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The Platformization of Worker Surveillance: Materialities and Imaginaries in Teramind and Time Doctor

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This article assesses surveillance imaginaries and materialities imposed through the Time Doctor and Teramind user activity monitoring platforms. To conceptualize bossware, I build on the concepts of platformization, surveillance, and automation, which act in the construction and operation of the features of such platforms and their imaginaries. I observe how communication practices—investigated based on Bucher's "technography" method—are revealed both in the construction and the presentation of features, actively participating in the composition of a monitored and controlled environment aimed against workers. Technography makes it possible to remove surveillance platforms from the black box by observing what is possible from data inputs and outputs and the possible imaginaries from those who build them and those who operate them. In this way, from a perspective that seeks elements and actions of work control that are present in the first studies of scientific management in the early 19th century, I hereby present a more contemporary view of the possible practices from the platformization of surveillance in the workplace.

Keywords: platformization, surveillance, automation, technography, workplace monitoring

The end of 2019 was marked by the news of a virus that would come to cause the biggest epidemic of the century. Almost overnight, COVID-19 caused millions of workers worldwide to be displaced from their offices to their homes. These new conditions forced a remodeling of space and a reconfiguration of infrastructure. Even by 2017, as Ajunwa, Crawford, and Schultz (2017) note, freelancer and remote worker contracts had significantly transformed labor relations. Managements were encouraged to carry out systematic surveillance actions on their workforce, which was far from the eyes of employers. In addition, because they did not work in the same place, there was less trust developed when compared with traditional employer-employee relationships. In 2020, there was a notable increase in companies seeking solutions to enhance the productivity of remote workers, particularly in industries focused on hiring, and with a growing emphasis on autonomy from direct supervision.

"Bossware," installed on computers or smartphones intended for work, and providing oversight of remote workers, offered a solution to these new conditions. The biggest leap occurred between February and March 2020, the very same time when countries across the world instituted lockdown policies. The need

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to know if workers are really using their time on work activities is a core motivator; other concerns include the need to know about the optimal use of time, whether workers are working throughout the day, and if work equipment is being used for personal use (Digital.com, 2023).

In some senses, bossware continues long-standing logics within capitalism. From Ford's serial production line to Taylor's (1911) time and motion studies, the goal has always been to ensure maximum profit through the reduction or elimination of unnecessary processes or distractions. By measuring routines against a time control and a production count, it becomes possible to measure which workers have been productive—and which have not. Fuchs (2011) directly relates surveillance as an activity linked to the collection of information for purposes of domination. Workers consider their subjection to surveillance to be proof of their value to the company but also aim to create metrics that are favorable to themselves (Fuchs, 2011). In the factories of the Second Industrial Revolution, certain groups of professionals were assigned to carry out such controls. Through notes, spreadsheets, calculations, and constant observation, records were made and analyzed to enable conclusions.

The performance of this collection and analysis model was possible in mechanical, repetitive activities, in which workers were assigned to the same activity for long hours, with movements that were defined and did not require great cognitive or creative capacity. However, new work models are flexible and adaptable, challenging existing understandings of work measurement. In this sense, a manager's watchful eye on each person's activities becomes obsolete or very difficult to execute, thereby requiring new models and solutions to ensure productivity at work.

The platformization of surveillance at work, as discussed below, consists of the application of elements that are specific to the design of the platforms, coupled with intense and sophisticated observation processes that aim to capture information from the environment, analyze and understand the scenarios and, where necessary, intervene on behalf of the stakeholders. In the first section, I conceptualize bossware, showing how these three concepts of platforms, surveillance, and automation can come together. In the second section, I explain my selection of Time Doctor and Teramind as platforms and "technography" as an appropriate method for this investigation, one that helps us to make accessible and understandable environments that involve a dense layer of programming logic. Finally, I carry out an analysis of the materialities and imaginaries that are present in these bossware products, highlighting differences among them and showing how they construct a platformized surveillance environment.

Situating Bossware

Bossware programs comprise technological solutions that are used to monitor workers while they dedicate their time to the company. These executable algorithms track human-machine interaction to extract data, process these, and transform them into information for analysis. The interaction between the platform and the worker can be active and conscious—in which the person is aware of and has some control over the start and end of the monitoring period—or invisible—in which there is no awareness of the monitoring process and no control over the limits of data collection.

These solutions hark back to already existing practices of monitoring and surveillance of work as described by Taylor (1911) in the scientific management theory of time and motion. Nevertheless, with emerging innovations in computing such as datafication, data extraction, and data fabrication, workplace surveillance practices have developed certain characteristics to meet the new challenges of monitoring work, which I will discuss below. They are (1) standardization; (2) computational processing; (3) infrastructure; (4) platform surveillance; and (5) process automation.

First, standardization, in the style of a framework (Wood & Monahan, 2019) is possible by following the specialized work model itself. By predefining the performance and action of each worker, electronic equipment is able to capture specific information about each activity. With greater knowledge about a worker's modus operandi, different patterns are generated, enabling computational models to operate in this environment. The framework specifies what is expected in different activities, denoting an abstraction of the ways of managing each activity and shaping them according to certain expectations. The supervisor, once focused on timing each movement to maximize efficiency, has transformed into an algorithm equipped with sensors and data inputs. This algorithm now reads and interprets the environment, generating insights about ongoing activities.

With the data collected, computational processing acts as a way of producing knowledge about the information obtained. Guided by a belief in explaining the environment through data (Beer, 2019), marketers promise to guide, achieve, resolve, and reveal situations in a better, more efficient manner. To achieve this goal, captured information is transformed through processes into results. The move from a manual analog analysis is not just a savings in time but rather represents the introduction of a new logic in the form of algorithmic rules or machine learning techniques.

Appropriating Poell, Nieborg, and Van Dijck's (2020) description of platforms, it is possible to see that platforms are part of and even require a series of infrastructures to act and operate. In this sense, based on application programming interface (API) calls, bossware programs allow other services to connect and be connected to theirs and provide inferences regarding their information, enrich the existing ones, conduct external processing in an efficient manner, and present results from the logic of other partners. In addition to software infrastructures, hardware infrastructures act as important points for the collection of data in increasingly precise and wide-ranging ways. What is collected, the storage location, and the possibilities of understanding this information are also part of these infrastructure agreements given that once such devices are installed, the remaining process should take place automatically. Thus, bossware as a platform differs from the supervisor as the accuracy itself can be improved through remote updates, device changes, or even new algorithmic analysis of third-party applications.

As with actions based on algorithmic logic, bossware is based on the continuous observation of workers, characterizing a scenario of platformized surveillance. The logic of platforms, whether through social media, website curation, delivery services, or drivers, is based on the systematic collection of user information (Manokha, 2018; Srnicek, 2017a, 2017b). Platforms extract information both actively, from user-entered data, and passively, from various interactions such as likes, dislikes, views, skipped videos, and other features.. In bossware, observation is characterized both by the existence of behavior and by its absence. In the former case, typing speeds, mouse movements, changing screens, applications used, and time spent are used to characterize what is "work" and what is not. However, the absence of these inputs,

such as when a laptop does not receive any interaction, may also symbolize an absence of work. For Wood and Monahan (2019), this form of observation is not new but rather a transformation of existing practices placed into a logical infrastructure allowing information to be categorized, as I will show later, to define what is expected, what is productive activity, what is risky behavior, and even what is not a work-related activity.

Data obtained from these interactions vary in complexity. Collection may be simple, such as mouse activity, software used, websites accessed, times the computer went idle, and even screen recordings. This information aims to clarify whether or not there is activity on the work device and what tools the worker is using. More advanced solutions, however, capture more complex data, searching for deviations that may compromise data—intentionally or otherwise—and behaviors that are not in accordance with company policy.

Finally, contributing to the new operating logic that promises greater efficiency, speed, and agility in decision making, automated processes provide bossware with the necessary features to operate with a minimum degree of human supervision, acting (and revealing itself) only in certain moments. As Casilli and Posada (2019) state, the interoperability of the platforms allows actions taken automatically to reduce the need for human intervention from the coordination and access to its ecosystem (database, third-party applications, and hardware and software infrastructures). Thus, after the entire process of data collection, storage, and analysis, the knowledge produced can serve both to produce reports and as inputs to activate triggers that automatically activate different features. This output of information can either be in the form of an alert (for the manager or for the worker) or more emphatic measures such as screen recording and even blocking access. The automation of processes allows them to be agile, immediate, and scalable while also being predictive and supported by machine learning algorithms. They are thus able to foresee risky behaviors (leakage of intentional or unintentional information; noncompliant behaviors) and act even before something happens.

In this sense, bossware behaves like platforms in the way that it transforms the existing practice of accompanying, monitoring, auditing, and acting on labor logics, operating in a silent, agile, systematic way, and interacting with different stakeholders at the same time. Thus, the existing changes that affect workers range from the immediacy of actions (collection, processing, action) to the omnipotence and omnipresence of these devices. The different solutions on the market, in turn, also contribute to this change of perspective as each platform exists to serve a specific market niche: Remote workers, workers operating with confidential information, outsourced workers, and even on-site workers, as well as those who are paid per hour worked. These workers make it necessary to act in different ways, but which become profitable, as the platform allows scaling the business model of the companies that develop them.

Platform studies conducted by Poell et al. (2020), among others, address the dynamics of such services and the infrastructures and relationships required by them to achieve their goals. Van Dijck (2021) states that the interdependencies between platforms and the wider system are tree-like, consisting of roots, trunks, branches, and leaves. These insights help us understand how bossware platforms fit into broader ecosystems, based on elements such as (1) a process similar to industrialization, in which it transforms the society in which it is inserted; (2) being powered and governed by data; (3) dynamic processes of constant evolution, driven by human and nonhuman stakeholders; (4) integration of data among other platforms, defined by intersectoralization; and (5) the possibility of refactoring existing data to create new scenarios. By combining these elements, already existing attributions and agreements are transformed into a dynamic

that is capable of efficiently managing activities and scenarios based on extensive data processing provided by computational processes.

Methodology

To select potential candidates for bossware research, I focused on which platforms were receiving searches on Google. Through Google Trends, I entered the term "Employee monitoring software" for the year 2020 and began a search for different solutions that appeared both in main topics and trending topics. The first platforms to appear in the results are the following: Time Doctor (with a sudden increase), Veriato (with an increase of more than 500% compared with the previous period), and Teramind (with more than 70% more searches than in the previous period). Based on reports from other websites (Morrison, 2020) supplementing the results of the search, it could be observed that these and other platforms saw an increased demand "from new and returning customers during the coronavirus work-from-home boom" (para. 9). Two of the three products from Google Trends results (Time Doctor and Teramind) were featured in the report: Time Doctor had more leads in a single week than in the entire previous quarter, and Teramind had a three-digit percentage increase in new leads since the beginning of the pandemic (Morrison, 2020).

The two platforms have different niches. According to the data I collected from GetApp,[1] Time Doctor is used in advertising, education management, hospitals and health care, higher education, and graphic design, among others, and according to information from Capterra (2023), in companies with up to 50 employees. Teramind's five main markets are real estate, technology and information services, advertising and marketing, software and construction, with an emphasis on network security accounting, and banks, and according to the Capterra (2023) website, it is used in teams of up to 50 employees. While Time Doctor seeks to increase productivity and facilitate payment per hour, Teramind makes it possible to understand each worker's performance to avoid unexpected behavior. Both solutions stand out not only due to their significant increase in interest from potential clients but also for their distinct operational approaches in managing work.. Based on these choices, I intend to demonstrate the scenarios in which the platformization of surveillance at work collaborates to become not only a surveillance and monitoring tool but also a tool for the production of value and optimization of processes, mainly managerial, which aim to understand, control, and modulate relationships and the work environment.

The opacity and invisibility that make it possible for bossware to track employees also make it hard for researchers to study it. Initially, the idea was to interview workers who had undergone work-monitoring situations as well as to collect information from people involved in the production and sale of monitoring platforms. But this vision met with many obstacles, with individuals fearing to discuss the subject and having scarce knowledge about how these solutions work. Moreover, platform developers did not respond to inquiries.

If these platforms could not be studied from within, could they be studied from without? "Technography," a method developed by Bucher (2018) provided the possibility of investigating the

[1] Data were collected between July 1, 2018, and August 31, 2022, using Web scraping via the GetApp website, which looked for reviews of both platforms. Data was grouped by sector information, available in some comments.

sociological elements that are present in the construction of platforms. Technography unveils technocultures through the exploration and investigation of artifacts, the ways they are used and appropriated, and the relationships they create both with the environment and with people. In this context of the social inscription of the algorithm in the form of a nonhuman actor, Bucher (2018) provokes the search for "algorithm worldviews" in which their different logics and practices reflect the values and assumptions present not only in the development but also in the social reflection of what they entail (p. 61). Thus, technography involves examining how technology—including black-box systems, algorithms, biases, and codes—presents itself to us, allowing for observation, capture, inference, and analysis.

For instance, while algorithms are often seen as hidden "black boxes," it is in the power relation that the algorithm shows itself. As Deleuze (1992) and Beer (2019) show, power is exercised and presented in moments of checking the information collected against the expected behavior. When this behavior deviates from what is expected, the algorithm leaves its invisible mode and begins to present itself in different ways, whether through an alert, an unavailable service, a failure, or a refusal of access. Users, in turn, observe during these moments of algorithmic activity the emergence of a force that was once hidden or attempted to be concealed (though not always successfully) exerting its influence upon them, as we will delve into later.

Technography offers empirical action on the source code to which we do not have access. In general, the method stresses the material elements of an object present in the interface, features, and triggers of the platforms and in the imaginaries created from the elements that show the relationship between people and the platforms. These imaginaries emerge from the developers who create the product, the marketers who persuade new customers, and the clients who adopt and deploy it.

In this research, technography was carried out by analyzing platforms based on materials available in their digital channels such as websites, blogs, or videos. These texts, screenshots, videos, and PDFs aimed to highlight characteristics considered important, distinguishable, and sufficient for their existence and need in the market. On platforms that allowed audiovisual content, I had access to training materials and explanations of key features. Opinions and reviews by professionals (who were not developing these products) provided a more impartial assessment of the strengths and weaknesses of these solutions as well as a vision of how each intervenes in employer/employee relationships.

Demo versions, offered by both Teramind and Time Doctor, allowed me to collect interface elements and experience the software firsthand. By installing and configuring the software, visualizing worker data, and creating automated rules with the platform, I gained an understanding of how managements could use the platform. In turn, I experienced what the workers could perceive or not and if these platforms act in a way to show themselves to users or remain hidden. For this work, I observed only the proprietary websites and comments and used cases involving the platforms to analyze the evident points in the channels that aim to offer arguments and show the features that are capable of monitoring the workers' activities.

Another way in which I applied technography was by choosing to not restrict my observations to the logic of the platforms in their construction since a purely interface view would not suit this study. Instead, I searched in the proprietary channels of the platforms for marketing elements that listed a number of key points. They are (1) how features were described, (2) perspectives on metricizing the work and the worker;

and (3) client testimonials. This material highlights not only the company's vision but also that of clients, considering bossware not only as a time manager but also as a platform for worker surveillance and control.

Technography thus proved to be a productive method for discovering the materialities and imaginaries embedded in these platforms and identifying how they aimed to intervene in work relationships.

Time Doctor

Time Doctor is a SaaS (software-as-a-service) platform developed by Staff.com, which defines itself as "an instrument that enables businesses and individuals to become more productive" (Segalla, 2021, para. 5). With a promised partnership between the platform and Redington, the largest provider of IT software and distribution products in India (PRNewswire, 2020), it aims to acquire new customers based on the partner's presence in more than 200 information technology brands worldwide, increasing its reach.

The range of third-party applications to which the platform can be connected enables both the output of information—such as payment services based on hours worked—and the input of data that such connections can make, allowing specialized services in managing activities and tasks to collaborate, for example, with the tracking of activities. Altogether, more than 60 integrations reinforce the platform's characteristics of being "interchangeable" (Sadowski, 2020, p. 46) making them broader and more integrated, expansive, and intelligent.

According to its website, Time Doctor (2023) has more than 250,000 active users and aims to "build a better workforce by the second" (para. 12). The page is divided between explanations about the product (with claims of up to 22% more productivity), monitoring features that allow clients to "know if they are really working when they say they are" (Time Doctor, 2023, para. 6), and testimonials from clients.

For Time Doctor, productivity is based on understanding how workers are using their time. To do this, the platform needs an executable file to be installed, knowingly or not, on the device of the person who will be providing the service. From then on, according to the client's wishes, monitoring will take place in two different ways: The active way—in which the employee participates—and the passive way—in which the employee does not have control of the moments that are or are not being monitored.

In the first case, employees are aware that a service is monitoring their actions, and they can define the beginning and end of each assignment. Using a stopwatch, the software starts monitoring their activities, and from that moment on, information is tracked such as websites accessed, programs used, typing speed, and screenshots at a given time interval.[2] Recently, the platform included screen recording, which considerably increases the penetration into workers' daily lives.

In the second case, workers are not aware of the software and do not have control over it. Whenever the work device is used, information will be tracked. Even if the worker suspects that they are

[2] The time interval is defined by the system operator. According to Time Doctor, everyone—including the worker—has access to the screenshots obtained and is able to remove them if necessary.

being surveilled, there are no easy tools to detect or manage it. In general, this type of invisible installation is carried out in devices that belong to the company and provided to workers who are outsourced or who work from their homes.

Throughout the working hours, workers who have access to the platform, as well as the manager, are able to analyze performance based on time spent on websites, platforms, or applications. In Figure 1, the employer is able to define which information obtained is considered productive or not, and based on this survey, Time Doctor will calculate how much time allocated to work was actually used for "work."

***Figure 1. Productivity chart* (Barili, 2022).**

Time Doctor, however, is not restricted to employers who wish to optimize their pay only for the hours they consider worked. Developers claim that the platform can also be hired by self-employed professionals who wish to have a more managerial view of the use of their own time, thus becoming more productive. Using the platform's "insights," workers are able to optimize time, define better strategies, and even set the costs of their deliveries from the report obtained, which is easily measurable through interactive graphics, as seen in Figures 2 and 3.

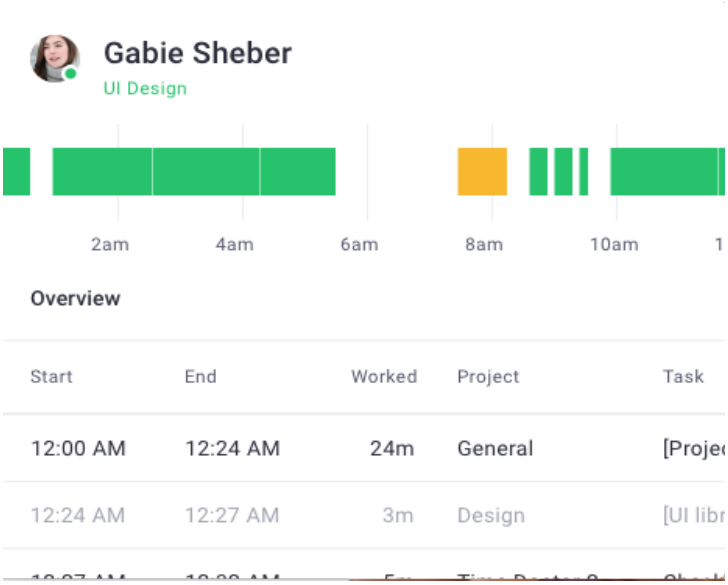

***Figure 2. Time Doctor productivity analysis* (Barili, 2022).**

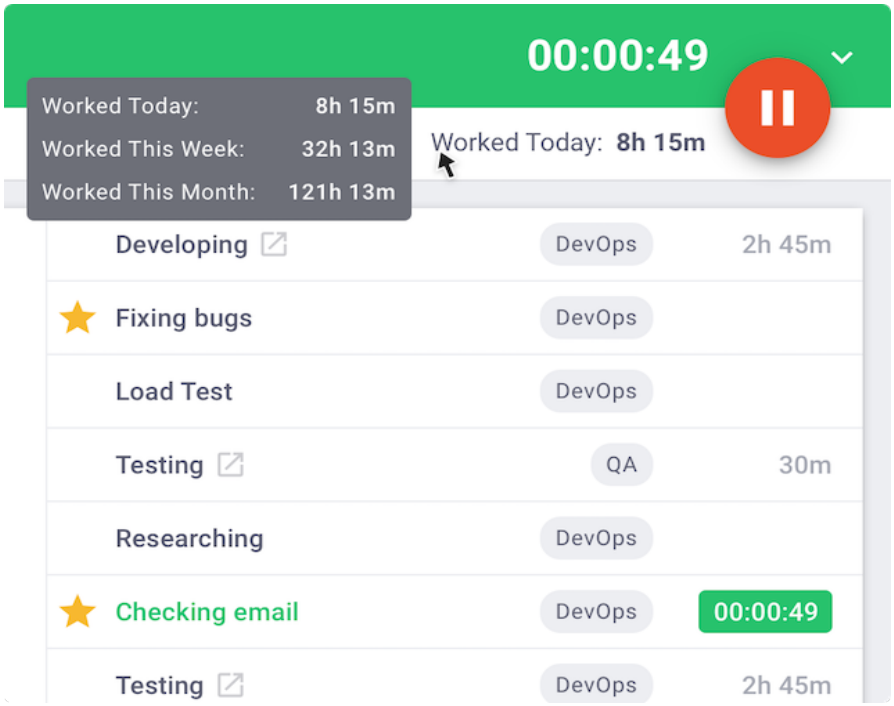

***Figure 3. Time Doctor productivity analysis* (Barili, 2022).**

Nevertheless, the discourse promoted by Time Doctor is that there are numerous advantages for employers. According to the website (Time Doctor, 2023), "When your employees see how tracking their

time gives them valuable knowledge about their strengths and weaknesses, when they are overwhelmed and when they are underutilized, you'll be amazed at how productive, accountable and self-directed they become" (para. 3).

Such rhetoric suggests that Time Doctor is not based solely on its technological apparatus, which is responsible for capturing, analyzing, and delivering data to interested parties. Instead, the copy implies that the very existence of monitoring and control elements increases productivity—and this takes place not through improvements in workflow but from a conditioning process aimed at increasing productivity. Thus, as Mulholland and Stewart (2014) note, direct monitoring of workers affects performance and productivity (though it does not necessarily entail a change from dishonest behavior or pretending to work to honest behavior).

Time Doctor's control elements, capable of directing or modulating the behavior of workers, are diverse. In addition to the Tracker, it includes features for maintaining focus, such as the distraction alert (Figure 4). If a person spends a considerable amount of time with the work timer activated, but without interacting with the device, a countdown alert appears and, if there is no intervention, the system automatically closes the service time.

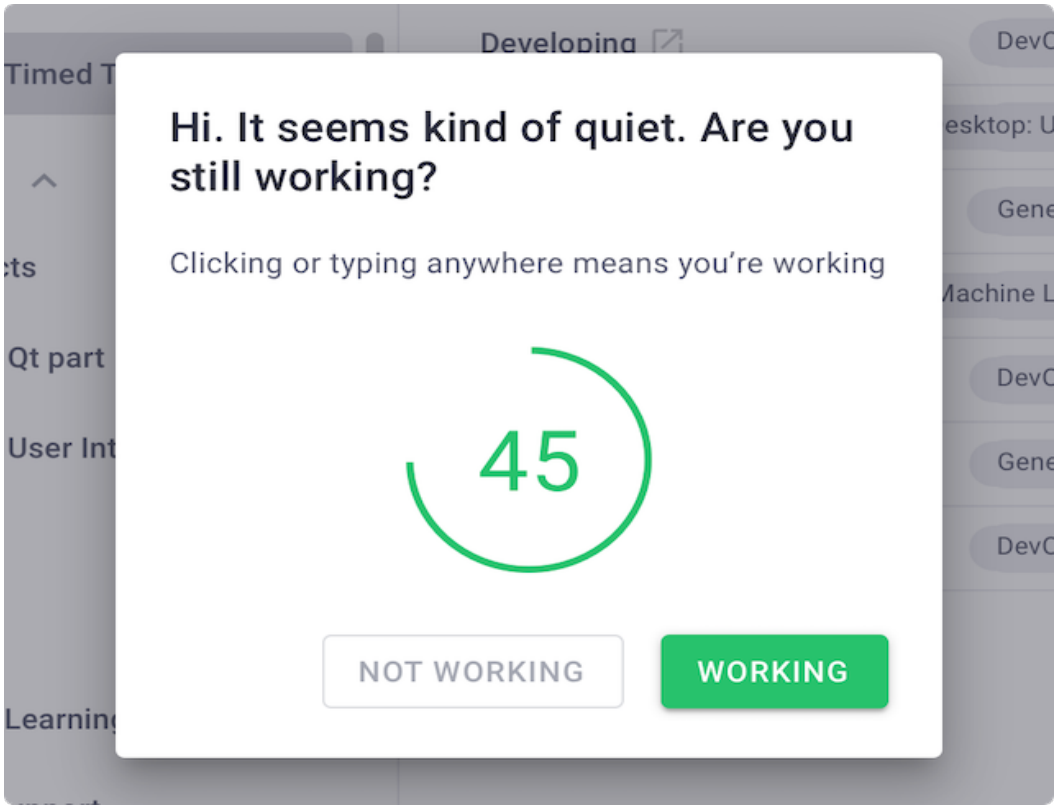

Figure 4. Time Doctor distraction alert **(Barili, 2022).**

This reinforces how intrinsic the worker's relationship is with the device and with time, both being interconnected and having to act together to define what activities should be compensated or not. This is not only present in the platform's artifacts but also in the discourse of clients. For example, one client (Time Doctor, n.d., para. 1) claims the tool gave his customers a clear view that workers were providing the service properly. This implies showing both that they are not wasting time and that they are not being paid for nonwork activities. As another example, the chief executive officer (CEO) claims the "screencasts" tool—which makes screen captures—was a differentiator as "he can now provide accurate proof of work to his clients in real time" (Time Doctor, n.d., para. 8).

Another case study on the website (Table 1) claims the platform stimulated competitiveness among workers. In the report, a CEO (Konur, n.d., para. 5) states that working time is not necessarily a factor of productivity but rather one of high performance. To foster this performance, he published the graph of hours worked offered by the platform so that all workers could observe it. According to the CEO (Konur, n.d.), the dashboard tool—which shows how much each worker worked—"added an element of competition to the team's workday" (para. 9) by making them compete with each other to reach their goals (Figure 5).

***Figure 5. Testimonial on the Time Doctor website* (Konur, n.d.).**

Table 1. Testimonial on the Time Doctor Website.

"Without Time Doctor, tracking performance is unbelievably hard to do!" (Konur, n.d., para. 1)	
"We are SEOzeo. a leading SEO consulting/community agency providing services to top brands located in Turkey. We help our clients rank better in Google's organic search results. Our clients include well-known global and international brands such as PepsiCo, Yves Rocher, Ernst Young, Milliyet, and TRT." (Konur, n.d., para. 2)	"We tried it both ways, at home and at the office. We shifted to a full-time remote company for seven months. During this time, we discovered Time Doctor. "Now the whole team. 17 people in total work in one of our two offices. They are either in the Ankara office or our main office in Istanbul." (Konur, n.d., para. 3)
"Time Doctor added an element of competition to our team's workday. They check in when other employees start and end each day trying to outdo each other." (Konur, n.d., para. 4)	"Time Doctor has changed our approach to work. For us, the number of hours worked does not necessarily indicate an employee's work productivity, but it is a strong predictor of high-performing team members. As a 24-year-old novice president, I found that getting an in-depth analysis of all the performance data was a lot of work. Because I hate micro-managing my employees, I'm able to see the big picture of my team's performance by analyzing time spent on projects. Time Doctor's new API helps us integrate the data with our internal performance measurement systems." (Konur, n.d., para. 5)
"Our company believes in internal transparency and sharing all data openly. That is why, on our Time Doctor account. everyone is everyone's manager, so that time data can be seen by everyone. While we don't believe that fierce competition among team members is beneficial, we have noticed that the Time Doctor system has added an element of competition within the company. Employees check in when others start and end each day and try to outdo each other. We integrated Time Doctor with the company's Slack account, so that we can control hours and share the results with the whole team!" (Konur, n.d., para. 6)	"Without Time Doctor, tracking performance is unbelievably hard to do! Knowing who starts work on time or seeing which team members put in the extra effort is something unbelievably hard to track and often forces me to micromanage my employees, which I absolutely hate. "We are one of the fastest growing SEO companies in the region. Time Doctor is the employee management tool that allows us to expand the team more easily." (Konur, n.d., para. 7)

Despite its ease in collecting information, Time Doctor is not intended to be a stand-alone tool. As a platform, it enables and supports connection with other services, which can either take advantage of their features or provide information to them. Time Doctor allows more than 60 external applications—encompassing activity and project management platforms, payments, customer relationship management, service and support, and communication among others—to connect with each other. These integrations

expand its reach, enrich its database, and even bring new insights and also facilitate activities that rely on Time Doctor, such as payment per hour worked.

According to the Time Doctor logic, workers are paid not for all the time given to the company but only for the time actually "worked" (according to the platform). The tool allows workers to check whether the productivity measurements are correct and they can request the removal of certain screenshots. Any change, however, appears to work against the worker as each screenshot removed may also reduce their paid time.

The power game between employers and employees is more favorable for the former. On the one hand, there is a system with long-term information designed to distinguish what is "productive" from what is not through silent or opaque data collection. On the other hand, employees have their activities monitored without fully understanding when they are being monitored or what information is obtained. The collected data and their analysis work in favor of the employer because the platform was built for them with the purpose of increasing profitability and is driven by technological belief. The resulting "insights" become almost unquestionable to the point where workers who contest them may attract blame or suspicion.

These data-driven "insights" echo Beer (2019) who argues that data visions are an artifact of power that is based on the construction of a new form of knowledge. Time Doctor's reports make it possible to assess worker productivity not only individually but also collectively as either productive or nonproductive. Coworkers assessed in conjunction become easy targets in times of dismissal in which productivity is a criterion, eventually dooming those considered less productive in decision making based on data.

Teramind

Teramind is a SaaS[3] platform from the company of the same name. Teramind presents itself as a tool that monitors not only productivity but also behavior in general, both individually and at the group level. The company aims to identify deviations in worker behavior and deploy reports, e-mail warnings, or block certain features or the entire device. In fact, Teramind has been classified as the most invasive platform among 10 competitors (Fennell, 2021). The importance of considering this platform is to characterize the "need" for this type of surveillance that is "so widespread that it goes beyond mere monitoring productivity in the workplace; instead, it seeks to discover the individual behaviors and personal characteristics of workers" (Ajunwa et al., 2017, p. 111).

Teramind is used in sectors in which information is the main operational input, such as financial, legal, retail, technology, manufacturing, energy, and health areas as well as government agencies. Thanks to the segments served, the platform has expanded the number of users by more than 4,000.[4] According

[3] Software as a Service is a product offering that does not involve a direct purchase but rather a license to operate the product during the term of contract. This ensures a more flexible operation and allows upgrades, updates, and even new features in a practical and instantaneous manner.

[4] For contractual reasons, Teramind preserves the name of its customer base (Buckner, 2020).

to the website (Teramind, 2023), clients range from small establishments to large corporations. For some clients, granular assessments of isolated or combined workers are the need; for others, Teramind meets information security requirements.

To meet so many different needs, Teramind offers four different modes (Figure 6). The Starter model focuses on behavioral analysis in a more distant way, with more generic behaviors. The User Activity Monitor version is the in-depth version of Starter, for those who wish to observe and know each worker's movements, with combined actions that may pose more direct risks to the company's interests. The Data Loss Prevention version aims to preemptively prevent data loss and leakage with functions to block actions before they are carried out. Finally, the customized version aims to meet different needs according to the challenges presented.

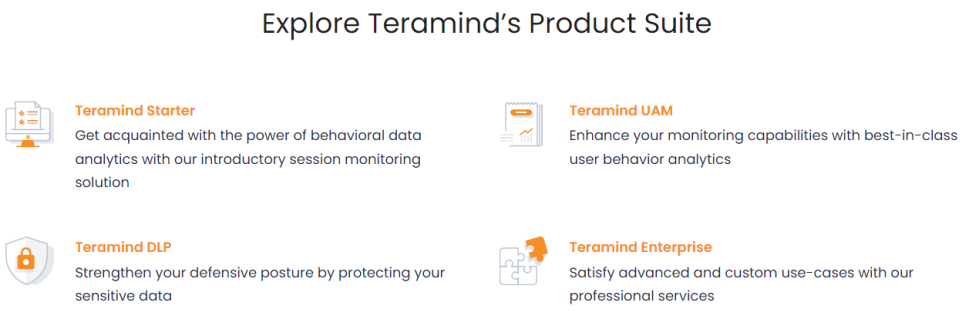

***Figure 6. Varieties of Teramind* (Teramind, 2023).**

For Teramind to work, a wide range of information must be collected. From an executable program installed on the worker's computer—whether the worker is aware of it or not—the platform starts to send information as the user interacts with the device. On the top layer, this includes keyboard input information, mouse movements, screenshots and recordings, audio streaming, and screen reading.[5] By assessing these data, Teramind aims to understand the individual or group behavior of workers, thereby seeking deviations or actions that may threaten the interests of the employers.

On its website (Teramind, 2023), Teramind endorses the power of behavioral analytics and its ability to activate triggers from mechanisms composed of highly customizable smart alerts and rules. To understand each employee, the platform carries out three key actions: (1) comprehensive monitoring of safety behavior, compliance, and productivity; (2) real-time alerts, which allow administrators to know when employee activities violate defined rules; and (3) automated response actions in the form of alerts or direct

[5] Based on an interface accessible only to the administrator, it is possible to immediately start capturing ambient audio from the device's microphone.

actions on the device. Each of these can be analyzed from the perspective of power, modulation, and control, which I discuss below.

The first point, which acts directly on the view of behavior and conformity in search of offering security and productivity, is in line with Foucault's (1987) work on panoptic institutions. Teramind, in this sense, operates as a place where workers are exposed to maximum exposure, in which all movement is observed in the search for deviations. Results desired by clients are found in the modulation of the bodies and in punishing infractions. Take, for instance, someone sending a file with credit card numbers to an outside server. One response is for the program to trigger an Internet connection failure, preventing the information from being leaked. A second response is a coercive effect. when workers may fear they are being watched and feel compelled to conform to the order . Coercion may occur subtly through a warning on the screen and e-mail to the manager, or more emphatically, by blocking access to a feature or system. It should be noted that the difference in the way of acting may or may not reveal the existence of an agent. While in the example of Internet failure, one is not sure about the cause of the problem—it could be a connection, hardware, or infrastructure problem—in the second case, involving the blocking or warning, Teramind presents itself as a direct agent. The intentions of those who hired the platform can be satisfied by the exposure, or not, of a surveilled, monitored environment that acts on bodies.

Real-time alerts—the second case to be highlighted in the behavior analysis module—echo Sadowski's (2020) concept of a network of stakeholders who play the role of gatekeepers, as in a digital fence. Through such devices (sensors, software, platforms, algorithms), all behavior that deviates and does not go through the checkpoints must alert the interested sectors so that the necessary actions can be taken. The checkpoint moment occurs when the platform becomes active when what is expected is not met. The disciplinary quality of Teramind is revealed only when correcting behavior. In these infractions, the material collected—screen captures, websites accessed, documents, and keys pressed—can be sent as inputs for later verification. The intriguing aspect here is that deviations trigger the platform to identify behaviors deemed appropriate, which establishes a compliance framework where standards are reinforced, thereby preventing actions contrary to company rules or preferences.

The third point, automation of actions, deserves a more in-depth approach as it is through understanding workers and corporate dynamics that a series of triggers are configured. Teramind's predictive capability allows it to act preventively whenever it understands that there is a possibility—based on previous events—of undesired actions. Here, control is presented as a suppression of possible futures or the kidnapping of the future (Bruno, 2020), when actions based on past interactions or preconceived elements are used as a basis. This violence is performed against workers when controlling what actions they may take based on restrictions or coercion through automated actions. Automatic decision-making systems draw on previously collected data to activate defense mechanisms whenever necessary. Prediction has been addressed by O'Neil (2021), who claims that such models can present failures, biases, and conditions that may lead to incorrect decision making. Attempts to abstract a multitude of actions on data lead to a series of simplifications. These, as far as these biases are concerned, are reduced to models that, in the way they are built, tend to fail, as key information can be disregarded with or without the intention of the people involved. This datafication of actions gains new power by allowing this informational quality to activate triggers with little to no human supervision, which may compromise the day-to-day activities of workers.

As addressed by Barili (2022), the search for violations—Teramind's main goal—characterizes a contemporary form of surveillance that moves past the fixed site of the panopticon, aiming for the "free movement" of workers. The more freedom given to workers—flexible hours and places, for example—the greater the power of surveillance and action over them, an insight recognized by Teramind (2023) when stating that "managing the dynamic workforce of anywhere requires versatile solutions that provide effective and well-informed metrics and insights" (para. 5) Such deeper or more pervasive surveillance is necessary for those who wish to know everything about their employees and to keep a close eye on them, even out of the office.

The Platformization of Surveillance—Conclusions

The scenario in which we find ourselves is far from the one Taylor (1911) experienced, and close observation no longer accounts for the complexity of workers' tasks. Close observation is also hampered by the displacement of workers far from company offices. The evolving nature of work dynamics, characterized by increasingly dynamic and nonlinear activities, differs significantly from traditional production line environments. Consequently, it necessitates the development of new methods for surveillance, monitoring, and control.. Surveillance at work has undergone a transformation in which data are not only captured but also analyzed, and decisions surface in the form of alerts, actions, graphics, and other elements.

Time Doctor, Teramind, and other bossware must be understood not just as software but as platforms. Bossware leverages the infrastructure facilitated by the digitization of work environments to apply principles of overseeing, monitoring, and surveilling employees. This surveillance extends beyond the physical workspace and the confines of office walls. These systems, backed by third-party technologies, seamlessly and instantly exchange and process data and information as a standard practice. The addition of sensors, prediction algorithms, machine learning, databases, and connections with other applications aims to increase operational autonomy and acquire more articulated information.

In this context, digitalization is harnessed to pervade the work environment, mainly by rendering devices inconspicuous and diverse in their operational modes. Bauman and Lyon (2013) describe invisibility as an attribute achieved through the sophistication of surveillance devices. However, in this scenario, invisibility assumes a critical role to ensure that employees remain unaware and do not alter their behavior solely to cater to the algorithms or management's preferences. Regarding invisibility, Ajunwa (2018) draws attention to legal and private aspects such as the conditions under which workers will be able to discuss the results of the assessments, as well as the origin, period, and retention of data collection. Disputes regarding analysis methods currently depend solely on the platform company or software developer, leaving little room for effective actions by the bodies under surveillance, the workers themselves.

This shift in power, brought about not only by work surveillance but also by its platform-based nature, is amplified by opacity, invisibility, and detachment from the individuals under surveillance. Consequently, workers' apprehensions result in an unintended outcome for these platforms, which strive to enhance productivity, optimize time, and improve the work-life balance. This apprehension is a by-product of the shift in power dynamics, driven by surveillance methods that lack transparency, remain invisible, and maintain disconnection from those being monitored.

Belief in the data can also be seen as another factor that is leveraged in the platformization of surveillance. In the case of Time Doctor, time allocated to work is the element that consolidates and solidifies the information, dividing and clustering people between productive and unproductive, allowing those who fall into the unproductive to be disconnected through a quick dashboard analysis. On platforms similar to Teramind, control also characterizes the platformization of surveillance. While in more traditional environments, the weight of managers was more evidently felt, here it is possible to choose from the mildest to the most emphatic action. These features make the environment more conducive to broad interactions, with freer and more complex labor dynamics, while penetrating even more through the collection and analysis of workers' actions. Managers stop systematically looking at an individual and start looking at the broader labor pool, silently increasing or decreasing the degree of surveillance as necessary.

Both platforms share the initial objective of organizing and controlling the workforce. However, each platform adopts a distinct approach to work dynamics.. While Time Doctor focuses on work "efficiency" based on capturing and circulating information, Teramind focuses on prediction, which requires an understanding of the chained actions of workers. These differences are reflected in marketing material and discourse. Time Doctor, focused on productivity, employs a user-friendly interface and enables not only management but also workers to access this information. Teramind, focused on supervision and behavioral control, is squarely aimed at professional clients and employs a corporate discourse evidencing its computational power.

Based on these differing objectives, these two platforms are designed differently, resulting in different inputs, processing, infrastructure, and outputs. Whether optimizing the workforce or preventing data breaches, each product develops a particular collection and processing algorithm while also cultivating certain relationships with other technological companies and solutions. Table 2 sets out the main points that distinguish each platform.

Table 2. Platforms.

	Time Doctor	Teramind
Goal	Workforce optimization	Internal threat control
Niche	Companies that hire third parties	Companies that work with sensitive data
Surveilled elements	Time allocated to each activity; platforms used to perform assignments; downtime	Uptime; actions taken; manipulated files; screen reading; screen recording
Automation	Reports; integration with external APIs; downtime alert display	Behavior prediction; previous restriction of access in case of operational risk
Discourse	Productivity increase; audit of hours worked; monitoring of the evolution of activities	Reduction of operational risks; audit of processes and compliance; improved security of information and internal assets

The general lack of transparency between management and workers is further heightened by these platforms. Both Teramind and Time Doctor allow clients to choose whether they operate "silently" or not. This is a double move, simultaneously exposing the worker while protecting the employer, who is provided with a privileged place of observation, decision making, and action. The result, according to Indiparambil (2018), is that the ultimate goal of obtaining the desirable behavior is not achieved; instead, trust between workers and employers is eroded. Workers dissatisfied with this constant surveillance—and the competition

that may emerge among employees—may feel less comfortable remaining in their jobs, resulting in increased employee turnover. For workers, the issue here is not limited merely to being watched, monitored, and controlled but also to having their lives governed by algorithms. O'Neil (2021) provides a critical perspective on how algorithmic models carry out what she calls a condemnation. Workers are judged by these surveillance platforms but do not participate in their construction or audit.

To respond to these conditions, three steps are recommended. First, we must examine the extent of opacity in these platforms. This opacity varies, depending on who deploys the system and to what extent it is disclosed to the worker. This variable opacity allows those controlling the system to obscure its existence to the worker, even concealing it completely. Second, we must consider the damage caused by these systems. Workers are often unaware of such systems' existence, making it challenging to gauge the harm from their perspective. However, employers have a clear intention to intensify and evaluate workforce performance. Third, we must evaluate the new power dynamics that bossware enables. Through granular assessment of work and predictive technologies, these platforms act to safeguard the interests of the management. The power dynamic shifts, to varying degrees, toward the employers. Therefore, it is imperative to engage in discussions centered on public policies, regulations, and workers' advocacy to ensure that privacy is respected, assignments and work metrics are transparent, and monitoring activities are subject to reasonable limits. This approach aims to foster a more equitable balance of power.

Time Doctor and Teramind are not merely platform-based timers but capture, categorize, and manage actions and compensation. These database-driven "solutions" aim to define how productive a worker has been and how much they deserve to be paid. Time Doctor does not seek to understand workers to personalize work or benefit them but rather gathers data to optimize workforce efficiency. Similarly, Teramind distinguishes itself from platform-based solutions by enabling employers to manage the extent of surveillance over their employees: The operator can decide how much they want to know about each worker and direct varying levels of monitoring toward different groups. This behavior shows that, despite everyone being under the same algorithmic surveillance infrastructure, the observer's gaze can shift according to circumstantial changes or the interests of different groups. Unlike Time Doctor, Teramind provides a range of insights about each worker, groups of workers, and even comparisons among them. However, it still follows the same logic of not offering substantial or personalized information returns that would favor the creators of that data: Workers.

Time Doctor and Teramind exemplify the convergence between platforms and surveillance but shift from a two-sided market to a three-sided one, where the worker's perspective is ignored in terms of dialogue and knowledge. In both cases, it becomes clear these tools are not designed for data collection merely as surveillance capitalism (Zuboff, 2018)—converting human experience to commodities—but rather to monitor and serve capitalism as instruments of control, coercion, and behavior modulation to maximize productivity or discipline bodies in the workplace, often without the worker's knowledge that such tools exist.

One unanswered question is regarding the boundaries of data on these platforms. By having connections with third-party applications, it is not known to what extent information about worker productivity and behavior circulates and is analyzed. With fluid boundaries among applications, there is room for platforms to create productivity maps by sector, region, gender, and amount paid to provide directions to companies looking for cheaper and "more productive" labor. Despite bossware's attempt at

control, there are possibilities not only for dialogue—through the performance of workers against the algorithm—but also for cracks, in which employees are able to find ways to circumvent the code, as well as automations and use of other devices to access social networks, for example.

These concepts and findings suggest that further studies on the increasingly deeper penetrability of platformization in labor practices are needed. While these processes are not entirely novel, it is clear that their sophistication and growing influence enable rapid collection, analysis, and inference without requiring additional human observers. By leveraging a digital environment and various technological solutions, surveillance practices are fortified through the platformization of society. Furthermore, there is room for additional discussions to emerge from the scrutiny of platform-driven surveillance practices on workers. These discussions should delve into the conditions that are imposed, how these conditions are presented to workers, and how these solutions actively participate in the dynamics of work described in this article. In the realm of communication studies, research of this nature should promote a critical and analytical perspective on the use of technologies for controlling and surveilling bodies, exploring both the material aspects and the imaginations embedded in such platforms.

Finally, studies like this one also serve as a means of struggle and resistance. They provide a foundational knowledge base for workers, helping them explore ways to disrupt surveillance and advocate for legislation that clarifies the nature, scope, and timing of observation, analysis, and control. It is thus anticipated that discussions surrounding the platformization of surveillance, both in the workplace and beyond, will become increasingly prominent and span an array of areas of interest.

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