

QUANTIFYING THE EFFECTS OF MONITORING SOFTWARE ON EMPLOYEE PRODUCTIVITY AND SATISFACTION

Rareș-Valentin DRĂGHICI¹³

Vlad MOSESSOHN¹⁴

Radu-Alexandru IONIȚĂ¹⁵

Vlad-Gabriel LUCA¹⁶

Cătălin TUDOSE¹⁷

Costin-Anton BOIANGIU¹⁸

Abstract

This paper will focus on the effects of different types of monitoring software. We will use a survey to gauge the satisfaction of employees in various working environments. The data aims to differentiate between types of monitoring of varying invasiveness to study each of their effects on productivity and employee satisfaction. We will ask them about their perceived increase or decrease in productivity and their satisfaction overall. In this paper, we tried to make a connection between the overall satisfaction and productivity of an employee and the use of monitoring software. Overall, based on the results of the survey, we will conclude that intrusive employee monitoring systems not only decrease self-perceived productivity but also negatively affect job satisfaction and job retention.

Keywords: software monitoring, employee monitoring, time tracking, productivity, privacy, project management, software development, ethical monitoring policies

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1. Introduction

Employee monitoring means the surveillance of worker activity. Most often, companies will use this kind of monitoring for different reasons: to prevent access to sensitive

¹³ Student, University Politehnica of Bucharest, draghici.rares212@gmail.com

¹⁴ Student, University Politehnica of Bucharest, vlad_mose@yahoo.com

¹⁵ Student, University Politehnica of Bucharest, radu.ionita0702@gmail.com

¹⁶ Student, University Politehnica of Bucharest, lucavlad70@yahoo.com

¹⁷ Lecturer, PhD Eng., University Politehnica of Bucharest, catalin.tudose@gmail.com

¹⁸ Professor, PhD Eng., University Politehnica of Bucharest, costin.boiangiu@cs.pub.ro

information, to prevent illegal actions and breaking internal policies, monitor and recover lost important communication, but the most widely used is tracking employees' results. [1]

The use of employee monitoring, in general, will affect the worker's performance and satisfaction. Organizations use various methods to monitor their employees, among which are software monitoring, e-mail monitoring, telephone usage, video surveillance, location monitoring, and keylogging. Largely used inside companies are software monitoring and keylogging.

Due to the controversy of this topic, employee monitoring will cause a lot of conflict with employee privacy because that monitoring may also collect their personal data and information. The employer wants to ensure the best for the company and the employees want to maintain their privacy. When a company gives a computer to an employee, the company would like to protect its essential information, while the employee should not feel alienated. This balance can be obtained through education and communication [1].

Most organizations argue that employee monitoring is just a productivity tool, but people are more concerned about this argument because their privacy is now invaded. The main downside of this kind of surveillance is that it can have a strong negative impact both on work productivity and employees' health. It was demonstrated in a research paper that there is a connection between employee monitoring and psychological and physical stress [2]. In the most extreme cases, it was found that invasive surveillance and monitoring may even trigger other physical disorders, such as carpal tunnel syndrome [3]. Furthermore, when people are exposed to those levels of continuous stress, they may get sick more often and do not heal so quickly, and this generates work absence and less productivity for the company [4].

2. Previous work

Another article that uses surveys to analyze employee attitudes towards monitoring is "Exploring Privacy and Trust for Employee Monitoring" [11]. They found that a control-oriented organizational culture conducted to communication privacy turbulence in communication privacy management (CPM). This had a negative impact on employees trusting the monitoring policies. The results they produced provided insights into why employees feel psychological stress when they need to be monitored.

As in other previous research findings, control-oriented organizational culture is facilitating and supporting information security practice [12]. However, orientation to controlling and coercing the working environment may lead to poor employee communications. Their study demonstrated that employees feel under psychological stress about monitoring if there was no previous agreement about the exact expected privacy limit.

Another survey was performed on employees under employee monitoring and it showed that privacy limits are in most cases set by companies [13]. This was described as "asymmetric power". Employees decide about employee monitoring practices and internal policies [10]. Petronio S. suggested that employees often prefer to accept a job under monitoring instead of trying to change the monitoring activities of the company [14].

3. Ethical and legal issues of software monitoring

The whole employee monitoring topic is situated in a gray area, especially software monitoring, yet more and more people are questioning whether it is effective and ethical and arguing that companies “must create an employee-friendly environment of accountability and transparency to operate effectively” [5]. In general, employees desire as much freedom as possible without any kind of monitoring or surveillance, but often this situation is impossible to meet because both employees and the organization are trying to protect their personal interests.

Moreover, companies often use ethical monitoring policies, and the employee has to accept that the employer may decide about a set of certain rules. For instance, in Canada, invasive monitoring is mostly forbidden, meaning that a company is not allowed to read an employee’s emails and messages unless it is absolutely necessary for the organization, leaving no other choices [6]. In American jurisdictions, the legislation agrees on employees’ privacy at a considerably lower level [10]. In Maryland, all parties involved in a conversation need to provide their consent before the conversation can be recorded and used. Furthermore, in the state of California, before starting the recording of a call, a message should communicate to the caller that the conversation is recorded, or it must be a periodical beep repeating the same thing.

All these new and adopted rules are showing the main statement, which is that employee monitoring, especially with certain software, is very controversial and questioned. Lawyers consider that organizations may avoid their responsibility for monitoring employees’ online activities if they make it clear that employees should not expect any privacy while using the company email and communications systems [1]. The developers of the employee monitoring software recommend that a worker should give his written agreement before the company starts to monitor him to avoid any legal issues. Recently, forced by the new rules, employers have changed the way employee monitoring protocols are working in their company.

Some scholars support the idea that employees may not have a “reasonable expectation of privacy” as their role is to grow the company business [8,9]. The opposite point of view is that “it is not always possible to distinguish clearly which of an individual’s activities form part of their professional life and which do not,” [15] and thus, employees may expect reasonable privacy in the workplace.

4. Software monitoring methods

Even when discussing software monitoring exclusively, we can distinguish between invasive and non-invasive options. While some methods can be considered part of standard time management, others can be seen as snooping more than anything [2]. These methods are used to prevent employees from using the company's resources for non-business tasks.

There exist many software tools designed to monitor employees and some are part of project management suites. These alternatives are easier accepted by the employees, as being non-invasive. Other options tend to have similar utilities to malware and are used to either track online activity or to interfere with bandwidth.

4.1 Non-invasive monitoring software

Rather than monitoring employees, non-invasive methods tend to help managers and overseers to organize the workflow and impose deadlines. These methods use time tracking to reduce idle time and to check failed deadlines. The severity of monitoring is up to the manager who can be as strict as he deems necessary.

The tools used are project managers and their utility is similar to traditional non-software monitoring methods. It is normal to have one's work checked by their superior, or to be given a specific time-frame for a task and to be questioned when you fail to meet deadlines. Such practices are seen as something to be expected and should not be stressful or unfamiliar.

The most popular example of non-invasive monitoring software is Jira, which is a project management tool to help teams organize and monitor their activities. Starting as a bug tracker, Jira has now various usages, including here management of software development, requirements, and test cases. A user may open issues, then the person assigned to the issue can estimate his work, track working hours, comment, and also tag other teammates to be synced and update their progress. Other non-invasive monitoring software applications are Slack, a project manager with a focus on communication, Toggl, a time tracking, project planning, and hiring app that aims to improve productivity while reducing stress, Clockify, a time tracking software, and timesheet app that lets you track work hours across projects and ClickUp, a project manager that aims to compete with Jira.

4.2 Invasive monitoring software

When it comes to invasive methods, employees may see them as being more akin to malware rather than a normal part of work supervision. There are numerous solutions – both software and hardware – that may monitor various activities. Generally, they log keystrokes typed, accessing files, applications, and websites, installation of software, Internet connections and data exchanged, chats, and emails. Keystroke logging is a very invasive type of monitoring, arriving at detailed reports about every keystroke on the keyboard. Companies can install hardware devices that track the activities on the laptops, even without the employees' knowledge. This technology used is very modern and stealthy. [1]

There are software products created to interfere with bandwidth, SmartFilter from Secure Computing slows down the download of large MP3 files to frustrate the user and make it reduce and even avoid these downloads. [4]

5. The proposed approach

To conclude, we first need to collect data. To do this, we have created a survey using Google Forms that focuses on the following key aspects of our study:

- The type of software that was used to track employee activity (time tracking software or employee monitoring software)
- How intrusive the software is (if used)
- How productive the employee feels at work
- How time tracking/employee monitoring affects productivity (if used)
- How satisfied the employee is with their job
- How does time tracking/employee monitoring software affect the job satisfaction
- How satisfied the employee is with their job income and if they are willing to accept the use of an intrusive time tracking/employee monitoring software if there is sufficient monetary compensation
- If the use of an intrusive time tracking/employee monitoring software led to the employee leaving or thinking about leaving their job
- Personal details (non-identifying), including age range, job experience, gender, the work field

There's a well-known fact: how you design your survey affects the answers you get out of it. When it comes to our rating scales, we went with the most commonly used ones, the 1-5 scale (Likert scale) and the dichotomous scale (yes or no), depending on the question's context. This allows for greater flexibility in designing our survey, and we believe it was the best approach for our analysis [7].

The Likert scale was designed to provide quantifiable precision for the answers and gives enough resolution for data analysis and classification. Comparatively, the dichotomous scale is preferable in case the respondent cannot provide precise quantification of the answer for questions that are harder for the respondent to quantify precisely.

6. Study results

After running the survey for more than a month, between the 22nd of December 2021 to the 9th of February 2022, we have gathered a total of 23 responses, which were acquired by sending this study on the main social platforms of Politehnica University of Bucharest, as well as friends and relatives that are currently working and had some background experience regarding our paper.

The main detail this study is covering represents the fact that all of the participants have been employed because if they weren't, they couldn't have the experience needed to answer the questions.

From the personal details section, we can get a general overview of the people who have answered the questions related to this study:

- 100% of our respondents are between 18 and 24 years old. This was to be expected, given that the survey was shared almost exclusively with students.
- We see an almost even distribution of male-female students: 56.5% male, 43.5% female.
- The overall job experience did not exceed 3 years. A majority of participants, 52.2%, have less than one year of work experience, while the rest, 47.8%, have between 1 and 3 years of work experience. Again, we anticipated this result, as most of our respondents are 4th-year undergraduate students or are studying for a master's degree.
- A vast majority, 78.3%, of our participants work in the Science and technology sector. The rest are evenly distributed between Sales/Marketing and Law. Empirically, we believe this adds value to our study, as employee activity and task monitoring software systems are actively utilized in the IT sector.

To conclude, we utilized a combination of the response charts provided by Google Forms, as well as a cross-question analysis using Microsoft Excel.

On a scale from 1-5, how satisfied are you with your current job?

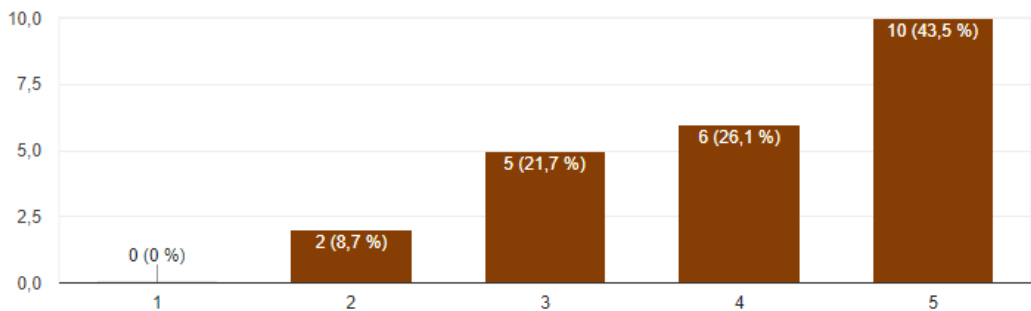


Figure 1 - Overall job satisfaction

As the Covid-19 pandemic has proven to be life-changing, especially when it comes to jobs, most of the people are working from home. This aspect is proven by the graph generated by our survey, reflecting the point that working remotely satisfies the vast majority of respondents, with more than 69.6% of them being satisfied. Only 8.7% are indeed unsatisfied, and 21.7% are between the two options.

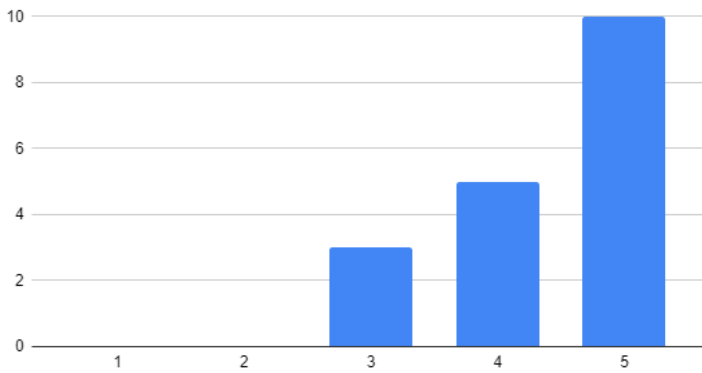


Figure 2 - Job satisfaction in the IT sector

The IT sector, and also the vast majority, representing 78.3% of the participants, are satisfied with their job, presenting the advantage of working from home.

On a scale from 1-5, how satisfied are you with your current income?

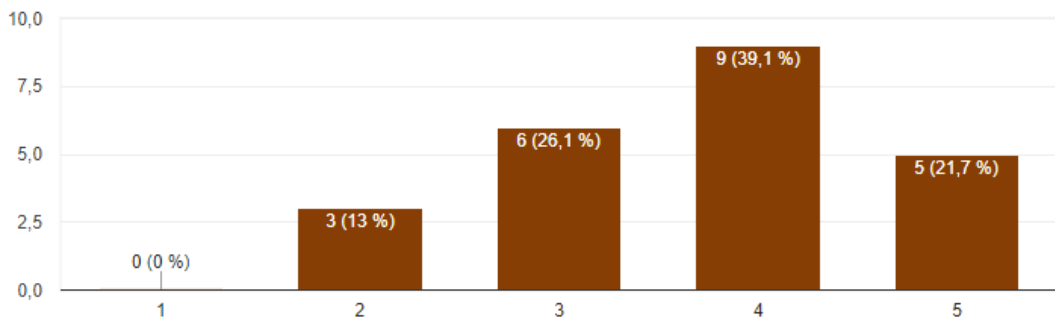


Figure 3 - Overall job income satisfaction

There isn't any employee that is fully unsatisfied with his income, and the vast majority is indeed satisfied with their salary, consisting of over 60.8%.

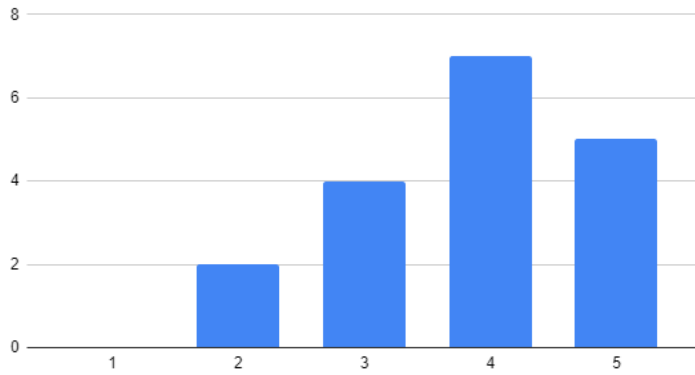


Figure 4 - IT Sector job income satisfaction

Based on the data filtered on the IT sector, the respondents are pleased with their salaries, with only 2 out of 18 being unsatisfied.

On a scale of 1-5, how productive do you feel at work?

This was the overall response:

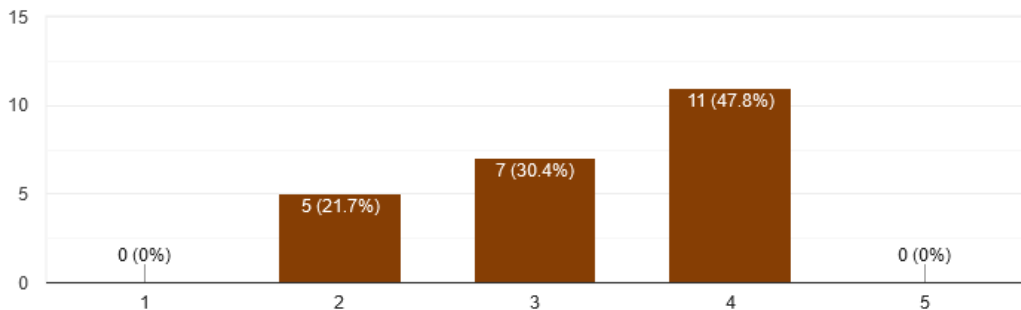


Figure 5 - Overall self-perceived productivity

No responses fall on the extremes: while 47.8% of the participants felt they were quite productive at work, none responded with either very productive or not productive at all.

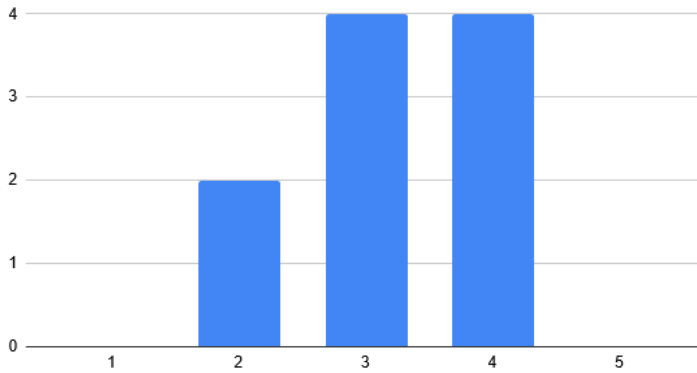


Figure 6 - Productivity if employee monitoring is used

Where employee monitoring is used, we get the following results for self-perceived productivity: Mean 3.20, Mode: 3 or 4. And for no employee monitoring: Mean 3.27, Mode: 4.

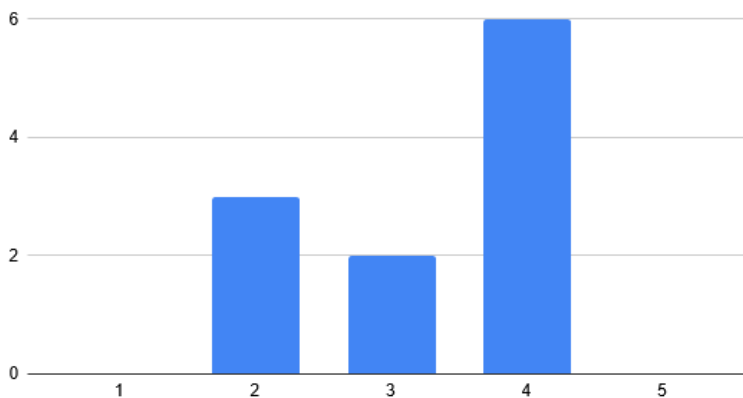


Figure 7 - Productivity if employee monitoring is not used

From the data we have collected, there is no clear winner. However, no employee monitoring seems to have the edge with a slightly higher mean self-perceived productivity, and with more participants answering 4 (higher than average productivity).

Does your current employer or any of your previous employers require the use of time tracking software on company computers? (ex. Jira)

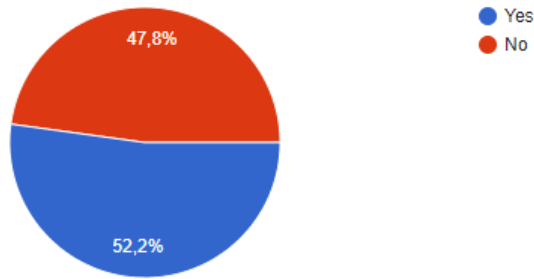


Figure 8 - Time tracking/employee monitoring software usage among employers

The current graph displays the requirements of the employers, most of them having the desire for an application that tracks the use of time, making sure that the employee is indeed working the number of hours he has been signed for.

If your company requires the use of time tracking/employee monitoring software, does it improve your productivity?

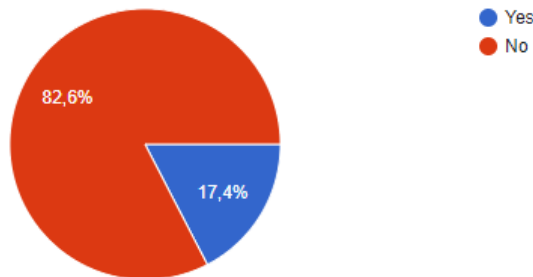


Figure 9 - Effects on self-perceived productivity

The addition of monitoring software is stressful for the employee, and this is demonstrated in the following chart, with 82.6% of the participants considering that it doesn't improve their productivity, but the opposite. Although a good monitoring software could keep things fair, track your productivity rates, and can create a positive standard for what's appropriate at the workplace, it is a privacy concern and it can also affect the overall trustiness of the worker.

If your company requires the use of a time tracking/employee monitoring software, how intrusive do you feel they are on a scale from 1-5?

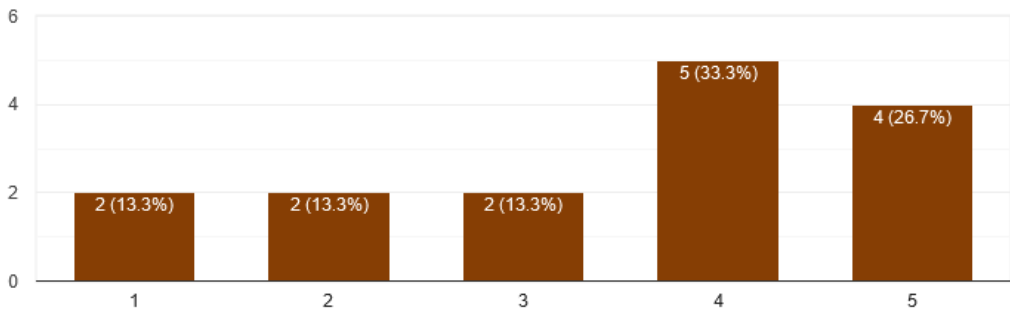


Figure 10 - Intrusiveness of time tracking/employee monitoring software

This graph paints a disconcerting picture. A majority of our respondents (60%) felt that the employee monitoring software their company utilizes is intrusive. The most common answer was 4 out of 5, with only 13.3% percent of participants answering that the software is not intrusive at all.

If your company requires the use of a time tracking/employee monitoring software, would you be more productive if it was removed?

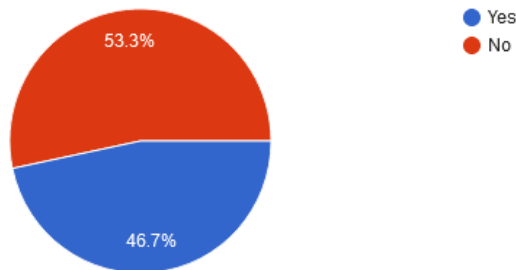


Figure 11 - Productivity increase after removal of time tracking/employee monitoring

This is an almost even split, with a delta between answers of only 1 participant.

If your company does not require the use of a time tracking/employee monitoring software, would you be more productive if it were added?

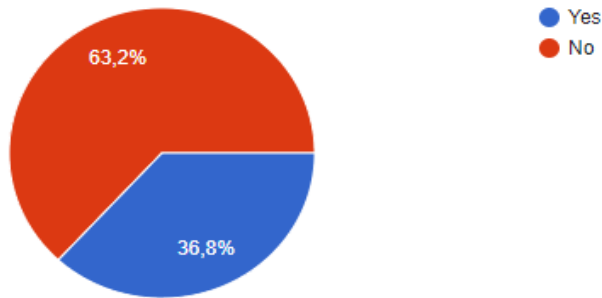


Figure 12 - Productivity increase after introducing time tracking/employee monitoring

As expected, 63.2% of participants considered that the productivity of a worker increases when they have the trust of the employee and also there isn't any more stress added besides the already existing one, while the rest, 36.8%, considered that it will not be more productive.

If your company requires the use of a time tracking/employee monitoring software, do you feel that they negatively affect your job satisfaction?

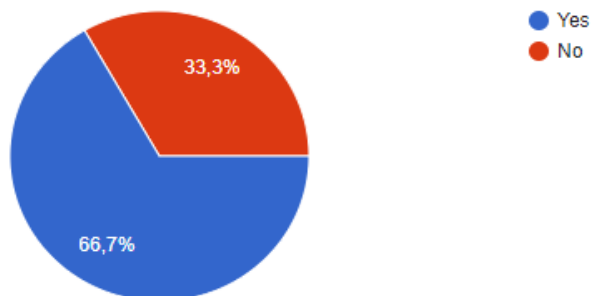


Figure 13 - Negative effects of a time tracking/employee monitoring software on job satisfaction

This graph pictures the overall invasion and privacy uncertainty of employees that is caused by the addition of these monitoring software applications, especially when they are not well implemented, and also inverts the percentages of the previous question.

If your company does not require the use of a time tracking/employee monitoring software, would you accept a pay raise if such a system was implemented in an intrusive manner?

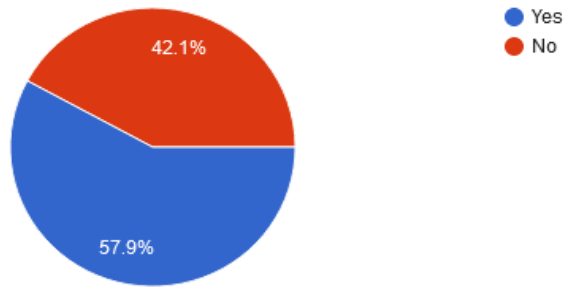


Figure 14 - Acceptance of pay raise on implementation of intrusive monitoring software

A majority of respondents would accept a pay raise over an intrusive monitoring solution. However, let's look at this based on perceived income satisfaction:

- If the respondent has a high perceived income (answered 4/5 or 5/5 on the perceived income question) then:

- 6 would accept a pay raise
- 6 wouldn't accept a pay raise

- If the respondent has a medium perceived income (3/5 on the perceived income question) then:

- 4 would accept a pay raise
- 2 wouldn't accept a pay raise

- If the respondent has a low perceived income (answered 1/5 or 2/5 on the perceived income question) then:

- 1 would accept a pay raise
- 0 wouldn't accept a pay raise

We can see a correlation between a lower perceived income and a higher willingness to accept a pay raise over a non-intrusive work environment.

If you have ever been in a situation where a time tracking/employee management system was integrated in an intrusive manner, did you leave or did you think about leaving your job?

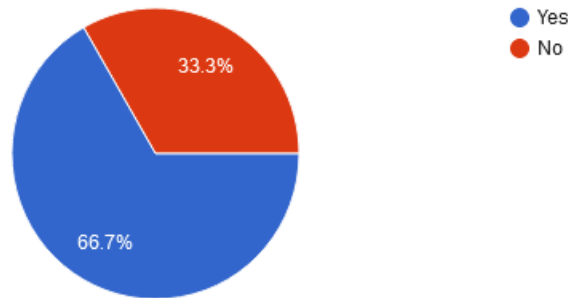


Figure 15 - Employee retention when invasive monitoring measures are utilized

This shows that intrusive monitoring software directly affects employee retention. People value their personal freedom during working hours and are willing to switch jobs because of that.

As a preliminary conclusion, in general, the IT sector is more satisfied regarding the income and the job in general in comparison with the other sectors which present choices that are on extremes.

Regarding the monitoring software and overall tracking of time use, people tend to enjoy their freedom and reject additional stress, so this additional condition, the applications, affects employers.

7. Conclusions

Overall, we have concluded that intrusive employee monitoring systems not only decrease self-perceived productivity but also negatively affect job satisfaction and job retention. As such, employers must always find a balance: a system based solely on trust and no monitoring will surely lead to some employees abusing it, doing little to no work during their working hours. On the other extreme, systems that actively monitor employees not only are on the verge of morality and legality but also lead to the effects described above. A middle ground must be reached, with management utilizing software to provide a lenient and non-intrusive approach to ensure that employees are doing their assigned activities without invading their privacy or increasing their stress levels.

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