

INTERNET OF THINGS AND EMPLOYEE HAPPINESS IN THE DIGITAL ERA

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Abstract

How we work, who we work with, and even what we define as work is rapidly changing, but the most transformational change may be occurring at the intersection of data, sensors, and artificial intelligence. Companies in all fields are beginning to dive into the world of big data to increase the health and happiness of their employees, along with boosting productivity and overall output. Employers now have more information than ever about their employees by using a variety of methodologies including workplace wearables. They are beginning to take on more interest and responsibility in their employees' mental and physical health. There are a variety of reasons for this, and one of them is the growing acknowledgment of the link between happy employees and better business performance. The future holds even greater things for the Internet of Things, especially in the workplace. In today's highly competitive work environment, developers are constantly thinking of new ways machines can help even more. Now the Internet of Things empowers employees to take control of their work lives, and more of them are now working from home, using IoT platforms to stay connected to their teams at the office. IoT solutions make workdays smoother and increase the well-being of employees. Methodologically, qualitative research was undertaken, resorting to a descriptive and exploratory literature review. In this paper, I have analyzed the concept of the internet of things, explained the connection between job satisfaction, motivation, and involvement. I also analyzed the advantages and disadvantages of this concept of the Internet of Things (IoT) on the employees in companies and how the workplace and quality of life directly influence employee's productivity. This paper examines the current state of this technology and multi-dimensional applications by surveying the relevant literature. The paper also evaluates the various possible future applications of IoT and foresees further developments and how these will change the way that life will be in the future.

Keywords

Internet of Things, happiness, employee engagement, job satisfaction, digital era

Introduction

We are living in a world where the emphasis is on technology, but we are still at the beginning of what will become an interconnected world. Gradually, we accept and embrace the changes brought about by this new concept of the Internet of Things that will be incorporated into every aspect of our daily lives. The concept "Internet of Things" is also shortly well-known as IoT which is coined from the two words i.e. the first word is "Internet" and the second word is "Things" (Madakam, Ramaswamy, & Tripathi, 2015, pp. 164-173). Enlightened minds of academics, researchers, practitioners, or innovators have tried to define this concept as well as possible, but the most appropriate definition is the following: Internet of Things (IoT) is defined as an open and comprehensive network of intelligent objects that can auto-organize, share information, data and resources, acting and reacting in certain situations and changes in the environment (Madakam, 2015, pp. 250-253).

The future is the Internet of Things, which will transform the real world objects into intelligent virtual objects. Numerous intelligent object interconnection solutions were developed in systems with different scales and objectives. There are already mentions of smart cities, smart homes, or digital health. The IoT aims to unify everything in our world under a common infrastructure, allowing us not only to control things around us but also it keeps us informed of the state of things (Madakam, Ramaswamy, & Tripathi, 2015). IoT solutions make workdays smoother and increase the well-being of employees. It is a human-centric digital service that focuses on improving employee well-being and happiness and increasing productivity by automating time-consuming and non-productive tasks of in-office communication and administration, it encourages employees to straight-forward human interaction, collaboration, and co-innovation. With the help of IoT sensors and software solutions, employees can easily find a suitable space for their work at a flex office (IoT solutions at workplaces increase the well-being of employees, 2018).

Today, this landscape is changing. The desire to improve experiences and cybersecurity initiatives driven by executive management, IT, Corporate real estate, HR, and other business functions is one of the drivers of IoT deployment and integration in the enterprise. Organizations need to realize the importance of restructuring the way the organization work, from the production management, human resources department, and all the other departments. Retaining employees and ensuring the engagement levels of employees will change the performances of the organizations without the need to implement other drastic changes (Bakker, 2015, pp. 723–732).

Erdogan et al. suggested a state view of workplace happiness which depends on satisfaction with the environment, and that leadership, career development, job characteristics, and person-environment fit contribute to an understanding of happiness or well-being at work (Erdogan, Bauer, Truxillo, & Mansfield, 2012, pp. 1038-1083). Employee engagement has become a key concern of scholars and practitioners because engaged workers are more motivated, more involved in their jobs and organizations, more productive, and more willing to go above and beyond what is expected of them to help their organizations survive and thrive (Bakker & Demerouti, 2008, pp. 209-223).

According to Schneider and Macey, employee engagement can be defined as having an organizational purpose, being involved, passionate, enthusiastic, and having the energy to perform work (Schneider & Macey, 2008). Because of that, it's important to know that when the needs of an individual are met, individuals will be emotionally and cognitively engaged. Thus, employees that receive sufficient continuous growth opportunities in any organization will feel a sense of belonging, involvement, and growth towards the organization. Individuals will tend to stay loyal to the organization (Nor, Arokiasamy, & Balaraman, 2018).

Another concept that we talk about in this paper is job satisfaction, which is a combination of psychological, physiological, and environmental circumstances that causes a person to say honestly that he or she is satisfied with his or her job (Hoppock, 1935). Job satisfaction is influenced by many external factors, but there is still something internal that has to do with how the employee feels. This means that job satisfaction has a set of factors that cause a sense of happiness (Vroom, 1964).

How the Internet of Things can improve employee happiness at the workplace

The Internet of Things made it possible to integrate and communicate between the current devices and even future devices to ensure that users will receive all the data that are necessary from all of their devices (Agrawal & Vieira, 2013, pp. 78–95). The devices will enable organizations to develop better products and services where maintenance and development can be done based on actual requirements. The software of the connected devices can also be updated easier compared to when they are not connected (Saarikko, Westergren, & Blomquist, 2017).

IoT enables higher levels of user enjoyment, creating an engaging work experience. IoT in the workplace is a powerful innovation, resulting in happier workers, more efficient employees, and which creates a better workplace to work (Kumar, 2018).

Now let's see how exactly IoT technology will improve employee happiness:

- *Intelligent lighting systems* - offer the possibility that light only goes on in a section of a facility or is dimmed at a certain level or rate depending on staff utilization, occupancy, or availability of natural light, which makes for a friendlier, less distracting environment (Rosencrance, 2016).
- *Ambient Temperature Control* - the monitoring of environmental conditions of cities can help to adapt to the indoor locations of the workspaces to be more comfortable for people who stay there. A way to improve the indoor conditions is an efficient temperature control; however, it depends on many factors like the different combinations of outdoor temperature and humidity (Meana-Llorián et. al., 2016, pp. 275–284).
- *Ergonomics and Wellness* - IoT devices are changing the way companies design office environments to support employee health and wellness. Now we talk about standing and sitting desk controlled via a touch screen and using cloud-based architecture to store individual profiles and preferences and smart chairs with sensors to alert employees when their posture is bad and provide recommendations for improvement (Nair, 2019).
- *Live Mapping* - live mapping technologies use a mix of beacons and sensors to help users more effectively navigate their offices. Several different technologies help us better understand how spaces are used and occupied. The data helps commercial real estate professionals optimize the tenant experience and helps the average worker seamlessly move through their day while cutting out unnecessary steps (Nair, 2019).
- *Room booking, availability, and management* - IoT enhances meeting planning and schedule visibility by making conference rooms smart. It means that employees can schedule a meeting in the most suitable room remotely, book the equipment required, and confirm one's presence or absence, all without a verbal agreement (Mikhailchuk, n.d.).
- *Flexible work environment* - it is important to equip all the employees with laptops to enable them to work from home and go a step further, to encourage home working (Kumar, 2018).
- *Access control systems* - IoT technology can even smartly replace the typical system of locking and controlling accesses. Many companies have already provided advanced electronic access control systems that do not need any sort of key. They do not even need any passcode or access card to provide access to workers and employees in a specific

area or facility and they can be programmed to provide access to specific people or specific accesses that can be secured only for specific people (Coppol, 2018).

- *Mobile phones and tablets* – The phones and tablets are the central hubs in IoT. They give us easy access to each other and our favorite things. We can review any product and service, and share our thoughts via social media. So far, business as usual for many of us as consumers (Willer, 2016).

- *VR and AR* - Virtual reality and augmented reality create a fast-track to digitalization. These technologies are creating breakthroughs in businesses. The latest iteration in this innovative arena is virtual chat rooms. Along with real-time 3D capturing and AR lenses, real-world experiences can be created in any environment. Meetings can now be made more interesting and interactive. Time and money can be saved in physical transportation, and a virtual meeting room can be created anywhere and at any time needed (Bhattaram, 2018).

- *Increased Energy Efficiencies* – Businesses use an enormous amount of energy each day to keep operations running smoothly. By working seamlessly together to maximize efficiencies, these examples highlight how IoT helps businesses save money while keeping employees and guests comfortable throughout the day (Stradley, 2018).

With the help of the Job Characteristics Theory framework, created by Richard Hackman and Greg Oldham (Hackman & Oldham, 1975, pp. 159-170) we can see that through applying automation via the Internet of Things there will be an actual increase in employee satisfaction in skill variety, task identity, task significance, and autonomy:

- For skill variety, we understand more diverse skills used and fewer rote tasks performed leading to higher satisfaction, and with IoT solution, sensors can take over rote observation and monitoring tasks from employees. In this case, the employee is freed to focus on higher-skilled activities (Friedman, 2018).

- Another IoT solution is to collect sensors data and displays, showing process-wide key performance indicators for more insight into the big picture, which leads to higher satisfaction. In this case, employees will be able to feel connected beyond their contribution to the entire process (Friedman, 2018).

- For a positive impact on the company or others leading to higher satisfaction, the IoT solution is to collect sensors data and displays, showing live financial key performance indicators for the employees to be able to feel connected to the big picture and see how they impact the business (Friedman, 2018).

- For autonomy job characteristics, meaning more personal decision-making leads to higher satisfaction, the IoT proposed solution is to show workers the information they need such as historical data and trend lines. The IoT impact for the employee is to be able to make informed decisions (Friedman, 2018).

HR departments should devise strategies to absorb the impact of the Internet of Things (IoT) on multiple aspects of Human Resources. William R. Tracey, in *The Human Resources Glossary*, defines Human Resources as the people that staff and operate an organization (Tracey, 1991). Human Resources is also the function in an organization that deals with the people and issues related to people such as compensation and benefits, recruiting and hiring employees, onboarding employees, performance management, training, and organization development and culture. Human Resources evolved from the term: personnel, as the functions of the field, moved beyond paying employees and managing employee benefits (Heathfield, 2019). As an organization's most significant asset, employees must be hired, satisfied, motivated, developed, and retained.

Information Technology is crucial to enable organizations to deliver state of the art HR services and with reduced costs, that have enabled companies to purchase or rather opt for HR technologies (Ball, 2001, pp. 677-693). The Internet of Things is all set to transform not only life at home but also human resource management at the workplace. Internet of Things will set up the ecosystem for the organization to connect, track and measure the effectiveness and efficiency of humans in the digital work environment and enable the employers to make appropriate HR decisions to benefit organizational growth with the availability of easy and cost-effective employee data (Venkatesh, 2017).

One of the impacts of IoT on Human Resources is: IoT improves employee experience. Employees, managers, and HR carrying Internet-enabled mobile devices are connected round-the-clock (HR Trend: Make Employee Experience a Top Priority in 2018, 2018). For instance, they can instantly book meeting rooms, communicate with any team member, exchange ideas, and do a lot more. In this way, IoT optimizes the effectiveness of employees' workday and offers a better work experience. Also, employee wellness can be monitored and measured on an ongoing basis through the same technology. If corrective steps are taken on time to improve employee health, the purpose of introducing technology would succeed (How Internet of Things (IoT) Will Impact HR?, 2018).

IoT enhances the productivity and the effectiveness of the employees in different ways. First, it provides various means of gathering better data which could have been tallied up manually, making it prone to human error. The better data collected through the IoT devices assist the HR managers in making better decisions during scheduling, maximization of the employees, and so on (Savaram, 2019).

The potential risks of the Internet of Things

IoT can be integrated into anything, from coffee machines to fitness watches, leading to making our lives more convenient. But what happens if they turn bad? When being unwillingly infected or hacked, these blessings can certainly turn into huge threats. Collecting Information by hacking a webcam, another person can see what they are pointed at without you even knowing it, smart TVs and personal assistants can pick up sound, and smart cars can give clues to whether or not someone is home (Richard, n.d.). Another issue is security, which is a dynamic game, the more updated the smart objects are, the more protected they are. Of course, software updates only partially solve the problem and represent a temporary patch. We know that through the IoT we can both detect environmental conditions and remotely control most common devices used in everyday life. Questions that arise: Are internet data communications 100% secure? Do the devices have a degree of security that cannot be penetrated?

Privacy is another issue behind the IoT. All data should be encrypted so that data about your financial situation or what food you eat is not shared with other people who should not have access. According to The Economist magazine, computer security is a myth, and computers will never be safe without significant changes in the way computer software vulnerabilities are treated by consumers and the industry (The Economist, 2017).

Liviu Arsene, Global Cybersecurity Researcher at Bitdefender says that IT security specialists have discovered and continue to discover vulnerabilities that can be

exploited remotely by attackers and that it can compromise both users' data and the security of the home network to which other devices are connected. The fact that so many IoT devices are vulnerable makes them the perfect target for attackers, as they can be used as access points in the home network (to which they are connected), or in the workplace network in our case, and from there, attackers can pivot on other devices (China-Birta, 2018).

Future applications of the Internet of Things

What was once the field of science fiction, today is a reality that is developing day by day. This will improve the quality of our lives, but it will also change the way we work, which means that we will have to assimilate new knowledge and skills to keep up with a world in constant motion and innovation. In the future, employers will be interested in technology and how it can influence employee happiness because we already know that a happy employee is also a productive employee. Based on some past researchers, internet technology has the potential to improve the economy, social life, culture and enhance the performance of organizations (Isaac et al., 2017, pp.210–241). Currently, smart devices have been changing our daily lives making it more interactive and informative (Gubbi et al., 2013, pp.1645–1660).

Consumers won't be the only ones using IoT devices. Cities and companies will increasingly adopt smart technologies to save time and money. This means cities will be able to automate, remotely manage, and collect data through things like visitor kiosks, video camera surveillance systems, bike rental stations, and taxis (Patras, 2017).

The arrival of 5G will shift the auto industry into a higher gear. The development of driverless cars, as well as the connected vehicles already on the road, will benefit from data moving faster. The new cars will increasingly analyze our data and connect with other IoT devices including other high-tech vehicles on four wheels (Ngoc, 2020).

Conclusions

The IoT has gradually brought multiple technological changes into our daily lives, making our lives simpler and more comfortable by accessing various technologies and applications in all areas, including medical services, manufacturing, industry, transportation, education, or even the workplace. We can say that any evolution of technology is beneficial, but we must also be aware of the associated risks.

It is already known that the old systems of punishment and reward no longer work in the long run in modern society, and performance depends more than ever on hedonistic principles. This means that the employer needs to pay more attention to building a pleasant work environment, involving staff in challenging and rewarding activities, and rewarding them with methods that are more about the right hemisphere of the brain than rational arguments.

The benefits of integrating the IoT into the workplace are numerous and speak for themselves: significant cost savings, improved productivity, increased energy efficiency and streamlined operations are all top of mind for business owners. The bottom line is

that the IoT provides advanced solutions for workplace and distribution challenges, reducing time spent troubleshooting issues and empowering leadership with more time to focus on serving their customers well (Stradley, 2018).

Finally, I believe that company management should focus on employee productivity through the Internet of Things technology. This means that we can talk about smart buildings and services that have direct implications for employee happiness and satisfaction at work. Employee productivity directly impacts good work and therefore an organization's success, and a smart ecosystem can also make for a smart management decision.

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