorded more than just the subject line and actually recorded detailed information about each email received and sent (Jackson T.W. et al., 1999).

After only a week of monitoring, the employees using the email application began leaving the subject line blank. In some cases the subject line was only left blank when the email was non-business related. Monitoring clearly influenced the employees in making them find ways of disguising their activities and in turn affected the communication study.

Choosing Non-Intrusive Monitoring Equipment

There were numerous ways the email metrics could have been recorded. The most obvious way was to observe the employees at their desk, recording the various activities by capturing them on a camcorder. Another possibility would have been to have an actual person discretely watching the employee from a distance. These methods would have probably produced distorted results due to the employee knowing they are being monitored through the constant presence of the monitor (Mayo, 1933). The most appropriate option was to use computer software to monitor the employee. Many of the software monitoring applications considered had a number of restrictions, such as, lack of reliability, no access to the monitoring source code, inappropriate system tray icons, being too slow or having excessive amounts of media required to record an employee at work for a full day. It was decided WinVNC (Cambridge, 2000) would be used with a video recorder because it was a stable product with access to the source code. The original WinVNC program was modified slightly by one of the authors to remove the icon shown in Figure 1 from the system tray so the employees would not know when they were being monitored.



Figure 1 – Shows the WinVNC icon that was later removed from the system tray

Building the Trust

To a majority of employees within the workplace monitoring their activities is not acceptable. It can be regarded as an intrusion into personal privacy and, potentially, through its use, the employees could lose their jobs if the company does not approve of their activities. This type of thinking by the employee is potentially damaging for the company and will hinder productivity if lines of communication are restricted through being monitored. In the case of the Danwood Group all employees had signed a staff agreement that they can be monitored, but nevertheless there is an ethical issue at stake and it is important for employers to build trust between themselves and the employees.

One possible resolution of the ethical problem is to employ a third party to carryout all monitoring of employees, with employees being made aware that no individual results will be disclosed to management and employees being informed of the benefits that monitoring will bring to the workplace.

This was the solution used at the Danwood Group with the monitoring carried out by Loughborough University. Management were given the overall statistics but no information on any one individual.

Summary of the Results

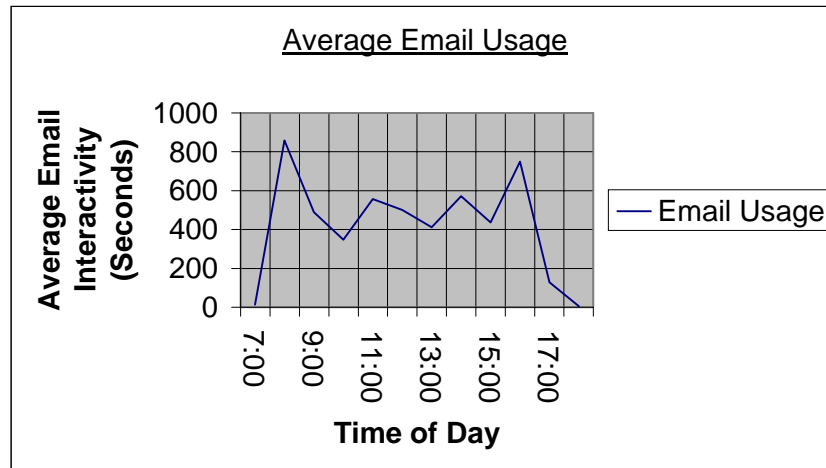


Figure 2 – Email usage throughout the day

(The graph is measured in email interactivity, where email interactivity is classed as a user reading or composing a message including reply, reply all and forwarding).

The monitoring of the email gave some interesting and surprising results. The commonly held view that the main advantage of email is that it allowed users to manage their time by accessing email when it is most convenient with the minimum interruption to other daily activities. It was found, however, that most employees had their email application configured to check email every five minutes, and to then give an audible and visual interrupt if incoming mail is received. 70% of employees would then react to the interrupt by reading their email within 6 seconds of the interrupt. 85% of employees reacted within two minutes. On average, the recovery time taken to resume normal activity after completing their email activity was 64 seconds. This showed that although the disruptive effect of email is not as great as the interruption from the telephone the disruption is still significant (DeMarco T and Lister, 1999). For example, the average time lost over a whole year for non-business email, which accounted for 43% of the email recorded, would be around two working weeks.

It was also found that email activity (reading and composing emails) had two peak periods in the day, at the start and end of the working day, shown in Figure 2. This suggests that employees could minimise the interruption to other work by checking email less often, concentrating their email activity mainly at each end of the working day. The benefit to the company is that it can now consider giving training and issuing guidelines to employees to make more efficient use of their time when using email.

Conclusion

To overcome the Hawthorne effect but to also take into account the ethical considerations of monitoring employees a set of guidelines for electronic monitoring is suggested:

- 1) An independent party should carry out any electronic monitoring
- 2) Monitoring tools should be stable and not cause distribution or raise suspicion of being monitored
- 3) After monitoring the employee's should be told of their results and also told the results will not be individually disclosed to the management or other employees within the company
- 4) The monitoring should be undertaken with the aim of mutual benefit for all employees by providing information on ways to work more effectively – not as a means of spying on individuals.

The value of measuring the communication processes through electronic monitoring has been shown at the Danwood Group. The analysis of email has enabled the effect on employee time to be quantified and has given some surprising results. This has led to a series of recommendations that will enable companies to make better use of email communication and increase employee productivity.

Bibliography

Cambridge, A. T. L. (2000) AT&T Laboratories Cambridge, <http://www.cam-orl.co.uk/vnc/winvnc.html>.

DeMarco T and Lister, T. (1999) *Peopleware. Productive Projects and Teams 2nd Ed.*, Dorset House Publishing Company, New York.

Jackson T.W., Dawson R and D, W. (1999) In *INSPIRE - Training and Teaching for the understanding of Software Quality*, Vol. 4 Crete, pp. 167 - 178.

Mayo, E. (1933) *The Human Problems of an Industrial Civilization*, New York: Macmillan.