4

TASK-TECHNOLOGY FIT THEORY

An approach for mitigating technostress

Nelda Vendramin, Giulia Nardelli, and Christine Ipsen*

1 Background

1.1 Task-technology fit

The task-technology fit (TTF) theory postulates the relationship between digital technology (hereafter technology) and the tasks it aims to support. TTF is a variance theory describing the interrelationship between three components – technology functionality, task requirements, and individual abilities – at a specific point in time (Goodhue, 1995; Goodhue & Thompson, 1995).

The TTF perspective stems from information systems research (e.g., Bere, 2018; Gebauer, Shaw, & Gribbins, 2010; Vanduhe, Nat, & Hasan, 2020) and has been applied in different domains. For example, knowledge work (Kuo & Lee, 2011), managerial decision-making (Goodhue, Klein, & March, 2000), team performance (Fuller, 2009), virtual teams (Zigurs & Khazanchi, 2008), and education (McGill & Klobas, 2009). The concept of task-technology fit was developed by Goodhue and Thompson (1995) and Zigurs and Buckland (1998). While Goodhue and Thompson (1995) focus on the fit between the technology, task, and individual, Zigurs and Buckland (1998) place the focus on how task and technology interact to enhance group performance.

Goodhue (1995) and Goodhue and Thompson (1995) proposed the TTF as an evaluation construct defined within a theoretical perspective, which assesses certain aspects of technology and seeks to understand how the use of technology affects performance impacts. The TTF perspective assumes that users can appropriately evaluate the level of TTF as they use the technology for performing their work tasks, and that an evaluation of TTF may predict the performance. TTF is measured through assessment of user experience based on different dimensions such as quality of data, usability, and reliability of the technology. However, the assumption is that users evaluate both the functionality of the technology and the degree to which the technology assists them in task accomplishment and suits their abilities (Dishaw, 1999).

According to TTF theory, a higher fit between technology, task requirements, and individual abilities will contribute to a better performance, that is, will lead to more efficient task accomplishment (Goodhue, 1995). When users acknowledge that technology improves the execution of a task, it leads to higher adoption and use and, in turn, to improved performance (Figure 4.1).

*Corresponding author: neol@dtu.dk

Figure 4.1 Interacting elements of TTF

The improved performance arises from an optimal TTF: when technology matches the task characteristics it aims to support and the individual abilities of the users, users may execute their tasks more smoothly (Lee, Cheng, & Cheng, 2007; Spies, Grobbelaar, & Botha, 2020).

Figure 4.1 illustrates the interacting elements of TTF. The task requirements represent the physical and cognitive actions individuals carry out to turn inputs into outputs in a specific environment (Goodhue, 1995; Goodhue & Thompson, 1995). A task may contain different levels of detail and requirements relating to the technology supporting the task. The technology functionality element refers to the tools that individuals use to perform tasks or use to assist them in performing their tasks. Technologies may include computer systems (hardware, software, and data) and support services (training, HR policies, and IT support). The technology functionality relates to the environment where technology is used and what tasks it aims to support. This is the moderating element, as to achieve an improved performance the individuals need to use the technology to perform the task. Furthermore, the individual abilities represent the different characteristics of an individual that may influence how proficiently they use the technology to perform work tasks. This element relates to a person's internal resources, for example motivation, experience, and training in the use of different technologies (Goodhue & Thompson, 1995).

The TTF component refers to the level to which technology assists users in accomplishing their work tasks. The task requirements, technology functionality, and individual abilities contribute to the level of TTF. The performance impacts represent the task accomplishment of an individual. A higher performance assumes a mixture of improved efficiency and effectiveness, and/or improved overall quality of the outputs (Goodhue & Thompson, 1995).

1.1.1 Utilisation

Figure 4.1 represents the basic relationship between task, technology, individual abilities, task-technology fit, and performance, yet it does not involve the utilisation construct. Goodhue and Thompson (1995) suggest that the TTF perspective may gain from combining the TTF focus with utilisation, as this combination would allow pinpointing relevant aspects of technology impacts influencing the performance. Focusing solely on TTF excludes that technology needs to be used before reaching performance impacts, whereas focus placed only on utilisation would limit the understanding on how the technology influences performance (Goodhue & Thompson, 1995).

However, utilisation is a complex aspect as elements other than TTF may influence it, and it may differ across organizations. Utilisation refers to the user behaviour, that is, frequency of use and the diversity of functionality applied when accomplishing tasks using a certain technology, and it considers user attitudes and beliefs when predicting the use of the technology. However, increased utilisation does not equal better performance. For example, utilisation of an

unsupportive technology may still occur due to habits, social norms, ignorance, and other factors affecting the users, even when the use of technology is voluntary. Frequently, the utilisation of technology is a requirement of the job function rather than due to its functionality. In these situations, the utilisation construct does not need consideration as the performance impacts will highly depend on the TTF. A higher level of TTF may increase utilisation and lead to improved performance because the technology meets the needs of the task and the individual (Goodhue & Thompson, 1995). On the contrary, in situations where the fit is poor and the technology does not support users while accomplishing tasks, the individuals will face distress and frustration with their performance (Goodhue, 1995). The inability to accomplish work tasks effectively when using technology may lead to distress tied to technology use, in other words, technostress (Ayyagari, Grover, & Purvis, 2011).

Research has attempted to extend and combine the TTF model with other models to explain utilisation. For example, TTF has been extended using attitude and behaviour models which intend to explain user acceptance of technology (Kuo & Lee, 2011). Dishaw (1999) suggests combining TTF with the technology acceptance model (TAM). While the two perspectives have overlapping properties, the TAM perspective focuses on user attitudes (i.e., perceived usefulness and ease of use) towards the use of a specific technology, which the TTF perspective does not consider. On the other hand, TTF includes a view on task characteristics, which the TAM perspective excludes. The combination of TTF and TAM may offer a more comprehensive understanding of the user attitudes towards a specific technology and the fit between technology functionality and the characteristics of the tasks than each of these perspectives taken separately (Dishaw, 1999). The combined perspectives have been widely used in research (e.g., Shih & Chen, 2013; Pagani, 2006).

Furthermore, Strong, Dishaw, and Bandy (2006) argue for extending the TTF with a computer self-efficacy construct (CSE), where CSE is added as an individual characteristic. As a result, combining CSE and TTF would increase the explanatory power related to the utilisation of a specific technology. While the TTF perspective considers individual characteristics, CSE is linked to computer literacy (Strong et al., 2006). However, individual characteristics involve other aspects, for example experience, innovativeness, creativity, and willingness to try new things. The suggested CSE construct refers to an individual's judgement of own ability and competence when employing technology (Compeau, 1995) and claims that the users' judgement influences the utilisation of the technology (Strong et al., 2006). For example, a higher self-efficacy means that the individual has a high perception of their ability and might imply that the individual is willing to place more effort in task completion. Low self-efficacy, on the other hand, might affect the performance negatively and contribute to experiencing technostress.

1.2 Technostress

Technostress conceptualises the distress associated with the need to adapt to and use new digital technologies (Brod, 1984; Gaudioso, Turel, & Galimberti, 2017; Vuori, Helander, & Okkonen, 2019). Elevated technostress may contribute to dissatisfaction at work, job burnout, and poor performance (Fuglseth & Sørebo, 2014; Gaudioso et al., 2017). Technostress stems from the presence and severity of factors contributing to technostress (i.e., techno-stressors), which to some degree are present in all organizations that engage technologies in accomplishing work tasks (Gaudioso et al., 2017; Srivastava, Chandra, & Shirish, 2015). Techno-stressors – factors that contribute to technostress – are

- 1 Techno-invasion, i.e., mixing work and private time due to technology-supported connectivity.
- 2 Techno-overload, i.e., demands on working more and faster when using technology.

- 3 Techno-complexity, i.e., steeper learning curve due to multifaceted and continuously changing technology.
- 4 Techno-insecurity, i.e., nervousness and insecurity in using and interacting with technologies due to lack of experience and training.
- 5 Techno-uncertainty, i.e. technology adoption in an organization leading to process reorganization or job replacement.

(Gaudio et al., 2017; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007)

Even though using technology may contribute to technostress, achieving an optimal fit between the technology functionality, tasks, and individual abilities would alleviate it (Ayyagari et al., 2011). Technology that enables individuals at work and promotes employee self-motivation and well-being will boost productivity and job satisfaction (Cascio & Montealegre, 2016). On the contrary, in situations where the TTF is poor and technostress is present, individuals may engage in a coping process to minimise the distress. Transactional theory of stress and coping explains the process of appraisal and coping.

1.3 Transactional theory of stress and coping

The transactional theory of stress and coping (TTSC) explains the dynamic interplay of appraisal and coping processes when dealing with a situation where the placed demands are higher than the individuals' capacities to deal with them (Lazarus, 1966; Lazarus & Folkman, 1984; Lazarus & Folkman, 1987). The TTSC is among the most influential stress theories and has been applied in areas such as occupational safety and health (Brough, Drummond, & Biggs, 2018), organizational change (Rafferty & Griffin, 2006), organizational performance (Li, Chen, & Lai, 2018), and work organization (Espedido, Searle, & Griffin, 2020).

According to the TTSC, stress emerges in interactions between individuals and the environment. When an individual has trouble dealing with the demands, the interaction may cause a stress response. On the contrary, if an individual appraises the demands as manageable, they do not experience a stress response. The stress response lies in the individuals' subjective interpretation and in their ability to cope with the situation (Lazarus, 1966; Lazarus & Folkman, 1984; Lazarus & Folkman, 1987).

As presented in Figure 4.2, when the environment, for example the workplace, places demands that the individual perceives as too troublesome, their primary appraisal evaluates them as a potential threat to their well-being. The assessment of a potential threat engages the secondary appraisal, where the individual evaluates options for dealing with the situation. Depending on the appraisal, individuals experience a different emotional response, such as anger, worry, or excitement. The primary appraisal continuously informs the secondary appraisal and vice versa.

To respond to the environmental demand and minimise stress, individuals engage in a coping process informed by the secondary appraisal. In some situations, coping may not lead to an outcome or may take a maladaptive form. If individuals cannot reach an outcome, they may engage in a reappraisal process where they reframe their viewpoint on the demands, or otherwise, the individual may need external support such as training or coaching.

1.3.1 Coping with unsupportive technology

If individuals perceive the technology to be unsupportive in their task accomplishment and, as a result, impeding their work outcomes, they may face distress and appraise the situation as a

Figure 4.2 Elements and processes in the TTSC

potential threat to their well-being at work (Fuglseth & Sørebo, 2014). In turn, the perception of a threat will initiate the coping process to alleviate distress.

The appraisal of a threat is more likely in those situations in which individuals have assigned high personal significance yet have low control over the circumstances (e.g., cannot accomplish work tasks other than by using the specific technology, see also Chapter 11 Two-Process Theory of Perceived Control). Dissatisfaction and the appraisal of a threat may trigger an emotional response, such as fear, worry, anxiety, and anger. On the contrary, if individuals assign high personal significance yet have high control (e.g., can select other means for accomplishing tasks),

the situation is appraised rather as a challenge and individuals instead may experience feelings of excitement and eagerness (Folkman, 2013; Lazarus & Folkman, 1987).

The appraisal of a threat, challenge, or harm initiates coping behaviours, that is, individuals exhibit behavioural and emotional effort to find potential options and resources for dealing with the demanding situation (Gaudioso et al., 2017; Lazarus & Folkman, 1984; Tarafdar et al., 2007). Coping can take adaptive or maladaptive forms. For example, reaching out to colleagues to ask for help in learning the functions of the unsupportive technology classifies as adaptive coping. Whereas avoiding the use of technology, complaining, and blaming others classify as maladaptive coping (Gaudioso et al., 2017). The way individuals cope depends on their psychological, social, environmental, and material resources, as well as on the nature of the situation, and whether the individual has control over the outcomes or has to accept what is happening (Folkman, 2013).

When engaging with unsupportive technology, individuals may use different coping strategies. There are three main types of coping – problem-focused, emotion-focused, and meaning-focused – that individuals apply in troublesome situations (Folkman, 2013; Lazarus & Folkman, 1987). Problem-focused coping attempts to alter the situation, emotion-focused coping seeks to regulate emotions, and meaning-focused coping concerns situations that cannot be changed and require reappraisal, that is, accepting the circumstances or seeking to have a more positive outlook (see Table 4.1). People tend to use multiple coping strategies interchangeably and at the same time, and tailor them to a specific task or goal to reach the desired outcome. Coping is contextual, and the ways of coping may change over time as a situation evolves in the environment or due to internal changes (Folkman, 2013; Lazarus, 1993).

The appraisal, coping, and reappraisal processes persist until the stressful situation is addressed, resolved, or terminated (Gage, 1992) or the individual has reassessed the situation and reframed thoughts about the demands (i.e., sees the situation in a different light) to reframe the emotional impact (Gross, 1998; Troy, 2013). This sequence repeats once another stressful event is anticipated or encountered. These processes vary from one person to another due to differences in their internal and external resources, for example one person may perceive working with an unsupportive technology as more stressful than another may perceive it, even when the occurring situation is the same for both (Ipsen & Jensen, 2012). The outcome of the appraisal and

Table 4.1 Overview of coping types

	<i>Problem-focused coping</i>	<i>Emotion-focused or cognitive coping</i>	<i>Meaning-focused coping</i>
Purpose	To change the relationship between the affected person and the environment	To regulate emotional distress	To sustain well-being
Adaptive and maladaptive strategies	Information gathering, learning, advice seeking, relying on previous experiences, negotiation, problem-solving, intellectualisation	Distancing, humour, seeking social support, avoidance, denial, escaping the situation, resignation, blaming others, venting, aggression, suppression	Focusing on values, beliefs, and goals, reappraising situations more positively, appreciating positive moments daily
Use	Controllable situations	Situations that have to be accepted	Situations that are chronic and not resolvable

Table 4.2 Approaches to stress interventions

<i>Level</i>	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>
Goal	Removing risk factors leading to stress and/or reducing the intensity of the risk factors	Helping employees to modify challenges and understand how to respond to stress symptoms	Treating stress and reducing damaging consequences by helping to cope efficiently
Focus	Organization	The interplay of individual and organization	Individual
Examples	Redesign in work processes, alterations in the work environment, supportive processes, new incentive systems, role clarification, recognition	Stress management, wellness programs, training in coping strategies	Return-to-work programs, therapy, counselling, medicine

Source: (Cooper, Dewe, & O'Driscoll, 2001)

copied for a particular person in one situation may predict their appraisal and coping tendencies in another situation (Folkman, 2013).

Dedicated stress interventions can help individuals cope with the demands placed upon them and prevent and minimise work-related stress, including technostress (Ipsen & Jensen, 2012). Prevention of work-related stress includes three levels (see Table 4.2). Primary intervention strategies focus on organizational changes and are the most appropriate when aiming to reduce work-related stress with a long-term preventative approach. Secondary strategies seek to adjust to challenges by acting on the interplay between individuals and organizations. Finally, tertiary intervention strategies are reactive as they focus on fixing stress outcomes instead of acting upon the basic organizational stressors.

2 Applicability to workplace studies

The introduction of new digital technologies has offered possibilities for finding new ways of working, new products, and services. Digital technologies allow knowledge workers to work flexibly and remotely thanks to practices such as telework, commuter hubs, and virtual teams, by combining distance work and management across time and geography. While a well-designed and -managed flexible and remote workplace can have a positive influence on employee well-being (Arnold et al., 2016; Dickson-Swift, Fox, Marshall, Welch, & Willis, 2014; Hoeven & Zoonen, 2015), the ability to implement new work practices is not always straightforward. When not managed appropriately, flexible and remote workplaces can be a source of work-related stress and harm individuals, organizations, and the economy as a whole through, for example, productivity losses, presenteeism, and absence (Arnold et al., 2016; Cooper et al., 2001; Ipsen, Karanika-Murray, & Nardelli, 2020). Furthermore, the lack of exploration of the TTF may contribute to wasted resources on underutilised technology (Dishaw, 1999).

On the one hand, the TTF theory aims to support organizations in investigating the factors affecting the effective adoption of technology they are planning to implement in their organization. Workplace management researchers have also employed the theory to investigate how to implement, manage, and maintain technology with positive results in terms of organizational performance and individual well-being (e.g., Cameron & Webster, 2005; Chen, Zhao, Zhang, Wang, & Guo, 2015; Hung, Duyen, Kong, & Chua, 2008).

On the other hand, workplace research can apply the TTSC in assisting individuals and equipping them with skills and resources that would allow them to cope better with stressors at work. Across professions, individuals experience different demands that affect their well-being with consequences for their psychological and physical health. These demands may relate to high workload, tight deadlines and time pressure, working with complicated or unsupportive technology, the blurring of boundaries between work and private life due to constant connectivity, the level of control in one's job, and relations to colleagues and organizational climate, which are all potential stressors. The heterogeneity in the stressors that different professions experience is related to the characteristics of the tasks they need to perform and of the overall work situation.

The TTSC explains why some individuals are more effective than others are when dealing with environmental demands. However, while people tend to have different responses to demands, organizations are responsible for providing support and training in both technology use and adaptive coping strategies to reach more positive work outcomes. Therefore, we propose to apply and test the conceptual framework in Figure 4.3 through action research to investigate how organizations do and should handle technostress. To do so, workplace action researchers should start by identifying the risk of technostress in the workplace they are investigating. They should then investigate the nature and significance of technostress within each context to generate scientific insight on technostress management. At the same time, workplace action researchers should develop concrete interventions with organizations to provide technical support and training workshops, while cultivating collaboration and knowledge sharing among team members.

While the TTSC focus on the individual responses to stress, the TTF theory focuses on establishing a fit between the task, the technology, and its users. Therefore, by combining the two theories, we propose to take an organizational perspective to investigate how organizations can prevent technostress independently of individuals' ability to cope with it. Furthermore, we propose to adopt a collaborative approach to test how the combined theories help to deal with workplace management issues, such as technostress. In combination, the TTF theory and TTSC can help to investigate the implementation of new technologies in workplaces to minimise technostress (Figure 4.3).

In Figure 4.3, the implementation of new technology in a workplace creates a demand in the interactions between the environment (workplace) and the individual (employee). If the use of the new technology is crucial for employees to perform and accomplish tasks (their primary appraisal may detect a potential threat, and they may feel threatened or challenged by the change or it may remind them of a loss experienced in the past) (Arnold et al., 2016; Mayes & Ganster, 1988). For example, employees may foresee the specific demands that the new technology places on them (i.e., techno-stressors) and struggle to cope with both the requirements and the advancing technologies, thereby experiencing technostress (Mahapatra & Pillai, 2018).

3 Methodology/research approach: action research

Research within applied areas such as workplace research embeds the complexity of the practical world of organizations and people. Applied researchers thus face the challenge of finding appropriate ways to create value for both academia and practice, bridging the gap between scientific validity and practical relevance (Van de Ven, 2007). Action researchers can close this gap by establishing a close collaboration with industry and emphasising real-life issues as research topics (Coughlan, Draaijer, Godsell, & Boer, 2016). Through the active interaction between researchers and practitioners, action research focuses on both facilitating organizational solutions to concrete problems and generating scientific knowledge (Cirella, Guerci, & Shani, 2012).

Figure 4.3 Conceptual framework combining TTF with the TTSC

Action researchers enable system changes and/or support new initiatives in organizations through interventions that they plan and implement together with organizational participants. The role of action researchers is threefold: (1) to facilitate the inquiry process by feeding scientific knowledge into the interventions; (2) to facilitate the ongoing learning process through reflection exercises; and (3) to establish and maintain ongoing engagement with the senior management of the organization (Cirella et al., 2012). Action researchers collect data from multiple sources, from participant observation to interviews and workshops with multiple organizational actors, and interpret them by creating shared meaning with fellow researchers and research participants (Coughlan et al., 2016).

Action researchers participate in collaborative communities with practitioners on equal terms. To develop actionable solutions that are both theoretically and practically relevant through engagement with practice, action research combines theory and practice with action and reflection (Bergman, Hellström, Lifvergren, & Gustavsson, 2015). For example, insider action research involves interventions that either aim at pragmatic outcomes (e.g., the management of change and problem resolution) or at studying the inquiry process to change it (e.g., through increasingly intensive learning in action) (Coughlan, 2001, 2003).

In workplace research, action research can enable combining the TTF with the TTSC theory for studying the effects of implementing new technologies on employee well-being. Combining the two theories in the conceptual framework enables workplace researchers to investigate

how organizational decision-making on new technology implementation affects employee well-being. Yet dedicated empirical research should investigate the processes and interrelationship between variables that we propose in the combined framework as they occur in praxis.

Although emphasising that organizations can influence individual stress and coping processes, the framework that we propose in this chapter does not include change management variables, such as managerial expectations of employee behaviour, communication of demands, and consequent employee reactions. Future workplace research should look at how managerial expectations and communication of demands affect experienced technostress and employee well-being in general. Furthermore, while the chapter emphasises technostress as a workplace issue, this is just one aspect of the work-related stress that knowledge workers experience. Future research should look into the intertwining of technostress with other types of work-related stress and their effects on employee well-being and organizational performance.

3.1 Participatory changes in the daily practices

Involving employees in the research process can promote organizational learning and catalyse change from within an organization (Roskam, 2009; Schnall, Dobson, & Roskam, 2009). Thus, we suggest participatory action research (PAR) as an alternative approach to examining workplaces as opposed to viewing employee health outcomes as the outcome of individual behaviours or as the result of single work tasks or exposures from new technologies.

PAR is an action research approach centred on the interaction between researchers and practitioners. This approach incorporates a systematic effort to generate knowledge about specific conditions that can influence changes in each situation and aims at lessening psychosocial risks in the workplace, especially if they result from managerial and employee disagreements (Dollard, Le Blanc, & Cotton, 2008). PAR involves the participants in all phases of the change project and acts as a suitable method to overcome challenges through a continuous dialogue.

By adopting a PAR approach while investigating how organizational decision-making on new technology implementation affects employee well-being, workplace researchers can strengthen the interaction between researchers and practitioners, generate knowledge that is both valid and relevant, and have a tangible effect on technostress in organizations.

4 Limitations

The main limitation of the TTF theory refers to it addressing the present moment of fit. Tasks may become more demanding over time, and the technology might not have the required functionality to assist the users, which can promote technostress. Since TTF does not address changes over time, it limits the predictive potential of a specific technology in the workplace (Fuller, 2009). As a result, the TTF needs continuous reassessment, yet the optimal frequency of evaluations is not evident.

The appraisal and coping process represented by the TTSC vary from one person to another and may not always be visible and thus recognised. Identifying and recognising the appraisal and coping processes in individuals requires close management attention and the ability to empathise with individuals and their situation. Acknowledging how individuals react to a situation and whether they engage in the coping process may be covert unless shared openly. Coping processes may look different in different situations, which means that it would be presumptuous to assign patterns and assume a certain response informed by the past. Furthermore, coping in a demanding situation may not always be the solution; sometimes there may be a need for management interference to minimise stressors in the workplace.

5 Theory relevance to practice

Knowledge workers largely rely on digital technology use for knowledge sharing, yet managers tend to forget to consider the effects of technologies on employee well-being (Cascio & Montealegre, 2016). The proposed conceptual framework and action research approach can benefit practitioners by highlighting three concrete actions that organizations and workplace managers can implement to prevent and minimise technostress and improve user satisfaction: (1) building awareness, (2) reducing techno-stressors, and (3) embracing adaptive coping mechanisms.

5.1 Building awareness

Organizations should (1) acknowledge that technostress affects individuals and organizations alike, yet in different ways; (2) assess the degree to which technostress is present in their organization, for example by using scale items suggested by Gaudioso et al. (2017); and (3) consider techno-stressors both individually and in combination (Brivio et al., 2018; Gaudioso et al., 2017; Tarafdar et al., 2007). Additionally, managers should pay special attention to people affected by the implementation of new technology in workplaces and design the technology implementation process accordingly. Managers should map employees who use the new technology to accomplish important work tasks, their abilities, and the tasks they need to perform. These employees, in fact, are especially at risk of experiencing technostress as the newly implemented technology directly affects their work.

5.2 Reducing techno-stressors

Although reducing techno-stressors in workplaces may be a difficult task, organizations can implement multiple methods and approaches to minimise technostress effects and support employee well-being. Mitigation strategies include adequate training, assigning time for learning to use new technologies, and providing a high-quality help desk (Fuglseth & Sørensen, 2014). Managers should also consider not overwhelming employees with more new tools to work with at the same time as it may contribute to technostress (Gaudioso et al., 2017).

Furthermore, organizations may consider assessing the fit between the task, the technology, and the individual abilities before implementing new technology in workplaces as well as measuring TTF over time. By applying the TTF theory, organizations can assess the impact of technology and thus foresee employee responses to the new technology. For example, organizations can evaluate the TTF of technology by assessing eight TTF components (Table 4.3) to predict the performance and effectiveness of a specific technology. This process allows highlighting the problem areas more thoroughly, and it informs the management of potential corrective action (Goodhue, 1995; Goodhue & Thompson, 1995).

Goodhue and Thompson (1995) expand further on the task-technology measures organized around the eight components presented in Table 4.3. Responding to these measures will allow pinpointing the degree of TTF of a specific technology used for task accomplishment.

5.3 Embracing adaptive coping mechanisms

Employees may also minimise possible negative outcomes by reducing their maladaptive coping strategies and adopting coping strategies that focus on proactive problem-solving instead. For example, employees can focus on learning how to use the new technology, asking colleagues for help, and searching for instructions that are specific to their abilities and assigned tasks.

Table 4.3 TTF measurement components

Focus	Components of measuring TTF
Meeting task needs for using data in decision-making	Data quality Data locability Authorisation Data compatibility Usability and training
Meeting daily operational needs	Timeliness in meeting (scheduled) operations Systems reliability
Responding to shifting business needs	Systems relation with users

Organizations and managers may assist employees in embracing adaptive coping mechanisms by introducing initiatives that focus on explaining technostress, techno-stressors, and relevant adaptive coping strategies. Moreover, organizations and managers should explain how and in which situations to adopt these strategies. Managers can teach adoption of these strategies through initiatives, such as employee training, job redesign, reward mechanisms, and interventions focusing on reducing techno-stressors (Gaudioso et al., 2017). Furthermore, organizations may analyse what type of coping strategies could be most optimal for different situations and technologies and seek to train employees to adopt these strategies through incentive systems or training programs.

6 Further reading

- Ayyagari, R. (2012). Impact of information overload and task-technology fit on technostress. *SAIS 2012 Proceedings*. Retrieved from <https://aisel.aisnet.org/sais2012/4>
- Tarafdar, M., Pullins, E. B., & Ragu-Nathan, T. S. (2015). Technostress: Negative effect on performance and possible mitigations. *Information Systems Journal*, 25(2), 103–132. <https://doi.org/10.1111/isj.12042>
- Tarafdar, M., Tu, Q., & Ragu-Nathan, T. S. (2010). Impact of technostress on end-user satisfaction and performance. *Journal of Management Information Systems*, 27(3), 303–334. <https://doi.org/10.2753/MIS0742-1222270311>
- Zhao, X., Xia, Q., & Huang, W. (2020). Impact of technostress on productivity from the theoretical perspective of appraisal and coping processes. *Information & Management*, 103265. <https://doi.org/10.1016/j.im.2020.103265>

7 References

- Arnold, J., Randall, R., Randall, F., Silvester, J., Robertson, I., Harris, D., . . . & Axtell, C. (2016). *Work psychology: Understanding human behaviour in the workplace* (6th ed.). Pearson Education.
- Ayyagari, R., Grover, V., & Purvis, R. (2011). Technostress: Technological antecedents and implications. *Management Information Systems Quarterly*, 35(4), 831–858. <https://doi.org/10.2307/41409963>
- Bere, A. (2018). Applying an extended task-technology fit for establishing determinants of mobile learning: An instant messaging initiative. *Journal of Information Systems Education*, 29(4), 239–252.
- Bergman, B., Hellström, A., Lifvergren, S., & Gustavsson, S. M. (2015). Rejoinder. *Quality Engineering*, 27(1), 41–43. <https://doi.org/10.1080/08982112.2015.968045>
- Brivio, E., Gaudioso, F., Vergine, I., Mirizzi, C. R., Reina, C., Stellari, A., & Galimberti, C. (2018). Preventing technostress through positive technology. *Frontiers in Psychology*, 9. <https://doi.org/10.3389/fpsyg.2018.02569>
- Brod, C. (1984). *Technostress: The human cost of the computer revolution*. Reading, MA: Addison-Wesley.

- Brough, P., Drummond, S., & Biggs, A. (2018). Job support, coping, and control: Assessment of simultaneous impacts within the occupational stress process. *Journal of Occupational Health Psychology*, 23(2), 188–197. <https://doi.org/10.1037/ocp0000074>
- Cameron, A. F., & Webster, J. (2005). Unintended consequences of emerging communication technologies: Instant messaging in the workplace. *Computers in Human Behavior*, 21(1), 85–103. <https://doi.org/10.1016/j.chb.2003.12.001>
- Cascio, W. F., & Montealegre, R. (2016). How technology is changing work and organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, 3(1), 349–375. <https://doi.org/10.1146/annurev-orgpsych-041015-062352>
- Chen, G., Zhao, Y., Zhang, N., Wang, F., & Guo, X. (2015). Task-technology fit in workplaces: Theoretical framework and empirical analysis in the context of mobile government. *International Journal of Mobile Communications*, 13(5), 455. <https://doi.org/10.1504/IJMC.2015.070960>
- Cirella, S., Guerri, M., & Shani, A. B. (Rami). (2012). A process model of collaborative management research: The study of collective creativity in the luxury industry. *Systemic Practice and Action Research*, 25(3), 281–300. <https://doi.org/10.1007/s11213-011-9220-x>
- Coghlan, D. (2001). Insider action research projects: Implications for practising managers. *Management Learning*, 32(1), 49–60. <https://doi.org/10.1177/1350507601321004>
- Coghlan, D. (2003). Practitioner research for organizational knowledge: Mechanistic- and organic-oriented approaches to insider action research. *Management Learning*, 34(4), 451–463. <https://doi.org/10.1177/1350507603039068>
- Compeau, D. R. (1995). Computer self-efficacy: Development of a measure and initial test. *Management Information Systems Quarterly*, 19(2), 189–211. <https://doi.org/10.2307/249688>
- Cooper, C., Dewe, P., & O'Driscoll, M. (2001). *Organizational stress: A review and critique of theory, research, and applications*. Thousand Oaks, CA: SAGE Publications, Inc. <https://doi.org/10.4135/9781452231235>
- Coughlan, P., Draaijer, D., Godsell, J., & Boer, H. (2016). Operations and supply chain management: The role of academics and practitioners in the development of research and practice. *International Journal of Operations & Production Management*, 36(12), 1673–1695. <https://doi.org/10.1108/IJOPM-11-2015-0721>
- Dickson-Swift, V., Fox, C., Marshall, K., Welch, N., & Willis, J. (2014). What really improves employee health and wellbeing: Findings from regional Australian workplaces. *International Journal of Workplace Health Management*, 7(3), 138–155. <https://doi.org/10.1108/IJWHM-10-2012-0026>
- Dishaw, M. T. (1999). Extending the technology acceptance model with task-technology fit constructs. *Information and Management*, 36(1), 9–21. [https://doi.org/10.1016/S0378-7206\(98\)00101-3](https://doi.org/10.1016/S0378-7206(98)00101-3)
- Dollard, M. F., Le Blanc, P. M., & Cotton, S. J. (2008). Participatory action research as work stress intervention. In *The individual in the changing working life* (pp. 353–379). Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511490064.017>
- Espedido, A., Searle, B. J., & Griffin, B. (2020). Peers, proactivity, and problem-solving: A multilevel study of team impacts on stress appraisals of problem-solving demands. *Work & Stress*, 34(3), 219–237. <https://doi.org/10.1080/02678373.2019.1579767>
- Folkman, S. (2013). Stress: Appraisal and coping. In M. D. Gellman & J. R. Turner (Eds.), *Encyclopedia of behavioral medicine* (pp. 1913–1915). New York: Springer. https://doi.org/10.1007/978-1-4419-1005-9_215
- Fuglseth, A. M., & Sørensen, Ø. (2014). The effects of technostress within the context of employee use of ICT. *Computers in Human Behavior*, 40, 161–170. <https://doi.org/10.1016/j.chb.2014.07.040>
- Fuller, R. M. (2009). Does fit matter? The impact of task-technology fit and appropriation on team performance in repeated tasks. *Information Systems Research*, 20(1), 2–17. <https://doi.org/10.1287/isre.1070.0167>
- Gage, M. (1992). The appraisal model of coping: An assessment and intervention model for occupational therapy. *American Journal of Occupational Therapy*, 46(4), 353–362. <https://doi.org/10.5014/ajot.46.4.353>
- Gaudioso, F., Turel, O., & Galimberti, C. (2017). The mediating roles of strain facets and coping strategies in translating techno-stressors into adverse job outcomes. *Computers in Human Behavior*, 69, 189–196. <https://doi.org/10.1016/j.chb.2016.12.041>
- Gebauer, J., Shaw, M. J., & Gribbins, M. L. (2010). Task-technology fit for mobile information systems. *Journal of Information Technology*, 25(3), 259–272. <https://doi.org/10.1057/jit.2010.10>
- Goodhue, D. L. (1995). Understanding user evaluations of information systems. *Management Science*, 41(12), 1827. <https://doi.org/10.1287/mnsc.41.12.1827>
- Goodhue, D. L., Klein, B. D., & March, S. T. (2000). User evaluations of IS as surrogates for objective performance. *Information & Management*, 38(2), 87–101. [https://doi.org/10.1016/S0378-7206\(00\)00057-4](https://doi.org/10.1016/S0378-7206(00)00057-4)

- Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *Management Information Systems Quarterly*. <https://doi.org/10.2307/249689>
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review: *Review of General Psychology*. <https://doi.org/10.1037/1089-2680.2.3.271>
- Hoeven, C. L. ter., & Zoonen, W. van. (2015). Flexible work designs and employee well-being: Examining the effects of resources and demands. *New Technology, Work and Employment*, 30(3), 237–255. <https://doi.org/10.1111/ntwe.12052>
- Hung, Y.-T. C., Duyen, N. T. T., Kong, W.-C., & Chua, A.-L. (2008). Reexamining media capacity theories using workplace instant messaging. *IEEE Transactions on Professional Communication*, 51(4), 352–368. <https://doi.org/10.1109/TPC.2008.2007861>
- Ipsen, C., & Jensen, P. L. (2012). Organizational options for preventing work-related stress in knowledge work. *International Journal of Industrial Ergonomics*, 42(4), 325–334. <https://doi.org/10.1016/j.ergon.2012.02.006>
- Ipsen, C., Karanika-Murray, M., & Nardelli, G. (2020). Addressing mental health and organisational performance in tandem: A challenge and an opportunity for bringing together what belongs together. *Work and Stress*, 34(1), 1–4. <https://doi.org/10.1080/02678373.2020.1719555>
- Kuo, R.-Z., & Lee, G.-G. (2011). Knowledge management system adoption: Exploring the effects of empowering leadership, task-technology fit and compatibility. *Behaviour & Information Technology*, 30(1), 113–129. <https://doi.org/10.1080/0144929X.2010.516018>
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York: McGraw-Hill.
- Lazarus, R. S. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review of Psychology*, 44(1), 1–22. <https://doi.org/10.1146/annurev.ps.44.020193.000245>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer Publishing Company.
- Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, 1(3), 141–169. <https://doi.org/10.1002/per.2410010304>
- Lee, C.-C., Cheng, H. K., & Cheng, H.-H. (2007). An empirical study of mobile commerce in insurance industry: Task-technology fit and individual differences. *Decision Support Systems*, 43(1), 95–110. <https://doi.org/10.1016/j.dss.2005.05.008>
- Li, F., Chen, T., & Lai, X. (2018). How does a reward for creativity program benefit or frustrate employee creative performance? The perspective of transactional model of stress and coping. *Group & Organization Management*, 43(1), 138–175. <https://doi.org/10.1177/1059601116688612>
- Mahapatra, M., & Pillai, R. (2018). *Technostress in organizations: A review of literature*. European Conference on Information Systems (ECIS 2018) [Research Papers]. Portsmouth, UK. Retrieved from https://aisel.aisnet.org/ecis2018_rp/99
- Mayes, B. T., & Ganster, D. C. (1988). Exit and voice: A test of hypotheses based on fight/flight responses to job stress. *Journal of Organizational Behavior*, 9(3), 199–216. <https://doi.org/10.1002/job.4030090302>
- McGill, T. J., & Klobas, J. E. (2009). A task: Technology fit view of learning management system impact. *Computers & Education*, 52(2), 496–508. <https://doi.org/10.1016/j.compedu.2008.10.002>
- Pagani, M. (2006). Determinants of adoption of high speed data services in the business market: Evidence for a combined technology acceptance model with task technology fit model. *Information and Management (Amsterdam)*, 43(7), 847–860. <https://doi.org/10.1016/j.im.2006.08.003>
- Rafferty, A. E., & Griffin, M. A. (2006). Perceptions of organizational change: A stress and coping perspective. *Journal of Applied Psychology*, 91(5), 1154–1162. <https://doi.org/10.1037/0021-9010.91.5.1154>
- Roskam, E. (2009). Using participatory action research methodology to improve worker health. In *Unhealthy work: Causes, consequences, cures* (pp. 211–228). New York: Baywood Publishing Co.
- Schnall, P. L., Dobson, M., & Roskam, E. (2009). *Unhealthy work: Causes, consequences, cures*. New York: Baywood Publishing Co.
- Shih, Y.-Y., & Chen, C.-Y. (2013). The study of behavioral intention for mobile commerce: Via integrated model of TAM and TTF. *Quality & Quantity*, 47(2), 1009–1020. <https://doi.org/10.1007/s11135-011-9579-x>
- Spies, R., Grobbelaar, S., & Botha, A. (2020). A scoping review of the application of the task-technology fit theory. In M. Hattingh, M. Matthee, H. Smuts, I. Pappas, Y. K. Dwivedi, & M. Mäntymäki (Eds.), *Responsible design, implementation and use of information and communication technology* (pp. 397–408). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-44999-5_33
- Srivastava, S. C., Chandra, S., & Shirish, A. (2015). Technostress creators and job outcomes: Theorising the moderating influence of personality traits. *Information Systems Journal*, 25(4), 355–401. <https://doi.org/10.1111/isj.12067>

- Strong, D. M., Dishaw, M. T., & Bandy, D. B. (2006). Extending task technology fit with computer self-efficacy. *ACM SIGMIS Database: The DATABASE for Advances in Information Systems*, 37(2–3), 96–107. <https://doi.org/10.1145/1161345.1161358>
- Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007). The impact of technostress on role stress and productivity. *Journal of Management Information Systems*, 24(1), 301–328. <https://doi.org/10.2753/MIS0742-1222240109>
- Troy, A. S. (2013). A person-by-situation approach to emotion regulation: Cognitive reappraisal can either help or hurt, depending on the context. *Psychological Science*, 24(12), 2505–2514. <https://doi.org/10.1177/0956797613496434>
- Van de Ven, A. H. (2007). *Engaged scholarship: A guide for organizational and social research*. Oxford: Oxford University Press.
- Vanduhe, V. Z., Nat, M., & Hasan, H. F. (2020). Continuance intentions to use gamification for training in higher education: Integrating the technology acceptance model (TAM), social motivation, and task technology fit (TTF). *IEEE Access*, 8, 21473–21484. <https://doi.org/10.1109/ACCESS.2020.2966179>
- Vuori, V., Helander, N., & Okkonen, J. (2019). Digitalization in knowledge work: The dream of enhanced performance. *Cognition, Technology & Work*, 21(2), 237–252. <https://doi.org/10.1007/s10111-018-0501-3>
- Zigurs, I., & Buckland, B. K. (1998). A theory of task/technology fit and group support systems effectiveness. *MIS Quarterly*, 22(3), 313–334. <https://doi.org/10.2307/249668>
- Zigurs, I., & Khazanchi, D. (2008). From profiles to patterns: A new view of task-technology fit. *Information Systems Management*, 25(1), 8–13. <https://doi.org/10.1080/10580530701777107>