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Technostress and Organizational Culture in the Software Industry

Tecnoestrés y cultura organizacional en la industria del software

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ABSTRACT

This paper critically reviews the literature on technostress, the organizational culture of employee well-being, and the relationship between the concepts in the software industry workers. For this task, it is crucial to describe the characteristics of the software industry. After that, the definition and dimensions of technostress and organizational culture are explained. Finally, the relationship between technostress and organizational culture is presented.

Keywords: Technostress, Organizational culture, Software, Personal well-being.

JEL CODE: M19, M14, L86.



RESUMEN

El presente documento presenta una revisión crítica de la literatura respecto del tecnoestrés, así como de la cultura organizacional del bienestar del personal y la relación que guardan entre sí ambos conceptos en los trabajadores de la Industria del software. Para lograr ese cometido, en primer lugar, se presenta la industria del software, sus características y como se conforma. En segundo lugar, se presenta el tecnoestrés, su definición y sus tres dimensiones principales. En tercer lugar, se presenta la cultura organizacional y de forma específica las dimensiones que impactan en el bienestar del personal. Finalmente, la relación que existe entre tecnoestrés y cultura organizacional.

Palabras clave: Tecnoestrés, Cultura organizacional, Software, Bienestar personal.

Código Jel: M19, M14, L86.

INTRODUCTION

The changes in organizations since past decades demand modifications in the following paradigms: health applied to work and organizational culture (Cuervo, Orviz, Arce & Fernández, 2018). Three decades ago, a change was a milestone in organizational development. It consisted of the massive use of Information and Communication Technologies (ICTs), which began the evolution of the digital economy (Cardona, Kretschmer & Strobel, 2013) as we know it today. As a result, companies increasingly depend on technological infrastructure to host their applications, protect their information, communicate, and operate continuously and efficiently.

The digital economy dramatically affects how goods and services are provided in companies, leading to the satisfaction of technical needs through the development of the technology industry. A distinctive feature of the digital economy is the excessive technological competition and the struggle between organizations to develop cutting-edge technology, which affects human factor due to the demand imposed. Under this framework of ideas, the human resource is fundamental to generating ICT products and services, which increases productivity and the creation of innovative developments (Ueki, Masatsugu & Cárcamo 2005).

Mexico is a country within the context of globalization, so it is necessary to make proposals to increase the competitiveness and permanence of companies. This paper critically reviews the literature on technostress, the organizational culture of staff welfare, and the relationship between the two concepts. Those companies that are successful in the market have managed to obtain a sustainable competitive advantage, particularly as mentioned by Benavides et al. (2002). Latin American organizations must achieve organizational differentiation based on identifying and forming strategies oriented to human capital to achieve a competitive advantage. The human factor is vital in competitiveness issues, so it is essential that these individuals have work, social and family balance, which will result in optimal performance professionally, resulting in social, organizational, family, and personal welfare. In addition, the competitiveness of software industry organizations is essential for the country's development of the material wealth it brings in social and economic terms by creating jobs.

SOFTWARE INDUSTRY

Information and Communication Technologies ICTs are the technologies required to manage and transform information through computers and programs that create, modify, store, protect and retrieve information (Sanchez, 2008).

On the one hand, there is the machine as a physical tool known as hardware; on the other hand, the instructions or programming is called software. According to the criteria of the Organization for Economic Cooperation and Development (OECD), it is "a structured set of instructions, procedures, programs, rules and documentation contained in different types of physical media (tape, disks, electrical circuits, etc.) intending to make possible the use of electronic data processing equipment" (OECD, 2017).

For their part, Ceceña, Palma and Amador (1995) point to software as:

A list of instructions that tells the CPU what to do is the operating system and is essential for computer use. It is the primary program and from it can be introduced, indistinctly, a whole range of additional programs for specific uses. The instructions of these programs are written in machine format, that is, as binary expressions. (Ceceña et. al, 1995)

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The most widely accepted definition of software was proposed by the Institute of Electrical and Electronics Engineers (IEEE), which is the world's largest engineering association. The IEEE states that "software is the total of the computer programs, procedures, rules, documentation, and associated data that are part of the operations of a computer system." So, the concept of the software is more than just computer programs, whether they are source code, binary or executable code, as well as their documentation. That is why software is intangible. Software is also programmatic or logical equipment, a "set of programs that can run the hardware to perform the computing tasks for which it is intended" (Cruz, 2022).

The primary services targeted by the software industry are: "software development and IT services, interactive media (digital animation), contact centers (call centers and contact centers), remote business services and research, development, and innovation (R&D&I) centers" (Solleiro et al., 2015). These services form a cycle in which the activities with the highest added value are the initial ones (R&D&I), followed by the lower value activities of implementation and integration and implementation, then, advanced support and ending with basic operations.

So the software industry is all those organizations related to software: the data programmed into the computer or computer that constitute the logical or immaterial part of the computer

system, stored in a binary way in zeros and ones. However, on the other hand, data are values that are processed or produced as results, being simple, compound, or files.

Mexico is one of the leading Latin American countries oriented on the progress of the digital economy, for which it has given facilities for creating of new companies focused on cutting-edge technology, specifically in the software industry. In Mexico, technology centers stimulate the sector together; however, there are most profitable territories; in particular, Mexico City presents 1,023 Micro, Small, Medium, and Large Information Technology companies with approximately 135,000 workers (Table 1).

Table 1
Distribution of software companies in Mexico City

Size	No. of companies	Approx. number of employees	% of employees by size
Micro	477	3,000	2
Small	390	10,000	7
Medium	105	14,000	10
Large	51	108,000	80
	1023	135,000	

Source: Own elaboration based on INEGI (2019).

Tracing software-producing activities in Mexico leads to the identification of two activities classified in the traditional industrial statistics of the North American Industrial Classification System (SCIAN), namely activities 511210 Software publishing and software publishing integrated with reproduction and 541510 Computer systems design services and related services, established in the Economic Censuses (INEGI, 2019).

The development of the software industry brings significant changes on a social level and has improved the lives of workers; however, these new technological circumstances place novel demands on employees; these demands are recognized as learning demands and are the result of functional technological changes (Sanchez, 2008; Ayyagari, Grover & Purvis 2011). Moreover, demanding contexts allow tensions known as work stress involving damage to the well-being and health of people.

Within the Software Industry, workers perform different positions and functions; in particular, the software developer has been transformed in recent years, and its importance has grown exponentially. Their "main role is creating and adapting software, whose scope covers a range of applications, such as programs, processes, networks, version upgrades, patches, migrations, DevOps and testing." There are a variety of fields with opportunities for "software developers, including systems design, manufacturing, finance, publishing, and engineering" (Michael Page, 2022).

The most critical skill for the software developer is systems thinking, which is essential to project success. This "systems thinking, in general, is also considered a skill to perform management activities and is highly correlated with success in projects" (Frank, Sadeh & Ashkenasi, 2011), so both Systems Engineers and Project Managers should have systems thinking applied to the resolution of technical-managerial problems to generate synergy and have greater chances of success in the development of projects.

Software development sometimes turns out to be stressful, requiring the ability to work under pressure. It requires the dual ability of individual work and teamwork; hence such positions require capable and flexible workers to be self-motivated at crucial moments in developing specific software. Highly critical analysis and problem-solving skills correspond to highly efficient software developers in their job functions. Additionally, developers must have a clear understanding and vision of the company's structure and how it will operate. On certain occasions, the deadlines are very unfair, so the ability to manage time limits is necessary. Another essential characteristic of software developers is a taste for detail and an unwavering commitment to accuracy. According to Ruiz (2018), it is established that ICT forges new professional circumstances that are mainly demanding, specifically for employees of companies whose products and services are part of this complex world of Information Technologies. These work situations lead to higher employee stress and deteriorating social and individual life in the context of quality life (Carlotto, Welter & Jones, 2017).

TECHNOSTRESS

Job stress is a global health problem. Several kinds of research relate stress with diseases and productivity problems. For the ILO, this disease affects not only the health of workers but also the economic situation of nations, and the losses represent between 0.5% and 3.5% of the national Gross Domestic Product (GDP) (El CEO, 2020). The Pan American Health Organization (OPS/OMS, 2017) stated in 2017 that mental disorders are in the top 10 causes of international disability, anxiety disorders were manifested in 260 million people, and depression disorders were presented by about 300 million people around the world. In 2019 work-associated mental and behavioral disorders were reported as the 16th cause of illness by the Mexican Institute of Social Security (IMSS, 2019), representing 1% of the total work-related illnesses.

One of these repercussions is Technostress; this illness at work is determined by novel demands created by technology, by long exposures to recent technologies, by the incapacity to face effectively the over demands given by the use of technologies, and by the lack of individual abilities. Although, according to research, technology per se is neutral, which means that the use of technology does not manifest positive or negative effects; however, the demands and the lack of it favor the generation of stress (Salanova, Llorens, Cifre Nogareda;

2007). Therefore, technostress for this research, derived from the analysis of the conceptualization of various authors, is understood as:

The negative psychological state results from the unbalanced perception of technological stimuli due to excessive demands, lack of internal control, lack of social support and/or deficiency of rewards that affect workers' health, causing physical and mental illnesses.

A negative psychological state is distinguished by harmful characteristics for the subject in his psychosocial functionality, and the subject is in a psychological moment that will not allow him to perform adequately for himself or society.

An unbalanced perception consists of incorporating sensations deficiently interpreted as adverse that generate an insecure and unstable psychological environment.

Demands become excessive the moment the individual cannot meet them on a planned time and place basis under the job standards of the position held.

The lack of internal control is the inability to dominate the individual's impulses, emotions, feelings, desires, actions, and thoughts.

The lack of emotional support consists of the lack of accompaniment from collaborators, family members, and friends in the face of the adverse circumstances the subject is experiencing. A reward deficiency implies that the individual will not receive what he or she desires, whether these desires are expressed overtly or implicitly.

Workers' health can be physical or mental. Within the physical diseases are cardiovascular diseases, and mental illnesses are mainly depression and anxiety.

According to Llorens et al. (2011), technostress comprises four dimensions: fatigue, anxiety, skepticism, and ineffectiveness. However, for workers in the software industry, skepticism is an invalid dimension because these individuals are immersed in technologies daily. Skepticism is the negative attitude towards the experience of using technology. Negative assessments, avoidance, indifference, and in some cases, hostile expressions of negative opinions of information technology characterize this dimension of denial of technology.

In the affective part of the dimensions are fatigue and anxiety, both of which refer to emotional states that subjects experience when using information technologies.

Fatigue

Fatigue refers to tiredness, physical, mental, and even social exhaustion generated by the use of technology; this state generates in the individual a lethargy devoid of pleasure when performing work, family, and personal functions whose elements are very often confused

with elements of dysthymia. This type is characterized by "feelings of tiredness and exhaustion, both mental and cognitive, which attitudes of suspicion and distrust of the effectiveness of using technologies in the workplace may increase." This disorder comes from the information overload produced in workers by technology. In such a way, occupational wear and tear and the maximization of factors are intrinsically linked to the "excess of informational and communicational stimuli, which trigger cognitive fatigue and the activation of diseases of mental and neuronal character" (Arangüez, 2017, pp. 180, 181).

Anxiety

On the other hand, anxiety presents high levels of physiological activation and tension due to the use of technology, characterized by fears in two tenses, present, and future. The subject experiences the stress from a perspective that escapes his or her understanding and does not conceive in his or her mind the origin of the fears and obsessive thoughts. It is the most popular disorder and the most prevalent in workers to experience excessive levels of physiological activation of unpleasant character, feeling of tension, and perceived discomfort for the present or future use of digital devices. There are mainly two scales to measure this anxiety: the STAI-R and the BAI (Beck Anxiety Inventory).

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The Beck Anxiety Inventory is a useful tool to assess somatic anxiety symptoms in anxiety disorders and depressive symptoms. On the one hand, the STAI-R measures anxiety as a trait defined as "a relatively stable anxious propensity by which subjects differ in their tendency to perceive situations as threatening and to consequently elevate their state anxiety" (Spielberger, Gorsuc & Lushene, 2015, p. 7).

So, it assesses "abnormal or pathological behaviors (cognitive, emotional, motor or physiological) of anxiety (clinical anxiety)" (Sanz, 2013). Thus, anxiety is determined by being "a transient emotional state or condition of the human organism, which is characterized by subjective feelings, consciously perceived, tension and apprehension, as well as by a hyperactivity of the autonomic nervous system" (Spielberger et al., 2015, p. 7) reaching levels of dysfunctionality, frequency and pathological or abnormal intensity (clinical anxiety), in which the STAI-R detects individuals who consistently manifest these levels.

Ineffectiveness

In the cognitive part is located the dimension of ineffectiveness, which constitutes obsessive thoughts of ineffectiveness for using technology successfully. This perception implies more significant damage to the subject's psyche by presenting self-sabotage to the essence of the personal esteem of the worker, becoming his main enemy by consciously, frequently, and hostilely disqualifying himself.

For Llorens et al. (2011), technostress results from a perception of mismatches between demands and available resources, characterized by two main situations. The initial situation

refers to anxiety or affective symptoms concerning the high level of psychophysiological activation of the body, known as technophilia. The second situation is characterized by negative attitudes toward technology, known as technophobia.

So, there is a wide range of negative effects related to the inefficient use of new technologies: Cyber-tiredness, technophobia, technophilia, technophilia, techno-addiction, habeas data, techno-anxiety, technological scabbing, informational self-determination, expectations of confidentiality, the right to disconnect and cyber-surveillance.

Exposure to risk factors such as technostress during the working day is associated with various adverse health effects, such as psychological, cardiovascular, and musculoskeletal diseases (Cázares, 2020; Uribe et al., 2020). These findings stimulate the evaluation of technostress as a risk factor in various labor surveys of environmental and health conditions at the national level because there is a growing trend of employees who report being exposed, which raises the need to develop interventions in organizations in the software industry in a preventive manner.

Hence the interest in investigating the effects that technologies have on workers, particularly those workers who are immersed in this sector, being these employees, who present a potential risk of developing technostress. Moreover, technostress arises in a context where keeping up with the rapid advancement of technology impacts on workers who must constantly renew their technical skills while enduring the pressure of high productivity expectations and systems with increased complexity (Gaudioso, Ture & Galimberti, 2017).

Occupational and environmental medicine focus on the prevention, diagnosis, and treatment of occupational diseases and accidents through intervention, research, and practice; however, from this approach, the intermediary psychosocial processes between companies and employees are not identified, the relationship between the person and their work in a conception of the administrative and psychological type of work, which disturbs the productivity of economic representatives (Ladou & Harrison, 2015; Fernández, González, Iribar & Peinado, 2013).

Technostress is a disease that occurs in each of the organization's workers individually; however, this problem results in work performance, productivity, satisfaction, diseases, and change in habits, values, customs, and everything that promotes the culture of the organization.

ORGANIZATIONAL CULTURE OF STAFF WELFARE

Organizational culture is investigated on a large scale because several researchers have found that it is an important factor in the competitiveness and productivity of organizations (Cújar, Ramos, Hernández & López, 2013). Although in its beginnings, culture was the object of study of anthropology and social psychology, it was evident the need to understand this phenomenon through the management sciences (Pettigrew, 1979).

The term culture is commonly used among people. It refers to the set of "knowledge, beliefs, customs, values, attitudes and a series of social elements acquired over time" (Peiró, 1990) that are transmitted by various means with the aim "to ensure the coexistence or socialization of individuals who agree to participate in related behaviors with the rest of the group" (Peiró, 1990).

It has also been said that culture is "the characteristic way in which different populations or human societies organize their lives" (Hellriegel & Slocum, 2009, p. 39), and it is from this organic structure that the individual learns the behavior he must follow to fit into the society around him. The notion of culture is assimilated, accommodated, and transformed in the subject since the child is small and continues in constant evolution until death itself, hence it is relevant to clarify that culture is not static or inert, but on the contrary, is dynamic and evolves and transforms through external and internal influences that are established and accepted by the members of the group. Furthermore, there are various channels of transmission of culture, for example, family, friends, co-workers, institutions, the media, and social networks. Hence, the culture among a for-profit company's workers is called Organizational Culture.

Jacques (1972) states that culture implies thought and action, any organizational culture should not only be reflected in behaviors but also in thoughts, whose idea is conveyed in the same way by Schein (1996) by highlighting the three levels of culture, at the first level which are artifacts, the idea of behaviors by the workers of the organization and at levels two and three, values and assumptions, respectively emphasizes the fact that culture is reflected in thought.

Jacques (1972), Costa (1992), and Schein (1996) emphasize that culture is learned and that each new member who joins the organization must learn a culture; in this regard, Patlán et al. (2021) state that culture must be learned as if it were a new language with symbols and assumptions.

Costa (1992), Garcia and Lucas (2002), and Hofstede et al. (1999) agree that culture involves a combination of different factors, be they values, beliefs, norms of behavior, policies, ways of thinking, power relations, forms of influence and change, instruments of motivation, procedures, attitudes, basic conventions, ideas, basic assumptions, patterns, which make up the organization and are collectively programmed.

For Costa (1992) and Rodriguez (2006), through culture, an identity of the members of the work team is achieved, which, as Scheinsohn (2001) states, facilitates the generation of an organizational commitment transcending individual interest.

In such a way that the definition of organizational culture for the present work consists of the following:

The set of factors shared by the members of an organization, be these values, norms, beliefs, assumptions, or behaviors, which are programmed through collective experiences and learning in an identity that generates commitment beyond individual interest, whose implication covers the behavioral part (actions) and the cognitive part (thoughts).

Organizational culture has recently become a key factor for companies due to frequent environmental changes that directly affect them. Moreover, these changes in a social environment have a direct impact on culture and indirectly on other organizational aspects such as work climate, interpersonal relationships, and job satisfaction, mediated by attitudes, expectations, and emotions of workers: being important factors for productivity, competitiveness, efficiency and obtaining organizational results" (Cújar, Ramos, Hernández & López, 2013; Patlán et al., 2021).

The study of organizational culture and stress presented by workers is of relevance to the organization "in order to know what are the factors that affect workers subjected to work stress, depending on the type of culture that is present within the organization" (Díaz, Plaza & Hernandez, 2020, p. 109) for which extensive research is required.

Thus, professional competitiveness is the result of professional activity, as well as of the determined work circumstances. So, it is a work-related difficulty that initially damages the work environment generating an affectation of work, with health sequelae in people linked to broad and varied symptomatology (Fidalgo, 2007; Schaufeli & Enzman, 1998; Moreno & Baez, 2010).

The well-being or satisfaction of the personnel is an evaluative concept of the organizational culture. It qualifies the organization from the worker's point of view and "tries to answer what the employee feels" (Robbins, 1994), for example, "in front of the conflict management or the supervision practices" (Calderón, Murillo & Torres, 2003).

This type of culture involves personal and family development, the results of which forge "greater motivation on the part of employees, which, however, also generates a visible increase in productivity" (Cordero, 2022).

Bonilla et al. (2019) state that a "pleasant work environment facilitates interpersonal relationships, improves productivity, decreases ailments, absenteeism and staff turnover," so certain organizations are obsessed with ensuring a pleasant or happy environment for their workers. In this regard, Cordero (2022) found several investigations that showed "that happy employees are 12% more productive".

It has also been found that "the quality of supervision increases well-being and that the perception of well-being depends on the type of work and the dominant organizational culture" (García & Ovejero, 2000). Hence, "the association between one and the other concept is generally accepted by organizational scholars: for example, forms of leadership that exude trust and credibility, demonstrate sensitivity to people and listening skills improve people's well-being at work" (Robbins, 1994).

The opportunity to participate "in decisions that affect their immediate work environment and the organization of work improves personal satisfaction" while increasing organizational culture (Calderón, Murillo & Torres, 2003). Thus, the culture of people's well-being "has important effects on job satisfaction, commitment, and job stability" (Cameron & Freeman, 1991).

38 Cameron and Quinn (1999) highlighted the culture of inspiration, humanistic, based on social institutions, social responsibility, and individual potential, which generates a motivation in workers to fulfill the assigned tasks with an emotional rather than material commitment. Therefore, the culture of staff welfare is:

The collective work identity in which the quality of life, safety and values of workers are promoted to help balance between personal and work life.

It is a collective work identity, as proposed by Costa (1992) and Cameron and Quinn (1999) since it combines different factors (e.g., beliefs, thoughts, learning, philosophies) that make up the companies and that are represented by its members. The main factors of this culture are quality of life, safety, and values.

Quality of life

This type of culture promotes quality of life inside and outside the company (Lastra et al., 2019; Cordero, 2022) that allows a balance between personal and family life (Betanzo, De la Cruz & Espinoza, 2017). In addition, the quality of life in the workplace guarantees job satisfaction through the "possible promotions, motivation, human relations, self-realization, and participation of all collaborators" (Cordero, 2022).

Regarding motivation, the organization shares with the state, the responsibility of influencing the destiny of the population by motivating the workforce in order to "generate adequate development in the country" (Castillo, 2016).

The quality of life outside of work guarantees the worker's satisfaction with personal and recreational situations such as: "the salary received and benefits" (Cordero, 2022), "the need for assistance, recreational and cultural services, aimed at employees and their families" since these benefits and compensations complement the economic retribution and offer improvement in the quality of life of employees and their families promoting an adequate integral development (Castillo, 2016).

Quality of life focuses on the well-being of the members of the organization, including concern for the problems faced by workers; because they participated in the arrangements in the company, this work "is adapted to people's needs, differences and abilities, although it is difficult to be dismissed and lacks incentives to productivity" (Hofstede et al., 1999).

Cameron and Quinn (1999), in the second quadrant of their theory known as Adhocratic Culture state that workers and leaders by their motivation are dynamic, innovative, entrepreneurial, risk-taking, and creative.

Quality of life implies a development of employees by providing opportunities to meet a wide range of labor, professional, personal, social and economic needs of the worker to learn knowledge and develop new skills useful in their job performance, "with the possibility of job promotion according to the capabilities, knowledge, results and work merits of the worker, contributing to the worker to have a career and long-term job perspective in the organization" (Betanzo, De la Cruz & Espinoza, 2017).

It coincides with the development of skills argued by Denison (1990), in which the company incessantly promotes improving workers' skills to maintain competitiveness and take advantage of business opportunities. Safety refers to the "set of technical measures implemented by organizations, aimed at the prevention, protection, and elimination of risks that endanger the health, life, physical integrity of workers and the development of healthy work" (Betanzo, De la Cruz & Espinoza, 2017).

Safety promotion involves physical and emotional safety (Lastra et al., 2019). Although safety and hygiene possess an environmental nuance, "they go hand in hand with psychological and social well-being" (Cordero, 2022). Castillo (2016) argues that organizations face problems daily in managing different financial, addiction, and stress problems, which correspond with physical and emotional safety aspects.

This human well-being implies individual and collective security, the ability to acquire material goods and services that allow the worker and his family to live in dignity and comfort in terms of housing and physical and social health. Thus, job security is a balance in which there must be a balance between the well-being of the worker and that of the organization, since both are interrelated, since "a healthy and safe environment allows for mental health, job security and thus ensures the productivity and quality of life of employees" (Cordero, 2022).

Both Cordero (2022) and Cameron and Quinn (1999) mention that recognition and rewards are part of the emotional and physical security, respectively, that workers require from the organization. Recognition consists of "recognizing, distinguishing, congratulating, estimating or thanking the work performed and the achievements obtained by the worker in the performance" of his work; it is a response to the need for quality of life granted by the leaders "being able to exist the possibility of giving feedback to the worker so that the worker is motivated in the achievement of goals" (Betanzo, De la Cruz & Espinoza, 2017). On the other hand, rewards are retributions "such as salary increases, vacations, incentives, bonuses and other prizes that make the worker feel satisfied, as well as obtaining recognition for the quality of the work done" (Betanzo, De la Cruz & Espinoza, 2017).

Values

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For Schein (1998), values how subjects agree on beliefs, including norms and rules of behavior, strategies, philosophies, objectives, and principles, with intrinsic values from the formality of organizational activity. Adapted values determine how the organization performs activities, representing a higher knowledge of organizational culture. Companies and others promote values by individuals.

Within the values that organizations promote, Denison (1990) proposes the vision, since "every successful company must have a clear and shared image about the way it wants to be recognized," he proposes it as "a shared perspective composed of core values and is found in the minds and hearts of employees by giving them direction and guidance."

Another value promoted as a guideline of the organization is respect or consideration for others; this value marks limits to actions that may harm others, for example: "do not take what belongs to others, listen without disqualifying, do not harm, do not ignore, do not disturb, do not interrupt, or disturb with actions or words to co-workers" (Betanzo, De la Cruz & Espinoza, 2017).

The values manifested by workers are mainly commitment, honesty, and responsibility (Cordero, 2022; Cameron & Quinn, 1999; Betanzo, De la Cruz & Espinoza, 2017); however, there are also 13 values of flexibility, individuality, self-control, self-management and empowerment (Cameron & Quinn, 1999).

Honesty is a value expressed in behaviors of transparency of the individual to himself and those around him, discarding attitudes of hypocrisy, falsehood, and artificiality (Betanzo, De la Cruz & Espinoza, 2017). Responsibility implies acting with a sense of duty individually and socially based on an internal need of the subject that does not have a relationship with an external obligation (Betanzo, De la Cruz, & Espinoza, 2017). Finally, commitment is "the quality in the fulfillment of tasks, overcoming obstacles to carry them to their ultimate consequences, as well as the willingness to answer for one's actions" (Betanzo, De la Cruz & Espinoza, 2017).

TECHNOSTRESS AND ORGANIZATIONAL CULTURE

There is currently a large body of published research on psychosocial risks and technostress and their association with other variables (Gaudioso, Turel & Galimberti, 2017). In the review conducted by Cuervo, Orviz, Arce & Fernandez (2018, p. 18), 58 articles were identified, of which 30 were included in the final review. A further 14 articles were located through the manual literature search. These investigations "focus on analyzing the creators and inhibitors of technostress in workers, as well as the main consequences of materializing this risk on their work performance".

Additionally, they observed "a lack of empirical studies that allow establishing strategies to manage technostress adequately." Therefore, they concluded that "there is a need to delve deeper into technostress through empirical studies that are not only focused on proposing theoretical models for its conceptualization or on knowing its consequences in organizations, but also on proposing management strategies that reduce the impact of this new labor reality on workers".

Finally, Cuervo et al. (2018) propose new lines of research to understand and adequately manage technostress in workers, and it "highlights the lack of empirical studies that allow us to quantify the levels of technostress by business sectors" (p. 22). Although technology is present in practically any business sector, in the software industry sector technology abounds, so there is a need for future work focused on analyzing the incidence of technostress in this sector. Additionally, no research relates them to organizational culture and its measurement from quantitative methods in different types of organizations (Cuervo, Orviz, Arce & Fernandez, 2018, p. 18).

Employees of companies in the software industry have an imbalance between work and personal life due to social, demographic, health, and technological changes. The direct effects not only exclusively affect individuals but also companies by influencing staff turnover, job dissatisfaction, abstentionism, low innovation rates, low performance, and lack of

commitment to work (Ruiz, 2018). Furthermore, Martinench (2014) found an association between work stress and organizational culture, specifically in cultures focused on staff welfare: level of satisfaction, morale, communication, conflict resolution, and decisions aimed at continuous improvement change.

There is international evidence that health and productivity problems have a direct relationship with mental health problems, including stress, fatigue, workload, disabilities due to psychological disorders, phobias, compulsions, neurological diseases, psychiatric diseases, psychosomatic diseases, sleep disorders, depression, gastrointestinal diseases, anxiety, fibromyalgia, absenteeism, addictions, smoking, alcoholism, drug addiction, bad working environment, weak leadership, dissatisfaction, burnout, mobbing, lack of organizational commitment, among others (Uribe, López, Pérez & García, 2014; Cuervo, Orviz, Arce & Fernández, 2018; Ruiz, 2018; Uribe et al., 2020).

Based on the literature review, the Staff Well-Being Index was constructed, consisting of 3 sections. The General Data section includes information about the respondent, such as age, gender, academic background, and characteristics of the company where he/she works.

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Section I. Technostress includes 36 items, divided into three dimensions: anxiety, fatigue, and lack of effectiveness, subdivided into two categories, each consists of 3 subcategories. For the construction of the instrument, the literature review was considered, and 12 items were taken from existing instruments: 1 from Cázares and Villavicencio (2019), two from Cuervo et al. (2018), two from Maslach and Jackson (1986), four from NOM-035 (DOF, 2018) and three from Ruiz (2018) (table 2).

Section II. Organizational culture of staff well-being includes 36 items, divided into three dimensions: quality of life, safety, and values, subdivided into two categories; in turn, each category consists of 3 subcategories. These items were drafted based on the literature, and nine items were taken from the instrument developed by Patlán et al. (2021) (Table 2).

Table 2
Staff Well-Being Index items taken from authors.

Items	Authors
3	Cázares & Villavicencio, 2019
17 y 25	Cuervo et al., 2020
15 y 30	Maslash & Jackson, 1986
13, 14, 18 y 26	NOM-035
37, 39, 42, 46, 57, 58, 59, 60, 62	Patlán et al., 2021
21, 35 y 36	Ruiz, 2018

Source: Own elaboration.

The items of both questionnaires present the following considerations:

- Statements in declarative form,
- Concise and clear writing,
- Do not include confusing terms or words,
- They use simple sentence structure,
- The writing is in the first person singular,
- 41 statements were positively worded (direction of the construct),
- Thirty-one statements were written in the inverted form (opposite direction of the construct) to avoid acquiescence, i.e., the tendency of subjects to answer in the affirmative regardless of the content (Tomás et al., 2012, p. 105).

The instrument's structure is a Likert-type scalar, where one is "always" and four is "never", consisting of a set of items presented as statements or judgments to which individuals are asked to react. Thus, each statement is presented, and each response is assigned a numerical value so that the subject obtains a score about the statement and a total score, adding up the scores obtained in relation to all the statements. A characteristic of the items is that the response alternatives are fixed for all the propositions, and all have a designated weight or equivalent value (Fabila, Minami & Izquierdo, 2013, p. 33).

The instrument's content validity was carried out by expert judgment and by the method of individual aggregates. This validation was carried out by five management and software development researchers, who independently judged the relevance and congruence of the items. Within the necessary conditions for this validation, each expert received sufficient written information about the purpose of the test (objectives), the conceptualization of the universe of content, and the table of specifications of the study variables.

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Each expert provided information regarding clarity, tendentiousness, biases, and observations. Thus, 68 items had 100% favorable agreement among the judges (congruent, clear in their wording, and not biased). Three items were modified in wording based on technical words according to the context. One item was modified for clearer wording. In the end, 72 items remained. It was "an economical method because it did not require gathering the experts in a particular place" (Corral, 2009, p. 231).

Technostress. It is the alteration of the worker's health characterized by anxiety, fatigue, and lack of work effectiveness generated by excessive technological requests.

- Anxiety. The discomfort manifested through emotional and physiological behaviors alters the worker's health and is related to technological aspects.
- Fatigue. The physical discomfort manifests as a lack of physical energy and disinterest in activities unrelated to technology that alters the health of the worker and is related to technological aspects.
- Lack of effectiveness. These behaviors affect the worker's performance in their work activities and can be adequate or inadequate.

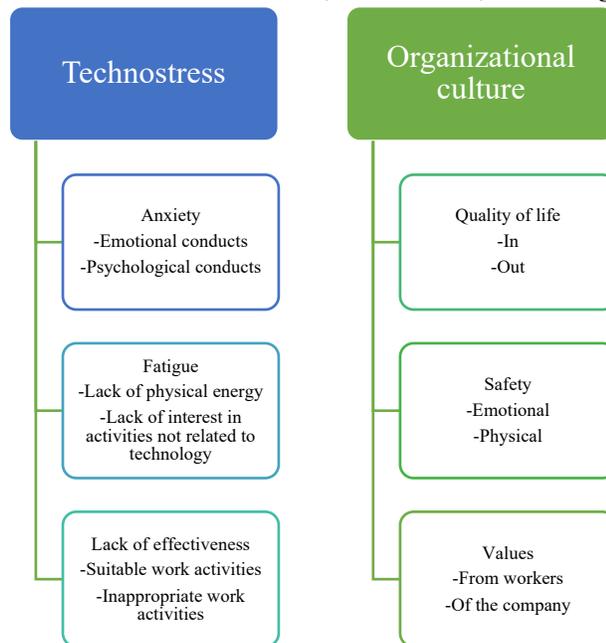
Technostress and Organizational Culture in the Software Industry

Organizational culture of staff welfare. It is the collective work identity in which workers' quality of life, safety, and values are sought and promoted to contribute to a balance between personal and work life.

Quality of life. These conditions of workers' social welfare are manifested inside and outside the company.

- Safety. The emotional and physical working conditions prevent harm to workers.
- Values. These are the principles, virtues, or qualities manifested by the workers, and those promoted by the organization.

Figure 1
Variables, dimensions, and categories



Source: Own elaboration.

This instrument can be analyzed using a transformation to the normal probability distribution function to obtain the values corresponding to each of the scales and thus establish the comparative level of each dimension (ranking).

It can also be analyzed with principal component analysis to find the structure of the correlations between many variables (Figure 1), in this case, each item, by defining a set of common underlying dimensions known as factors. The principal component analysis is a technique selected for the dimension reduction of the variables corresponding to the different categories included in the analysis (36 items of technostress and 36 items of organizational culture).

CONCLUSIONS

By relating the health and productivity problems previously exposed to family and social situations, they constitute psychosocial risks at work that impact unemployment, legal demands, and poor quality of life. This phenomenon, present in the international environment, is also identified in workers in the software industry of Mexico City (Villavicencio, Ibarra & Calleja, 2020).

Studies related to the quality of life of workers in the information technology sector (Al-Qallaf, 2006; Ayyagari et al., 2011) highlight the importance of having adequate conditions for the optimal performance of workers' activities, reducing overloads, providing adequate training, reducing extended working hours, and avoiding role ambiguity among others. In the same context, it is urgent to address the companies that make up the software industry due to the great economic and social impact generated in Mexico City, which faces more significant challenges arising from competition with transnational organizations, international markets, and globalization (Cázares, 2020).

The results in Mexico have "shown that psychosocial research of the negative effects related to illness at work shows significant prevalences and care related to productivity, health, empowerment, stress and its consequences" (Uribe, 2015). Therefore, technostress is an axis of attention for analyzing psychosocial risk factors based on their consequences in terms of health and productive matter (Juárez, 2015).

The characteristics of the culture of employee well-being can be promoted in the organization through transformative interventions. Hellriegel and Slocum (2009) argue that the basic methods used to preserve culture in a company can be used to transform it. So, culture is transformed by changing what managers and teams pay attention to, how a crisis is dealt with, the criteria for recruiting new members, the criteria for promotion within the organization, the criteria for rewards, and organizational rituals and ceremonies.

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