THE IMPACT OF TECHNOSTRESS ON EMPLOYEES
IN A DIGITAL SOCIETY

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Abstract

Stress has become a pervasive phenomenon in modern organizations, particularly through the use of new information and communication technologies (NICT) that allow employees to organize work in timesome and spatial flexibility, creating an opportunity for work-life balance. Although new evolving new technologies allow instant availability, facilitating communication processes and sharing information, they are a major source of stress due to the inability to cope with the requirements of NICT use. Thus, the study highlights both the positive factors and the stressors caused by the use of NICT within organizations, bringing preventive measures at the organizational level, which could help mitigate the negative effects induced by technostress, and increase welfare and employee satisfaction.

Key words: NICT, stress, technostress, positive factors, stressors, satisfaction, well-being.

JEL classification: M15, O15.

Introduction

Stress has become an epidemic (Conner, 2014), being one of the major health threats. The research supports the idea that prolonged stress at work affects employee performance and leads to general health deficiencies or even exhaustion (Kahn & Byosiere, 1992; Ozkan & Ozdeveciogölu, 2013). Although burnout is not considered an autonomous disease in the International Disease Classification, but only a factor of influence, it has become a global concern and has been recognized as a major issue for policy makers of health care and a challenge for the performance of organizations (Bondac G. T., Hrestic M. L., 2017).

A topic that begins to receive particular attention in the context of stress is the use of new information and communication technologies (NICT) at work. NICT penetrates virtually all areas of life into modern societies, becoming an essential part of both leisure and working time (Chesley, Moen, & Shore, 2003, Day, Scott, & Kelloway, 2010) and providing considerable benefits for Employers, workers, but also for society in general (Mamaghani, 2006; O'Driscoll, Brough, Timms, & Sawang, 2010). However, NITC can also be an additional source of stress, leading to health deficiencies (DERKS, Zece Brummelhuis, Zecic, & Bakker, 2012; Harris, Marett, & Harris, 2011; Matusik & Mickel, 2011 Ragu-Nathan, Tarafdar, & Ragu- Nathan, 2008; Thome'e, Eklo¨f, Gustafsson, Nilsson, & Hagberg, 2007). There is still insufficient research on the benefits and drawbacks of NITC use at work, especially with regard to the possible negative effects of technology on employee health and well-being (Popescu C., Iacob S. E., Ilie O.-M., 2015; Day et al, 2010, Derks, Van Mierlo, & Schmitz, 2014; Diaz, Chiaburu, Zimmerman, & Boswell, 2012).

The overall purpose of this research is to examine qualitatively both positive factors and overloading NICT use within organizations.

1. Theoretical foundation

Given the growing interest in positive psychology (Seligman & Csikszentmihalyi, 2000), this research focuses not only on NICT as a workplace stressor, but also on its positive characteristics. In this context, the study is based on the Demand-Resource model (JD-R

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model) (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). The premise of the model is that, regardless of the type of occupation, working conditions can be divided into job applications and job resources. Job applications are aspects of a job that may require sustained and/ or psychological physical effort and are associated with certain physiological and / or psychological, social or organizational costs. Job resources indicate the physical, psychological, social or organizational aspects of a job that can reduce job demands and can play a key role in achieving work goals by promoting personal development (Bakker & Demerouti, 2007; Demerouti et al., 2001).

Regarding burnout in particular, the model assumes that the risk of exhaustion is greatest in working environments where demand for jobs is high and job resources are limited (Demerouti et al., 2001). Consequently, Bakker, Demerouti and Euwema (2005) found that high job demands and limited job resources lead to higher levels of exhaustion.

In fact, it has been found that job resources are particularly relevant under stress conditions (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007). These findings support the importance of job resources in promoting employee health.

Although initially did not take the JD-R model into account, scientists agree that NICT can also be divided into demands and resources (Patel, Ryoo, & Kettinger, 2012). This is because NICT can provide potential benefits, but also additional staffing demands. The ability to be accessed via wireless devices that are independent of location and time can transform work structures into some flexible working time (Cousins & Robey, 2015; Diaz et al., 2012; Jarvenpaa & Lang, 2005).

However, constant accessibility could cause permanent interruptions from phone calls, text messages, or emails. Sellberg and Susi (2014) noted in their observational study that by constantly using NICT throughout the day can force employees to work faster and more to meet deadlines.

Accessibility, regardless of location and time, can also promote compulsive checking of calls, text messages or emails (Lee, Chang, Lin, & Cheng, 2014), creating expectations for faster responses (Mazmanian, Yates, & Orlikowski, 2006; Park, Fritz, & Jex, 2011).

2. NICT, stressors and benefits

Therefore, employees can use NICT for their own personal advantage. Moreover, the previous literature noted that the workspace interferes with private life, thus causing a conflict at work (Diaz et al., 2012). Current results suggest an increase in permeability as a result of technological progress in the workplace, which can also help employees to better balance work and private life, possibly improving long-term welfare (Popescu C., Iacob S. E., Ilie O.-M., 2015). Therefore, separating private life from work can not be the solution to lessening technology-induced stress. These findings have been classified as increased flexibility. In summary, the results confirm the idea that NICT can be perceived as beneficial in working life, providing improved communication processes, instant access to site-independent information and device, as well as increased flexibility in working time and place work.

This exploratory qualitative study, examining the stress factors (Hrestic M. L., Bondac G. T., 2016) and benefits of using NITC at work (Popescu C., Ilie O.-M., 2016), confirmed the hypothesis that NICT is perceived to be both beneficial and harmful (Figure 1), supporting the idea that NICT is a two-edged sword (Diaz Et al., 2012; Patel et al., 2012). The stressful categories of stress are constant availability, connectivity pressure, inward availability, and increased workload, while better communication, instant accessibility, and increased flexibility are advantages of using technology.
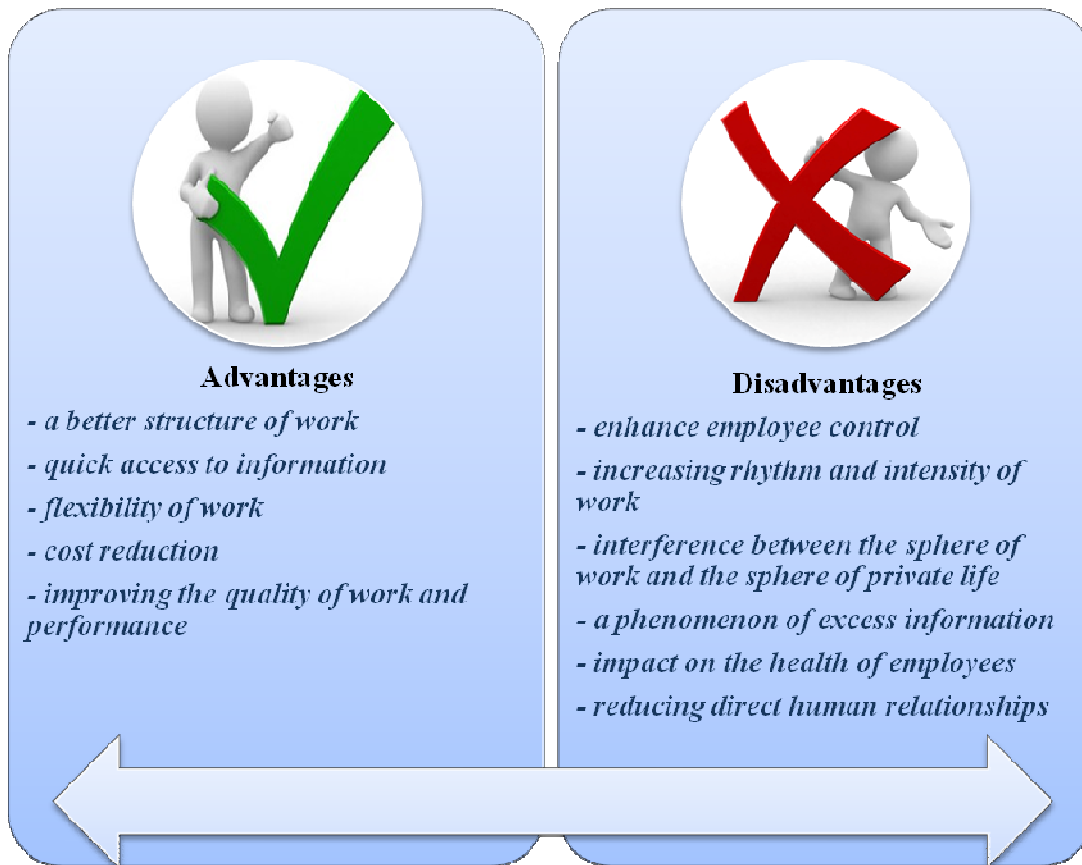
Figure 1. *The advantages and disadvantages of using NICT in organizations*
Source: Processed after Popescu C., Iacob S. E., Ilie O.-M. (2015), NICT – A Means of Increasing
Organizational Performance, Valahian Journal of Economic Studies, Volume 6, Issue 4, ISSN-L 2067-9440 /
ISSN 2344-4924, pp. 19-29,
http://www.vjes.eu/images/2015/issue4/%205.vjes%20vol.%206%2020%20issue%204%202015_popescu.pdf

It is obvious that the aspect of availability is perceived at the same time as a stress factor and a benefit. NICT enables instant availability through wireless devices, whether employees are in a meeting or off-office programming, thus facilitating communication and coordination processes as well as sharing information.

In most organizations, instant messaging applications have become an integral part of employees' work lives and communication processes have changed to allow for a quick and simplified sharing of just-in-time information.

In addition, employees can access relevant time or location-independent business information with mobile devices, allowing for effective control of the flow of information, increasing production time and being informed about ongoing work.

The current study indicates that the increasingly vague boundaries between the private sphere and the workplace as a result of the use of developing technologies can actually create an opportunity in terms of work flexibility.

These benefits help to improve employees' work efficiency and work capacity and can thus contribute to their welfare. However, being immediately available inside and outside the office also means that employees are continuously available to colleagues, supervisors, or clients through technologies (Chart 1).
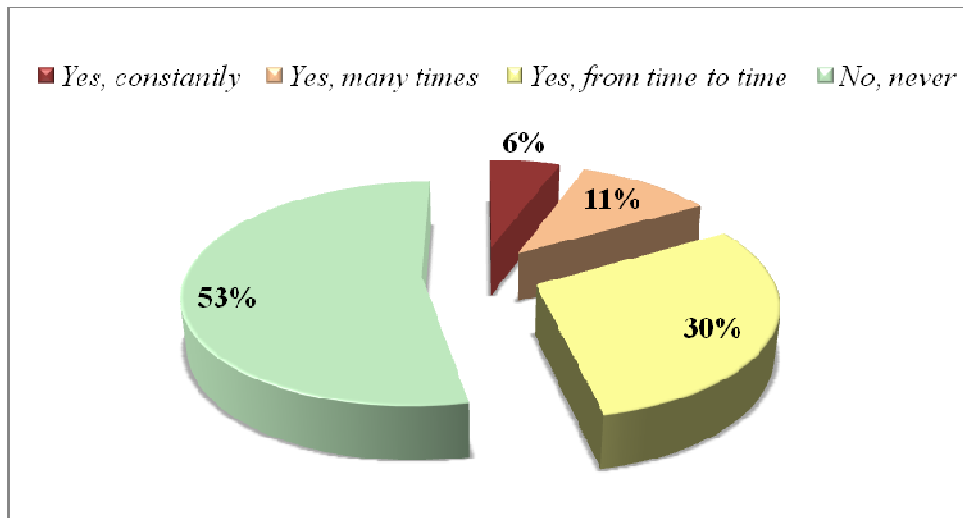
Chart 1. **The extent to which employees are required to check out workplace messages outside work hours**

Source: Processed after « Bien-être au travail ou technostress ? » Une enquête du Service d'Etudes de la FGTB, BRUXELLES, LE 23 AVRIL 2013, http://www.fgtb.be/documents/20702/177858/Bien-%C3%AAtre+au+travail+ou+technostress-FGTB23042013.pdf/c1db226c-5718-473d-b353-765c01513360, accesed on 25.09.2017, at 11:35.

In this context, the results of the study suggest that NICT allow for constant interruptions in work processes inside and outside the office, extending work beyond normal working hours and increasing response expectations, all with the ability to increase stress at The workplace being additional pressure on employees. Consistent with previous results, constant connectivity at the workplace can lead to an increase in decoupling (Barber & Jenkins, 2014, Boswell & Olson-Buchanan, 2007, Mazmanian et al., 2006, Park et al., 2011).

In particular, the provision of technological devices by the employer may increase the availability pressure, whether or not this is expected. Fenner and Renn (2010) found that an organizational climate that stimulates the performance of extra-work at home behavior with the help of technology can actually be interpreted by people as a social pressure to expose this type of behavior. The findings presented in this study also indicate that employees may feel compelled to be accessible at any time for colleagues, supervisors, or customers due to a general expectation of constant availability through technology devices and applications (Chart 2).
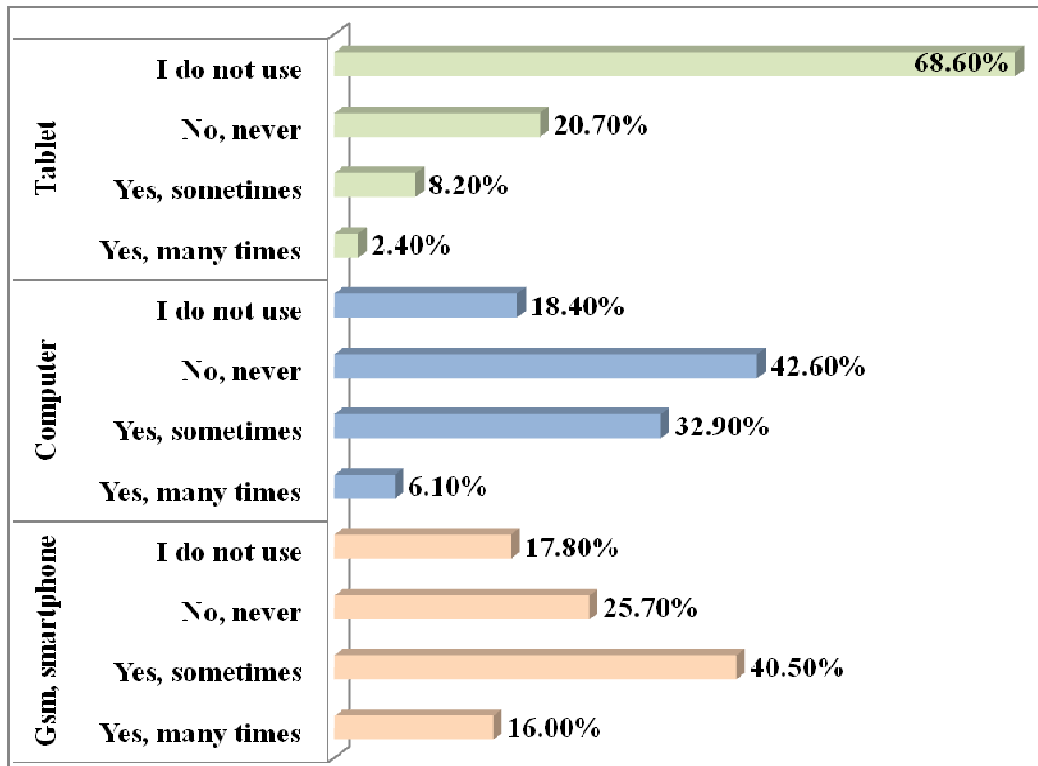
Chart 2. **Stress-generating tools for employees outside working hours**
Source: Processed after « Bien-être au travail ou technostress ? » Une enquête du Service d'Etudes de la FGTB,
BRUXELLES, LE 23 AVRIL 2013, http://www.fgtb.be/documents/20702/177858/Bien-
%C3%AAtre+au+travail+ou+technostress-FGTB23042013.pdf/c1db226c-5718-473d-b353-765c01513360,
accesed on 25.09.2017, at 11:35.

Therefore, the use of NICT contributes to the increase of employees' work capacity and productivity. However, employers and employees should not overlook the fact that the introduction of NICT in the workplace comes with a cost, which is an additional source of stress in the workplace. NICT thus increase the risk of undergoing prolonged stress, which may have adverse effects on employee health.

Conclusions

This research could provide valuable information on promoting employee health and provide an appropriate basis for the development of interventions and preventative measures at the organizational level that could help reduce the stress generated by the use of new technologies at work. These measures can further help reduce occupational stress and its negative consequences and increase welfare and employee satisfaction.

Organizations may wish to develop and implement appropriate corporate guidelines on the use of NICT in the workplace, in order to reduce the technology-induced stress. These could also include internal communication within the company, knowing that technologies can be a major factor in work-life stress.

Implementing interventionist and preventive measures could help reduce the risk of stress at work while taking advantage of the benefits of using NICT. Such measures are considered important because technology can be a crucial issue in relation to work environment stress and general health of employees.

Limitations and future research directions

The use of NICT should provide sufficient grounds for further exploration of the effect on employee health. In view of the results of the study, it would be particularly interesting to examine whether the effect of using NICT on employee welfare depends on whether the use of NICT is more perceived as an opportunity for a better work-life balance or more than a cause for A conflict between areas of life. This hypothesis is supported by the increase in awareness that burnout should no longer be treated as an exclusively work-related phenomenon but as a result of the complex interaction between work and non-work experiences (Grzywacz, Almeida & McDonald, 2002; Lingard, 2004). Therefore, it is assumed that the perceived effect of using NICT on the reconciliation of work and private life moderates the effect on the health of employees.

Future research could also focus on the possible gender differences in individual experiences related to the use of NICT in general, as well as the perception of technology-induced stress, in particular.

Digital "digital natives" also have different perceptions about the stresses generated by new technologies and benefits compared to "digital immigrants" who grew up in a computerless and Internet environment (Prensky, 2001). In addition, other socio-demographic factors such as education or whether an employee has children, as well as the age of children, could influence the perception of NICT as stressors or benefits from their use at work.

Bibliography

1. Bakker, A. B., & Demerouti, E. (2007). *The job demandsresources model: State of the art*. Journal of Managerial Psychology, 22(3), 309328.
2. Bakker, A. B., Hakanen, J. J., Demerouti, E., & Xanthopoulou, D. (2007). *Job resources boost work engagement, particularly when job demands are high*. Journal of Educational Psychology, 99(2), 274284.
3. Barber, L. K., & Jenkins, J. S. (2014). *Creating technological boundaries to protect bedtime: Examining workhome boundary management, psychological detachment and sleep*. Stress and Health, 30(3), 259264.
4. Bondac G. T., Hrestic M. L. (2017), *Burnout Syndrome – Theoretical Aspects*, Revista Economia Contemporana, Vol. 2, Nr. 2, ISSN 2537 – 4222, ISSN-L 2537 – 4222, Piteşti, pp. 119-124, http://www.revec.ro/images/images_site/articole/article_8d03dad008a44253055c8d221c165ba4.pdf
5. Boswell, W. R., & Olson-Buchanan, J. B. (2007). *The use of communication technologies after hours: The role of work attitudes and work-life conflict*. Journal of Management, 33(4) 592610. doi: http://dx.doi.org/10.1177/0149206307302552
6. Chesley, N., Moen, P., & Shore, R. P. (2003). *The new technology climate*. In P. Moen (Ed.), It's about Time. Couples and careers (pp. 220224). Ithaca, NY: Cornell University Press.
7. Conner, C. (2014, October 23). *The job stress epidemic is making us sick*. Forbes. Retrieved February 16, 2015, from http://www.forbes.com/sites/cherylsnappconner/2014/10/23/the-job-stress-epidemic-is-making-us-sick/
8. Cousins, K., & Robey, D. (2015). *Managing work-life boundaries with mobile technologies*. Information Technology & People, 28(1), 3471.
9. Day, A., Scott, N., & Kelloway, E. K. (2010). *Information and communication technology: Implications for job stress and employee well-being*. In P. L. Perrewe' & D. C. Ganster (Eds.), New developments in theoretical and conceptual approaches to job stress (pp. 317350). Bingley: Emerald Group.

10. Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). *The job demands-resources model of burnout*. Journal of Applied Psychology, 86(3), 499512.
11. Derks,D.,Ten Brummelhuis, L. L.,Zecic,D.,&Bakker, A.B. (2012). *Switching on and off : Does smartphone use obstruct the possibility to engage in recovery activities?*. European Journal of Work and Organizational Psychology, 23(1), 8090.
12. Diaz, I., Chiaburu, D. S., Zimmerman, R. D., & Boswell, W. R. (2012). *Communication technology: Pros and cons of constant connection to work*. Journal of Vocational Behavior, 80(2), 500508.
13. Fenner, G. H., & Renn, R. W. (2010). *Technology-assisted supplemental work and work-to-family conflict: The role of instrumentality beliefs, organizational expectations and time management*. Human Relations, 63(1), 6382.
14. Grzywacz, J. G., Almeida, D. M., & McDonald, D. A. (2002). *Work-family spillover and daily reports of work and family stress in the adult labor force*. Family Relations, 51(1), 2836.
15. Harris, K. J., Marett, K., & Harris, R. B. (2011). *Technology related pressure and work family conflict: Main effects and an examination of moderating variables*. Journal of Applied Social Psychology, 41(9), 20772103.
16. Hrestic M. L., Bondac G. T. (2016), *The Factors Influencing Organizational Stress*, Supplement of Quality - Access to Success Journal, Vol. 17, ISSUE S2, ISSN 1582-2559 (electronic format, on CD-ROM), a CNCSIS cited category B+ and indexed BDI into the international databases: SCOPUS, EBSCO, CABELL'S, PROQUEST, la pp. 79-84, http://search.proquest.com/docview/1793541320?pq-origsite=gscholar
17. Lee, Y.-K., Chang, C.-T., Lin, Y., & Cheng, Z.-H. (2014). *The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress*. Computers in Human Behavior, 31, 373383.
18. Lingard, H. (2004). *Work and family sources of burnout in the Australian engineering profession: Comparison of respondents in dual- and single-earner couples, parents, and nonparents*. Journal of Construction Engineering & Management, 130(2), 290298.
19. Mamaghani, F. (2006). *Impact of information technology on the workforce of the future: An analysis*. International Journal of Management, 23(4), 845850.
20. Matusik, S. F., & Mickel, A. E. (2011). Embracing or embattled by converged mobile devices? Users' experiences with a contemporary connectivity technology. Human Relations, 65(8), 10011030.
21. Mazmanian, M., Yates, J., & Orlikowski, W. (2006). *Ubiquitous email: Individual experiences and organizational consequences of BlackBerry use*. Academy of Management. Proceedings of the 66th AnnualMeeting of theAcademy ofManagement.Atlanta,GA. Ministry for Social Affairs. (2013). Amendment of the Austrian occupational health and safety act: 2013 (ASchG-Novelle). Retrieved November 5, 2014, from http://www.arbeitsinspektion. gv.at/AI/Gesundheit/Belastungen/005_aschg_novelle_2013.htm
22. O'Driscoll, M. P., Brough, P., Timms, C., & Sawang, S. (2010). *Engagement with information and communication technology and psychological well-being*. In P. L. Perrewe´ &D.C.Ganster, (Eds.), New developments in theoretical and conceptual approaches to job stress (pp. 269316). Bingley: Emerald Group.

23. Ozkan, A., & Ozdeveciog˘lu, M. (2013). *The effects of occupational stress on burnout and life satisfaction: A study in accountants*. Quality & Quantity, 47(5), 27852798.

24. Park, Y., Fritz, C., & Jex, S. M. (2011). *Relationships between work-home segmentation and psychological detachment from work: The role of communication technology use at home*. Journal of Occupational Health Psychology, 16(4), 457467.

25. Patel, J., Ryoo, S., & Kettinger, W. (2012). *Theorizing the dual role of information technology in technostress research*. AMCIS 2012 Proceedings, Paper 12. Retrieved November 19, 2014, from http://aisel.aisnet.org/amcis2012/proceedings/EndUserIS/12/

26. Popescu C., Iacob S. E., Ilie O.-M. (2015), *NICT – A Means of Increasing Organizational Performance*, Valahian Journal of Economic Studies, Volume 6, Issue 4, ISSN-L 2067-9440 / ISSN 2344-4924, pp. 19-29, http://www.vjes.eu/images/2015/issue4/%205.vjes%20vol.%206%2020%20issue%204%202015_popescu.pdf

27. Popescu C., Ilie O.-M. (2016), *The Economic, Social and Ethical Aspects of using NICT in Organizations*, Valahian Journal of Economic Studies, Volume 7, Issue 3, ISSN-L 2067-9440 / ISSN 2344-4924, pp. 83-91, http://www.vjes.eu/index.php/archive/94-2016/127.html

28. Prensky, M. (2001). *Digital natives, digital immigrants*. On the Horizon, 9(5). Retrieved August 25, 2015, from http://www.marcprensky.com/writing/Prensky - Digital Natives, Digital Immigrants - Part1.pdf

29. Ragu-Nathan, T. S., Tarafdar, M., & Ragu-Nathan, B. S. (2008). *The consequences of technostress for end users in organizations: Conceptual development and empirical validation*. Information Systems Research, 19(4), 417433.

30. Seligman, M. E., & Csikszentmihalyi, M. (2000). *Positive psychology: An introduction*. American Psychologist, 55(1), 514.

31. Sellberg, C., & Susi, T. (2014). *Technostress in the office: A distributed cognition perspective on humantechnology interaction*. Cognition, Technology & Work, 16(2), 187201. doi: http://dx.doi.org/10.1007/s10111-013-0256-9

32. Thome´e, S., Eklo¨f, M., Gustafsson, E., Nilsson, R., & Hagberg, M. (2007). *Prevalence of perceived stress, symptoms of depression and sleep disturbances in relation to informationand communication technology (ICT) use among young adults: An explorative prospective study*. Computers in Human Behavior, 23(3), 13001321.