Remote Work Is Here to Stay: A Journey Through Time and Technological Development

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Remote work is not new. For some jobs it was actually the mode of work that was preferred or even required. This has been true for writers, journalists, salesmen, and artists. Yet, for most of us the norm was a job performed in an employer's facilities: an office, a factory, a lab, a lecture hall, a classroom, a workshop... Presence in person at a workplace provides structure, focus, imposes a certain level of professionalism and standardization, as well as allows for easier monitoring of employee's progress and effort. It also helps divide professional and personal lives, which constitutes a healthy approach. Sometimes physical presence is mandatory in the case actual interaction with other humans or machines is essential in performing the tasks at hand. It is difficult to imagine remote hairdressers or mechanics – even though, actually, less and less so.

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> THE ABILITY TO WORK REMOTELY WAS SOMETIMES SEEN AS A PERK, BOTH FOR WORKERS AND EMPLOYERS, AS WORKING FROM HOME IS MORE EFFICIENT BOTH IN TERMS OF COST AND TIME

Globalization and the rise of multinational corporations changed the way employees work. With multiple divisions around the globe and dispersed expertise, the teams were often virtual in the sense that team members never meet in person due to various locations of the individuals. This mode of work may be called semi-remote work, as it took place mostly on the employer's premises, but team members were spread all around the globe. Application of *semi-remote* work also brought about realization that, in many cases, there is little to no benefit in mandating certain workers to the office, since they have little physical interaction on-site. This insight gave rise to *home-office*, when worker's presence was not required for some days during the workweek. At the same time, Internet connectivity and technical infrastructure improved at homes, which was required to conduct work in a way analogous to the one in the office. The ability to work remotely was sometimes seen as a perk, both for workers and employers, as working from home is more efficient both in terms of cost and time (mostly in relation to commute). From the point of view of the employer, it was also beneficial, as it allowed a reduction in the cost of office space, increased morale and gave an extra motivational tool. Still, employers were wary of potential slacking off by employees, improper behavior – especially when facing outside parties, – and productivity losses. All in all, the whole premise reached a certain equilibrium, where remote work was present, but not dominant.

In order to accommodate the needs of employers with respect to remote work, new technology was required in terms of

> DUE TO THE CORONAVIRUS PANDEMIC MOST BUSINESSES HAD TO SWITCH TO SOME SORT OF REMOTE WORK ALMOST OVERNIGHT

hardware, software, and infrastructure. Initially, the focus was on hardware – with laptops and mobile phones on the forefront. However, software solutions were also required. At first, they were based on periodic synchronization with employer's systems whenever in office or with proper network access. As the access to Internet became more widespread both at homes and remotely, solutions could become more on-line in nature. With new possibilities and technology, a number of solutions followed to accommodate the needs of remote work that included teleconferencing, remote collaboration, knowledge sharing, and monitoring tools.

However, these new modes of work and tools were more common in the largest companies, which were forced into limiting face to face interactions due to their sheer size[1]. Smaller companies were not that interested in remote work, being more fearful of the dangers of remote work and lacking access to pricey technology. There was just not that much to gain for them as they are much more centralized[2].

And then the year 2020 came along. Due to the coronavirus pandemic most businesses had to switch to some sort of remote work almost overnight, unless they were deemed *essential* – a distinction closely resembling the one made by Douglas Adams[3]. Many workers finally achieved the highly desired option of working from home, while employers were nudged into adopting solutions that earlier they avoided as much as possible. Surprisingly, soon enough, almost all of the employers realized that such an approach yields a lot of cost-cutting possibilities, especially in terms of office space expenses and now claim home office is here to stay to a much larger degree than in the past. Meanwhile, however, employees found out that working from home is not as much fun as they expected. In fact, it is much more difficult to separate professional and private life, many workers feel trapped at home and struggle to avoid distractions[4]. Those workers who thrive in such conditions constitute a minority (16%), while more than half of employees find the current situation to be really difficult[5].

Fortunately, the technology was available, fast, and reasonably cheap at this point. Still many servers on the side of vendors needed quick expansion in order

[1] https://www.statista.com/statistics/1123806/share-employees-access-remote-work-size-firm-us/

[2] https://www.forbes.com/sites/nigeldavies/2020/03/10/this-is-why-employers-are-still-denying-your-remote-working-requests/

[3] Adams, D. (1989) *The Restaurant at the End of the Universe: Hitchhiker's Guide to the Galaxy,* Book 2, Vol. 2, Tor: United Kingdom.

[4] https://buffer.com/2021-state-of-remote-work

[5] Martec Group (2020) *Working Remotely During COVID-19: Case Study*. Available [online]: https://www.martecgroup.com/wp-content/uploads/2020/11/The-Martec-Group-WFH-COVID19-Summary.pdf

> COMPANIES DID NOT REALIZE THAT REMOTE WORK BRINGS ALSO NEW RESPONSIBILITIES, NOT ONLY BENEFITS

to accommodate peaking demand. There were some hiccups, but the upscaling of infrastructure went surprisingly smoothly – mostly due to applied cloud technology. The bigger problem was that neither smaller companies, nor workers, were prepared for remote work neither in terms of hardware nor software. Companies did not realize that remote work brings also new responsibilities, not only benefits. According to a survey by buffer.com, 75% of 3,500 companies around the world surveyed in 2020 did not pay for Internet access of remote workers and other costs[6]. This technology and responsibility gap is an important distinction between corporations and small and medium enterprises (SMEs). Furthermore, many countries were not prepared for such a change from the point of view of labor code, which would clarify responsibilities of employers towards remote workers[7]. Still, the urgent need for remote work during the COVID-19 pandemic created a situation in which some of the remote work was performed outside the bounds of legal framework[8].

In general, the technology created in order to enable remote work may be divided into several segments:

- **Communication enhancement:**
  - videoconferencing tools and video calling;
  - telepresence (including VR and ER);
  - instant messaging;
- **Collaboration tools:**
  - knowledge sharing;
  - document collaboration;
  - project management tools;
- **Other tools:**
  - activity monitoring;
  - presence monitoring;
  - performance evaluation.

COMMUNICATION ENHANCEMENT

One of the biggest challenges of remote work is assuring that the social bonds, culture, and communication within an organization are not interrupted too much by physical distance. These challenges include not only purely technical elements (like information flow), but also other elements arising from frequent interactions like human connection, emotional attachment to the employer and coworkers, maintaining work culture and integrity. Achieving this goal requires a great deal of innovation – and, indeed, in the face of pandemics, the wave of innovation accelerated. Communication tools can be roughly divided into two groups: asynchronous and synchronous communication and the

[6] https://lp.buffer.com/state-of-remote-work-2020

[7] https://www.irishtimes.com/news/crime-and-law/change-to-remote-working-would-raise-a-range-of-legal-issues-expert-says-1.4459519; https://knowledge.leglobal.org/corona/country/poland/poland-planned-changes-in-regulations-regarding-remote-work/; https://www.cms-lawnow.com/ealerts/2020/12/russia-changes-labour-legislation-on-remote-work

[8] https://www.prawo.pl/kadry/praca-zdalna-czy-pracownik-moze-wyjechac-za-granice-i-tam,506709.html

distinction between them is the timing of the responses.

Asynchronous communication tools are probably the simplest form of communication enhancement and the oldest one. It is a case when one party posts a message and awaits some time for a reply. This type of remote communication is the oldest known to humankind and includes letters, telegrams, and similar devices. Today, these methods are to a large degree obsolete, but linger on due to legacy issues, inadequate education, and access to technology, especially in older generations and in less developed countries and regions. They are, however, inconsequential for remote work.

These means of communication are also one of the oldest tools provided by the Internet[9]. These include forums and e-mail. The business was quick to adopt them, primarily e-mail, which continues to be the backbone of most communication systems at work – both in the case on remote and on-site work. The problem is, however, that this channel of communication is usually quite dry, and while it fulfills most of the information transmission roles, it does not substitute well the emotional and social component of communication in person.

Internet also allows for the creation of a hybrid of synchronous and asynchronous communication: instant messaging. Its origins can be traced to the beginnings of the Internet in the 1960s and IBM's Compatible Time-Sharing Systems[10], which allowed multiple users to log in and send messages to each other. Instant messaging is a hybrid system, because it allows for both instantaneous communications, when both parties are on-line, and delayed responses in case they are not.

> ONE OF THE BIGGEST CHALLENGES OF REMOTE WORK IS ASSURING THAT THE SOCIAL BONDS, CULTURE, AND COMMUNICATION WITHIN AN ORGANIZATION ARE NOT INTERRUPTED TOO MUCH BY PHYSICAL DISTANCE

The first instant messenger that was widespread among consumers was ICQ, launched in 1996, followed by AIM, introduced by America Online. Further platforms followed shortly. Soon it became hard to manage the multitude of platforms by the users. This led to the rise of aggregation services – like Jabber, which allowed the use of various platforms at the same time using one IM client. The market was later reshaped by the rise of messengers integrated with social media platforms –

[9] Van Vleck, T. (2001) *The History of Electronic Mail.* Available [online]: https://www.multicians.org/thvv/mail-history.html

[10] https://www.multicians.org/thvv/7094.html

like Google Chat, MySpaceIm, and, eventually, Facebook Messenger[11].

Adoption of instant messaging at workplace was mostly driven by employee behavior that used consumer solutions at work. This phenomenon was somewhat problematic as it was outside of standardized procedures and employee monitoring. The issue was remedied only at the end of the 1990s by developing Enterprise Instant Messaging (EIM). First solutions included Sametime in Lotus Software and Microsoft Exchange Instant Messaging shortly after that. More of them followed, including Jabber XCP, Cisco Unified Presence, and specialized platforms – like Reuters Messaging and Bloomberg Messaging.

Instant messaging to a degree helped overcome emotional distance of asynchronous communication by the invention of emojis. These graphical manifestations of emotions arose from even earlier pictograms created from regular characters in chat rooms. Our ability to infer information from tone of voice or body language is mostly lost in written communication. Emojis gave a substitute and it should not be underestimated. In fact, they are widely recognized and in 2010 they were included in Unicode (standard set of characters for computers) and now appear in all sorts of written communications.

One may think that asynchronous communication should be rendered obsolete by on-line videoconferencing and is not really applicable to remote work. This belief is, however, far from the truth. The rise of digital communication and mobile devices introduced a plethora of distractions into the workplace. It is great if you need something quick, but troublesome when there are plenty of communication requests. Asynchronous communication allows for uninterrupted time to focus on personal tasks and, at the same time, keep tabs on ongoing issues.

As for synchronous communication, the telephone is the oldest and most adapted technology. In the case of remote work, of course, a landline is not really applicable. This is not a problem when one takes into consideration how widespread the mobile devices are. In recent years, however, traditional telecommunication is, to a degree, being replaced by other means of communications – mostly integrated with abovementioned instant messaging systems, which were developed primarily for traditional PCs and Voice over IP solutions. Their main advantage is similar to mobile phones – the user can be reached even when switching locations, unlike in the case of landlines. These solutions are

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ADOPTION OF INSTANT MESSAGING AT WORKPLACE WAS MOSTLY DRIVEN BY EMPLOYEE BEHAVIOR THAT USED CONSUMER SOLUTIONS AT WORK

[11] Petrionzo, M. (2012) *A Brief History of Instant Messaging*. Available [online]: https://mashable.com/2012/10/25/instant-messaging-history/?europe=true

supplemented by software that originated on mobile devices, not PCs. The most popular of them are WhatsApp and Viber, which over time migrated to PCs as well.

While sound-based communication is certainly better at maintaining social connection than asynchronous written communication (even when emojis are included), humans were working on including the video part as well. The goal was to mimic face-to-face meetings (almost) perfectly. The earliest video-calling solutions were quite clunky and expensive, requiring specialized equipment and infrastructure. These solutions were introduced for the first time commercially in the early 1980s with upfront cost of a quarter of a million dollars in set-up and hardware. The cost of a call was at a rate of USD 1,000 per hour, offering very low resolution and large delays in visual. In the 1990s, corporate solutions that were more affordable and of a better-quality appeared, but they were still based on the same premise of dedicated hardware and, often, infrastructure. It was the early 2000s, when videocalling became integrated into instant messenger applications, bringing the technology to the masses.

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> THE RISE OF DIGITAL COMMUNICATION AND MOBILE DEVICES INTRODUCED A PLETHORA OF DISTRACTIONS INTO THE WORK-PLACE

In 2003, Skype appeared, implementing p2p protocol allowing cheap (or even free) calls to everyone. The big advantage of p2p protocols is that they utilize multiple connections between many computers at once. Every user contributes part of their bandwidth when needed. This solution allowed for large bandwidth without dedicated infrastructure. Decentralized protocol allowed also to include more participants into a videocall (initially, Skype allowed for 25 participants; later it raised the limit to 50), basically introducing videoconferencing to consumers and making older systems obsolete to a significant degree. Large corporations still relied on providers like Cisco, but these providers had to change their solutions to incorporate innovation in technology and decrease prices. In 2011, Zoom Video Communications was founded on an already very competitive market, and its software allowed for up to 1,000 participants for business customers. It became the platform of choice mostly for education services, despite its notoriety for privacy protection.

Apparently, a pretty straightforward idea of video connection was able to generate a multitude of innovation in order to manage the meetings. Some of them mimicked the features of regular meetings – like hand-rising, blackboards, and presentation/video sharing. Others provided features that could be applied in face-to-face meetings, but which in on-line were even more useful: polls, Q&A without interrupting the speaker, or breakout rooms, which allow participants to consult in subgroups and rejoin the plenary meeting in order to

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summarize findings. Quickly, new solutions appeared that supplemented standard solutions with extra features useful in particular situations – like brainstorming or scientific conferences. These include solutions such as Mentimeter, which allows to create on-line idea maps, or Miroboards allowing for brainstorming using post-it-notes. All of these features started reshaping the way employers perform meetings even before the COVID-19 pandemic. One very visible change was the adoption of huddle spaces – small conference rooms viable for a few workers, but equipped with videoconferencing equipment. These started to replace large conference rooms at a fast pace.

Soon enough, the idea of telepresence was taking a hold. Telepresence is an extension of the concept of videoconferencing, where the remote presence of a person is established via technical means so that it seems the person is actually present on site. This may include: ability to move in the environment, manipulate objects, but also receive stimuli from a remote location. Seamless videoconferencing was the first step in that direction, but it was quickly extended to include remote object manipulation. Sometimes, it included robots that were pretending to be an actual person.

Probably the best-known case are the interviews during TEDTalks with Julian Assange who was stranded in the Ecuadorian embassy at the time[12]. The technical solution resembled a tablet stuck on a lawnmower, but it allowed for movement and simple interaction (the same solution was later replicated in a popular geek TV series, *Big Bang Theory*). The ability to interact with remote objects seems trivial in the case of teleconferencing, but there are actually certain situation when it is crucial. For quite a while, remote work using telepresence has been used in extremely dangerous tasks – like disarming bombs or exploration of dangerous places. The rise of drones has also been a growing area of remote work, which spans tasks ranging from military to logistics. The pinnacle of telepresence is the DaVinci robot, which allows for remote surgery where a patient and a surgeon may be thousands of kilometers apart[13].

The COVID-19 pandemic greatly accelerated the adoption of videoconferencing and telepresence. 30% of organizations started to use videoconferencing solutions for the first time[14] and free teleconferencing solutions became extremely popular

[12] https://www.theguardian.com/us-news/shortcuts/2016/jun/27/snowbot-edward-snowden-telepresence-robot

[13] https://www.intuitive.com/en-us/products-and-services/da-vinci/systems

[14] https://www.twilio.com/covid-19-digital-engagement-report

overnight. Zoom has become the software of choice for many education organizations, as it declared it will be free for educational purposes[15]. Videoconferencing software of various vendors stated being downloaded millions of times per day[16].

Currently, the market is dominated by Zoom and its share is estimated at 43%. GoToWebinar follows with a 21% share, Cisco Webex comes third with 16%. Other major players include ON24, Adobe Connect, ClickMeeting, and GoToMeeting[17].

The challenges of impromptu remote work have shown to be considerate. Some of them are quite funny and have taken the Internet by the storm, like the case of the BBC live interview with Robert Kelly interrupted by his children[18]. This may look hilarious, but, in the long run, is a challenge in maintaining professional appearance in a home setting. A step in this direction is the introduction of background filters that are replacing clunky home interiors with a background of choice. It is quite ironic that technology that was developed to enhance our faces with rabbit ears and other funny filters were repurposed to change on screen anything but our persona.

Video conferencing companies try to tackle other problems arising from inadequate hardware in many home offices. The answer to this problem might be Hardware as a Service (HaaS), where a client is purchasing videoconferencing service access for a given time period and receives all necessary hardware. This approach, which was adopted by Zoom and other companies, will surely follow[19]. Similar solutions also try to meet sanitary requirements – for example, Google Meet introduced voice commands in order to minimize the touching of hardware[20].

> THE COVID-19 PANDEMIC GREATLY ACCELERATED THE ADOPTION OF VIDEOCONFERENCING AND TELEPRESENCE

The technological frontier in telepresence is marked by the use of virtual reality (VR) and augmented reality (AR) in remote meetings. AR and VR are related technologies that change our perception of reality. VR completely replaces our reality with an artificial one usually using a VR headset, while AR is only supplementing our reality with virtual objects or modifications usually using portable devices or glasses. So far, these solutions serve mostly consumers, as

[15] Konrad, A. (2020) "Exclusive: Zoom CEO Eric Yuan Is Giving K-12 Schools His Videoconferencing Tools For Free"., [in]:*Forbes*.

[16] Novet, J. (2020) "Zoom Has Added More Videoconferencing Users This Year Than in All of 2019 Thanks to Coronavirus, Bernstein says", [in]: *CNBC*.

[17] https://www.datanyze.com/market-share/web-conferencing--52

[18] BBC (2017) *BBC Dad: Interview with Robert Kelly Interrupted by Children Live On Air*. Available [online]: https://www.bbc.com/news/av/world-39232538

[19] https://www.pcmag.com/news/zoom-launches-hardware-as-a-service-products

[20] https://support.google.com/meethardware/answer/9473867?hl=en

over a half of the market share is directed at this sector[21], with products like Oculus, which is mostly dedicated to gaming and entertainment. However, many virtual meeting solutions are already in beta tests, including MeetinVR[22]. VA is also used for remote trainings, and this approach is growing in popularity as it promises significant cost-cutting possibilities while providing the highest quality of trainers, and in the cases where training materials are scarce. The best example is a solution allowing medical students to perform virtual autopsies using Microsoft HoloLense[23]. This saves specialized facilities and scarce cadavers for advanced learning.

COLLABORATION TOOLS

Remote work provides challenges beyond just communication. Tools that enable communications, described above, solve only a piece of the problem. In many cases, people need to collaborate to deliver results. In other cases, physical presence is required precluding remote work (but even these obstacles are, sometimes, removed – like in the case of the DaVinci robot); however, the object of collaboration can often be digital in its nature and, in such a case, remote collaboration is not a problem.

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Collaboration enhancing tools are a vital element of enabling remote teamwork. The history of collaboration software dates back to groupware of the 1980s. Probably the best-known software of this type was Lotus Notes – a desktop solution working on a common database that allowed users to collaborate on the same documents and tasks. The development of modern webpages (also known as Web 2.0) allowed for implementing these solutions in web browsers, thus making the software available remotely. This step gave rise to a multitude of intranet and extranet systems often based on the Microsoft SharePoint platform. Later, new options emerged that were more lightweight and moved from rather dry lists and calendars towards interface demanded by workers that were raised in mobile environments. Companies such as Slack, Chanty, or Mattermost gave a new outlook on how teams can collaborate remotely by giving the communication tools a modern interface and the ability to

[21] IDC (2020) Worldwide Spending on *Augmented and Virtual Reality Forecast to Deliver Strong Growth Through 2024, According to a New IDC Spending Guide*. Available [online]: https://www.idc.com/getdoc.jsp?containerId=prUS47012020

[22] https://www.meetinvr.com/

[23] https://case.edu/hololens/

organize communication in order to make it more accessible.

The features included by Web 2.0 were impressive and continue to be used extensively. However, over time, required functionalities were beyond capabilities of this technology. To solve this problem, standalone collaborative applications returned – the main example being Microsoft Teams, which integrate functionalities beyond collaboration like videoconferencing.

PROJECT MANAGEMENT SOFTWARE

One of the main challenges in remote work management is keeping track of the tasks assigned. While working on-site, frequent meetings – both scheduled and casual – helped streamline the projects. Working in an isolated environment is a recipe for delays and a decrease in the quality of performed work. This is why project management software is a crucial addition to the managerial toolbox in order to assure that the tasks are performed well.

The first project management software appeared as early as in 1977 created by Oracle and Artemis. Early software was mostly focused on scheduling, critical path management, and asset allocation. Their interface was not really user-friendly and used only by management even after the inclusion of Microsoft Project into the Office suite.

The Web 2.0 revolution changed the desktop approach, as it allowed team members to report tasks completed directly to the system. It allowed also for communication and documents management on the project. Currently, there is a multitude of project management systems in the SaaS mode (Software as a Service, where software is rented for a periodic fee – usually along with necessary infrastructure) – like Trello, Monday.com, Asana, ClikUp, and others. These platforms use inventive

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techniques in order to foster cooperation and engagement. For example, gamification techniques make the work feel a bit like a game where one can use avatars and earns little virtual trophies (for example, badges) or compete in prearranged challenges – for instance, using Kahoot[24]. These small changes actually change people's behavior and increase engagement by making work feel a bit like fun[25].

OTHER TECHNOLOGIES CRUCIAL FOR REMOTE WORK

Virtual Private Network (VPN) is an essential element of any remote work solution. It was developed in the mid-1990s and introduced by Microsoft to enable connection of separate local networks into one virtual, unified, and secure network. Initially, the idea was used to connect separate corporate locations without the use of dedicated infrastructure. Quickly, the idea was applied to connecting separate

[24] Shalev K. (2016) *Effectivley Manage a Remote Team via Gamification*. Available [online]: https://www.entrepreneur.com/article/272801

[25] Seaborn, K. and D.I. Fels (2015) "Gamification in Theory and Action: A Survey", [in]: *International Journal of Human-Computer Studies*, No. 74, pp. 14-31.

> CLOUD COMPUTING BY ITSELF IS NOT AS ESSENTIAL TO REMOTE WORK AS VPN, BUT IT CHANGED THE WAY MANY IT SYSTEMS WORKED TO BE MORE REMOTE FRIENDLY

computers into a corporate network. From this moment on, remote workers could use all of an employer's digital resources in any place connected to the Internet without compromising security too much. Despite the fact that some of the modern tools for remote work are web-based and do not require a secure connection to an employer's local network, still a lot of them are placed behind firewall for security reasons. Therefore, remote work on a large scale or for extended time periods in a work setting does not seem to be possible without VPN.

Cloud computing is a mixture of hardware and software solutions. The principal idea behind cloud computing is outsourcing infrastructure and its administration. Employers who move in that direction reduce or eliminate on-site servers and instead use datacenters for a periodic fee. This allows employers to focus on their core tasks while leaving complex problems of security, administration, backups, and availability to specialists. This sales pitch seems quite convincing, yet one must remember that cloud computing is done on actual hardware, which may malfunction or be otherwise destroyed. This is well demonstrated by a recent fire in the OVH data center that crippled multiple companies and services[26]. Cloud computing by itself is not as essential to remote work as VPN, but it changed the way many IT systems worked to be more remote friendly. In particular, the headquarters is remotely connected to the main servers as well, so remote access is a default mode of operations – unlike in the case of on-site infrastructure. Cloud computing is not only the HaaS solution (Hardware as a Service), but it also often extends into software solutions. This ranges from ERP software used to manage corporate operations to collaboration suites – like G Suite by Google. These are almost by definition accessible exclusively remotely. Again, this is not crucial for remote work, but made it much easier to implement.

The fears of employees slacking during remote work created the market for employee monitoring systems (the so-called *bossware*). Project management systems may be one way of controlling employees. However, some managers are not satisfied enough with results-based monitoring and insist on making sure that employees are actually doing something work-related during work hours. Validity of such an approach is, of course, debatable, but as long as there is demand, there is also supply.

[26] https://www.searchenginejournal.com/ovh-data-center-fire-darkens-thousands-of-sites-worldwide/398485/

> EMPLOYERS MUST WEIGHT COSTS AND BENEFITS OF A BIG-BROTHER APPROACH – BOTH IN TERMS OF COST AND IMPACT ON OVERALL EMPLOYEE MORAL

There is a plethora of software that allows for tracking employee activity on-line. Solutions such as Time Doctor, Toggl, Hours, Timely, Everhour, and many others allow for reporting time spent on tasks, but also monitor *poor usage* of time – for instance, when an employee accesses social media or Youtube, they are nudged by a pop-up to revise their reporting. Software of this type can also report time of keyboard and mouse inactivity. This, in turn, prompts hilarious employee counteractions, like simulating mouse moment with toy fan[27]. Catching such cases is relatively difficult and time-consuming, requiring further features – like remote screenshots, on-line monitoring and recording of activities. This approach also requires employees to dedicate their time to monitoring others. Employers must weight costs and benefits of a Big-Brother approach – both in terms of cost and impact on overall employee morale.

CONCLUSIONS

The propensity to work from home is clearly correlated with technological progress. Traditionally, few select jobs could be performed remotely, because in most cases the object of work was physical in nature and required collaboration with team members. All this shifted gradually with the digitization of the economy. When the object of work is digital, then – given right access – the location of the employee is irrelevant. Such conclusion led to the use – as well as invention – of secure data access techniques: primarily VPN, but also remote desktops, intranets, etc. All of these solutions were heavily dependent on and co-developed with mass Internet access – both at home and mobile.

Similarly, given appropriate communication channels, physical contact with other employees is not necessary. This may seem quite obvious, but in reality, it is much more problematic than data access. It appears that people value personal interactions. Work is something more than just performing tasks, as bonds between workers are an important part of the overall experience. This is why telephone and e-mail are not sufficient. The last few decades have shown constant technological progress in providing communication as close to the physical one as possible. What started with videoconferencing, is now changing into telepresence and virtual reality solutions. Strides in telepresence allow many to bypass dependence on a digital object of work, allowing for remote surgery.

The COVID-19 pandemic has accelerated the pace of adoption of these techniques, even if the innovation did not change the

[27] https://traqq.com/blog/the-top-6-ways-your-employees-can-cheat-your-time-tracker/

GIVEN APPROPRIATE COMMUNICATION CHANNELS, PHYSICAL CONTACT WITH OTHER EMPLOYEES IS NOT NECESSARY

way people work remotely yet. Still, the sheer size of the workforce performing their tasks from home is now reshaping corporations and smaller companies alike. Remote work is here to stay – regardless of former fears and objections of various companies.

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