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"I NEED HELP – NOW!": THE ROLE OF TECHNICAL SUPPORT IN THE PROCESS OF IS USE COPING

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Research Paper

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Abstract

IS research has identified technical support as an important organizational measure that increases user satisfaction and may reduce technostress. Yet, the effectiveness of such offers is dependent on whether and how users utilize them. Research has shown that there are manifold different coping sequences that users take after discrepant IT events. However, insights on the intersection between technical support and the user’s own coping sequences are missing so far. To address this gap, we conduct a qualitative interview study with 31 users of technical support in a German service organization. We develop a process model that explains the coping sequences taken by users after experiencing a discrepant IT event and identify factors that influence how and why they contact technical support. Thus, we provide insights on the effective utilization of technical support and derive measures on how to best support employees in their coping efforts.

Keywords: Technical support, IS use, coping, discrepant IT event.

1 Introduction

With information technology (IT) becoming an integral part of our daily lives, we are often confronted with new questions and challenges arising, such as the accelerated pace at which employees are forced to adopt new IT, or issues with malfunctioning technology that lead to an increasing number of negative psychological and physiological consequences like distress (Ragu-Nathan et al., 2008; Ayyagari et al., 2011). This comes at a time when designing a human-centred digitalization has become a major challenge for businesses and society. In the greater context, a healthy usage of IT is indispensable for the resilience of organizations and the health of their employees. Consequently, scholarly investigation on the subject represents a longstanding and growing stream of information systems (IS) research (e.g., Tarafdar et al., 2015). A major individual consequence of IS use is stress – often referred to as technostress (Ragu-Nathan et al., 2008). A large body of research focuses on various adverse consequences of organizational technology use and the mitigation of its harmful impact for individuals and organizations (Tarafdar et al., 2011). To this date, many IS research contributions point to technical support provision as a major way to mitigate technostress (Ragu-Nathan et al., 2008) or facilitate use (Venkatesh et al., 2003).

Research on how users cope with discrepant IT events provides a situational view on the phenomenon in question. Confronted with discrepant IT events, employees may feel negative emotions, such as

frustration or anger (Ortiz de Guinea and Webster, 2013). To deal with discrepant IT events, employees can try to change the situation through coping strategies. The concept of coping refers to an individual's changing cognitive and behavioural attempts to manage demanding situations; coping strategies are specific ways of actualizing such attempts in practice (Lazarus and Folkman, 1984). These can involve problem-focused strategies that aim to change the situation or emotion-focused strategies that address the psychological state of the individual (e.g., Weinert et al., 2020). Coping sequences are dynamic in nature and can include several of such coping strategies (e.g., Salo et al., 2020). While many studies have investigated coping with discrepant IT events (e.g., Beaudry and Pinsonneault, 2010; Bhattacherjee et al., 2017; Liang and Xue, 2009) only a few have considered the sequence in which different coping strategies are employed (Salo et al., 2020).

One aspect of a user's coping sequence can be contacting technical support to receive instrumental support (Weinert et al., 2020). For that, users need to actively contact the technical support and make deliberate use of it (Li and Wang, 2021). Technical support provision bears the potential to mitigate technostress (Ragu-Nathan et al., 2008) and facilitate IS use (Venkatesh et al., 2003). Yet, in some instances communication with technical support may even be perceived as frustrating in some instances which lowers its potential positive impact (Califf et al., 2020). To fully exploit the potential, however, two steps are still necessary: First, understanding how and when users contact the technical support as part of their own coping sequence would allow researchers and practitioners to gain insights into effective designs and utilizations of technical support and inform them on how to best support employees in their coping efforts. For that, it is necessary to view technical support as part of the users' individual coping sequences. Second, the understanding of how the discrepant IT event itself as well as the user's coping sequences influence the components of user appraisal at the time of contacting the technical support would allow to gain a holistic picture on employees coping sequences after a discrepant IT event. Thus, we propose the following two research questions:

1) Which coping sequences lead to users contacting technical support and why do users choose them?
2) What components of user appraisal are associated with these sequences and thus relevant when contacting technical support?

To answer our research questions, we conduct an exploratory qualitative study based on interviews with users of a technical support. We collected the data at the latest 24 hours after the users contacted technical support to reduce recall bias. Based on the analysis of our interview data, we identified the users' individual technostress coping sequences, and relevant components of user appraisal and further derive measures on how to enhance technical support provision with the goal of reducing technostress.

Our study provides detailed information on individual coping sequences that lead to users contacting technical support. We show that there are multiple paths through which technical support is contacted and that users that take different paths may require different support levels to effectively mitigate technostress. We show that timeliness, emotional load and ambiguity are important components of user appraisal. For practice, these insights help design and shape technical support provision by showing different paths through which users contact technical support and different expectations associated with them. We provide concrete advice on how technical support may improve their service offerings to reduce technostress along the users' coping routes. Individuals, on the other hand, can learn from our investigation about how they can best incorporate technical support into their own coping sequences.

2 Theoretical Background

2.1 Coping in IS Use Research

IS use is "a user's employment of a system to perform a task" (Burton-Jones and Gallivan, 2007, p. 659). In the organizational context, IS may be used for many different purposes, including workflow-management-systems to support processes and tasks or communication and collaboration systems to enable the exchange of knowledge and information between employees. There are undoubtably many

advantages of IS use, such as increased innovativeness (Maier et al., 2021) or individual performance and productivity (Burton-Jones and Straub, 2006). Yet, IS use has also been recognized as the root for negative consequences associated with technologies, such as stress (Ayyagari et al., 2011). The concept of technostress captures this dark side of IS use as "stress that users experience as a result of their use of IS in the organizational context" (Tarafdar et al., 2015, p. 103).

There are many facets of IS use that have been associated with such negative consequences. For example, technology characteristics like (un-)reliability and complexity may lead to IT-induced stress (Ayyagari et al., 2011). This view on technostress treats technostress-creators as chronic issues associated with the use of IS. Organizations may reduce adverse consequences of technostress through the provision of inhibitors, such as technical support, user involvement, or literacy facilitation (Ragu-Nathan et al., 2008). A separate research stream has investigated negative circumstance of IS use from a situational point of view. They view discrepant IT events as a source for negative consequences – unexpected events that entail problems or difficulties, for example when a technology does not behave according to plan while working on a work-related task (Ortiz de Guinea, 2016). This is congruent with unreliability, which includes "system malfunctions and unexpected system behavior" (Fischer et al., 2019) and is thus often a cause for discrepant IT events. For example, system breakdowns have been associated with increased cortisol levels which is a biological marker for acute stress (Riedl, 2012).

Using coping theory, many research contributions have investigated how users deal with discrepant IT events (e.g., Salo et al., 2020). Coping includes "cognitive and behavioral efforts to manage (master, reduce, or tolerate) a troubled person-environment relationship" (Lazarus and Folkman, 1984, p. 152). Users can engage in different coping behaviors that aim at different aspects of the stress process. For example, users may try to reduce their exposure to stressful situations, try to improve their toleration of stressful situations, or mitigate unavoidable consequences of stressful situations (Salo et al., 2017). Numerous research contributions have identified and categorized coping strategies (specific ways of coping in practice) that users can employ (Salo et al., 2020). Some of those strategies are aimed at the problems associated with discrepant IT events, such as fixing the IT or adjusting one's IT use practices. Other strategies aim to reduce emotional load, such as airing out emotions (venting) or downplaying the consequences of a problem (Salo et al., 2020).

Further, IS contributions have shown that individual perceptions (appraisals) of a situation determine the utilization of strategies by the users. Such appraisal factors include the perception of control over a situation (Beaudry and Pinsonneault, 2010), the relevance of the situation or the user's emotional state (Salo et al., 2020). If users perceive the situation to be controllable, they tend to employ problem-focused strategies (Salo et al., 2020) while users with low control may try to distance themselves from the situation (Pirkkalainen et al., 2019). Similarly, the relationship between appraisal and coping has been studied in connection with IT security related incidents (e.g., Liang and Xue, 2009; Burns et al., 2017)

Recently, contributions regarding coping sequences have added to our understanding of IS use coping. Coping sequences are "a combination of using two or more consecutive coping strategies" (Salo et al., 2020, p. 1145). Ortiz de Guinea (2016) developed a process model that accounts for temporal relationships within coping sequences. Their study demonstrates that users employ problem-focused strategies to assess whether a situation is changeable and may adopt disengagement strategies over time as they lose that perception. Salo et al. (2020) show that emotion-focused and problem-focused strategies may intertwine and demonstrate how users navigate between them. They identify adaptive sequences that lead to closure (solving the problem) and maladaptive sequences that do not. Depending on the circumstances, these sequences can include multiple coping strategies and may be prolonged.

All of studies have added to the substantial corpus of knowledge regarding IS use coping and have shed light on the "messy ways" of IS use coping (Salo et al., 2020, p. 1161). To the best of our knowledge, no study has investigated the intersection between the users' coping sequences and their utilization of technical support. This is important because organizations introduce technical support in the hopes of assisting in solving IS use-related problems (Ragu-Nathan et al., 2008). Thus, there is a dependency

between the users' own coping sequences and the technical support provided by the organization. Shedding light on this may help organizations tailor their support to the users' needs.

2.2 Technical Support in the Context of IS Use

Organizations can provide support to individuals to deal with IS use-related problems through the help of IT experts. Technical support provision "describes activities related to end-user support that reduce the effects of technostress by solving users' ICT problems" (Ragu-Nathan et al., 2008, p. 427). Seminal work on IS use has identified technical support provision as a facilitating conditions, and thus an antecedent, of IS use (e.g., Venkatesh et al., 2003). Research has also shown that the availability of technical support can reduce negative consequences, such as work stress and technostress (Ragu-Nathan et al. 2008). Since then, there have been numerous research contributions on the subject.

For example, various positive relationships between organizational support and other variables such as job satisfaction, organizational commitment (Ragu-Nathan et al., 2008), end-user satisfaction (Qiang et al., 2008; Fuglseth and Sørebø, 2014) and technology-enabled innovation (Tarafdar et al., 2015). In an experimental setting, Weinert et al. (2020) show that instrumental support (which could be provided by a competent help desk) reduces psychological exhaustion and increases end-user performance. In a study of coping sequences, Ortiz de Guinea (2016) investigate help-seeking as part of engagement coping (strategies aimed at solving the problem). Yet in their model they do not explicitly differentiate it from other coping strategies within this category. Despite all the identified positive aspects of technical support provision, the actual effectiveness of such an offering is subject to the willingness of users to make use of it (Li and Wang, 2021). Therefore, the technical support needs to be tailored to the end user's needs to be effective. For example, Califf et al. (2020) found that hospital staff perceive communication with the technical support as frustrating and as taking away time from patient care which lowers the potential positive impact according to the study.

While several research contributions exist that point to the usefulness of technical support and its various positive impacts on end users, there is surprisingly little research on the actual interaction between help desk and users. Research on IS use coping has shown that most users engage in problem-solving activities themselves before seeking instrumental support by others (Salo et al., 2020). Therefore, the coping sequences of end users intertwine with the provision of technical support, and it is to be expected that there are dependencies between the two. Insights on this intersection are important to design help desks that end users accept and make use of. This paper addresses this important gap by assessing how users navigate through the coping process and make use of technical support.

3 Method

To understand which coping sequences users take before contacting technical support we conduct a qualitative study with an interpretive approach (Klein and Myers, 1999; Lee, 1991; Salo et al., 2018). Through interviews, we gain deep insights into how users perceive a discrepant IT event and the subsequent coping sequence and investigate what components of user appraisal influence individuals in their actions. To identify categories, relationships, and patterns, we analyse the data by adopting content analysis following Berg (2004) and Salo et al. (2020).

3.1 Data Collection

We conducted semi-structured interviews with users who contacted technical support (Lune and Berg, 2017; Myers and Newman, 2007). We chose this exploratory method to account for the complexity of individual coping sequences and to better understand the users' perspectives on coping strategies taken after a discrepant IT event. The study was conducted in a German service organisation with approximately 220 employees that provides knowledge-intensive services in an educational and consulting context to individual, corporate, and public customers. The organisation consists of departments that provide external service offerings and internal shared services. The organisation

operates an in-house technical support that employees can contact via e-mail (ticket system) or in urgent situations via telephone.

The interview participants were selected according to the following criteria: (1) the user contacted technical support, (2) the reason was an IT incident according to Salo et al. (2020) (rather than a change request), and (3) an interview was feasible within one working day after contacting technical support. The latter was important to reduce potential recall bias which is a major limitation of such studies (Folkman and Moskowitz, 2004). To account for that bias, many previous studies on coping sequences have used critical incident techniques (Salo et al., 2020; Ortiz de Guinea, 2016; Salo et al., 2018) or laboratory settings (Ortiz de Guinea and Webster, 2013; Ortiz de Guinea, 2016) rather than everyday real-world settings. During the two-month data collection phase (May to July 2021), technical support was contacted 278 times of which 11.15% (n=31) met all three criteria. Many of the other technical support tickets were related to licence management or change requests and therefore failed to meet criterion two. A follow-up interview was conducted with 14 interviewees since the coping process had not yet been finally completed at the time of the first interview and there was therefore no problem solution yet. See Table 1 for further information on the conducted interviews.

ID	Age & gender	Description of discrepant IT event	ID	Age & gender	Description of discrepant IT event
1	M | 28	MS Word Add-In does not work	*17*	W | 27	File sharing does not work
2	M | 21	VPN connection does not work	*18*	M | 28	Connection to server crashes
3	M | 31	Time booking not possible	*19*	M | 27	Software does not allow sharing
4	W | 28	File sharing does not work	*20*	M | 28	VPN connection does not work
5	W | 31	Mouse usage problems	*21*	W | 25	Access problems to certain files
6	W | 26	System does not accept password	*22*	W | 27	Hardware problem with notebook
7	M | 26	Software does not display all data	*23*	M | 32	Hardware problem with notebook
8	W | 23	Urgent access to software needed	*24*	W | 27	No access to certain software
9	M | 35	Windows requires license key	*25*	W | 63	Problems with sending emails
10	W | 30	Download does not work	*26*	W | 24	Forgotten password
11	M | 28	VPN connection does not work	*27*	W | 28	Missing MS Outlook access rights
12	W | 29	VPN connection does not work	*28*	W | 36	Message cannot be opened / read
13	W | 21	Certain access rights are missing	*29*	M | 25	No access to certain software
14	M | 21	Problem with editing an MS SharePoint page	*30*	M | 30	Problems with MS Outlook
15	M | 28	Defect of smart card	*31*	W | 27	File sharing does not work
16	W | 29	Hardware problem with notebook & audio problems			

Table 1. Overview of interview partners and discrepant IT events

Interviewees were informed that participation was voluntary, and that data would be treated confidentially. The research purpose was outlined and permission to record the interview was obtained. The interview questions were structured around four key categories. First, the general context of the discrepant IT event was asked about to provide context to our data. Second, the dimensions of appraisal of the discrepant IT event identified by Salo et al. (2020) were discussed (personal relevance, momentary emotional load, and confidence for overcoming the IT-Incident). Third, interviewees were asked to describe the coping sequence they took to overcome the situation including the impact of each coping strategy on themselves and the situation. That helped us shed light on potential reappraisals of the situation and the emotional state of the participants. Fourth, open-ended questions were asked regarding possible improvements to the technical support provision that would have positively affected the coping sequence. We followed the guidelines for interviewing by Myers and Newman (2007). The interviews lasted between 10 to 20 minutes and were mostly conducted via video calls. Transcripts were created with the help of the audio recordings.

3.2 Data Analysis

To answer our research question, we adopted content analysis following Berg (2004) and Salo et al. (2020). This approach is suitable for gaining an in-depth view on individual coping sequences and allowed us to establish categories, explore the underlying relationships, and identify patterns. The unit of analysis was the different coping strategies taken by the user after a discrepant IT event.

First, we generated an overview of the individual coping sequences taken and the interviewees' perception of the discrepant IT event. This served as a database for further analysis. For the coding of our qualitative data, a mixed deductive-inductive approach was used: the four overarching categories (discrepant IT event, user appraisal, coping strategies, and technical support) were deductively derived from theory. Second, the subcategories were developed inductively from the data. One of the authors coded the first ten interviews into using the software MaxQDA. In a next step, all three authors jointly discussed, compared, and, if necessary, adapted the emerging coding sub-categories in a workshop. The remaining transcripts were coded according to this coding frame. No further adaptation was made.

As a result, the final coding scheme with the category names, descriptions, sources, and data examples is depicted for illustration (see Table 2). Codes within the sub-categories are omitted for reasons of space.

Category	Description	Reference	Data Example
Situation			
Discrepant IT event	Unexpected IT Event that entails problems or difficulties with the employed IT.	Ortiz de Guinea, 2016	"At first, I was really just totally surprised, because we do the process all the time and it just didn't work like that this time. And then I was slightly panicked".
Coping strategies			
Problem solving	Independent active attempts to address and solve the underlying problem at hand.	Pirkkalainen et al., 2019	"The first thing I tried is that I thought the tab is simply not displayed properly and I just right clicked to adjust the ribbon at the top and select the add-in again".
Information seeking	Utilize manuals, go systematically through the menus, seek information from the internet or from others to try out various possible fixes.	Salo et al., 2018	"I started researching on the internet. I also quickly found a solution, where it then seemed that this is quite simple, which then also did not work".
Workaround	Purposefully seeking alternative methods to avoid the use of a particular IT or asking others to use the IT on their behalf.	Bhattacherjee et al., 2017	"I pulled the whole document into my personal cloud folder to be in control [over access rights] myself and not have to take the detour via the technical support [for the company's cloud]".
Problem avoidance	Users intend to enlarge the discrepancy between their current state and the undesired state (associated with the problem) by passively avoiding it.	Liang and Xue, 2009	"It was probably a bit of wishful thinking that I thought it might disappear into thin air if I just clicked it away long enough. After it came up this morning again […] I thought to myself: 'Good. I need a solution'".
Contact technical support	Actively contacting end-user support to ask for them to solve the user's problem and to reduce the effects of technostress.	Ragu-Nathan et al., 2008	"When I wrote the ticket to the help desk, I honestly checked it off for myself and was satisfied, because I thought to myself: 'Good, now I've found a solution to the problem'".
User appraisal			
Ambiguity	Unpredictable expectations and consequences associated with discrepant IT events as well as	Ayyagari et al., 2011; Ortiz	"Try to solve it yourself helps, of course, in some way – even if you can't solve it. Contacting the help desk with the feeling

	lack of information needed to overcome it.	de Guinea, 2016	that you haven't even tried wouldn't be my attitude".
Timeliness	User's view of the experienced discrepant IT event is based on the immediacy of its impact.	Salo et al., 2020	"When the problem popped up, I was under time pressure and just thought to myself: Okay, we have to set it up as quickly as possible, because the supervisors are reading about it 24 hours later".
Emotional load	User's perceived temporary state of feeling intense emotions triggered by the discrepant IT event.	Salo et al., 2020	"It was actually nothing critical yesterday, but somehow it then got totally annoyed and upset and then I really wanted to solve it yesterday".

Table 2. Coding scheme: categories, description, data example.

Based on the aggregated data, the authors jointly developed a process model for individual coping sequences. For this, an iterative approach was used where close attention was paid to identify emerging patterns regarding individual coping sequences. The authors constantly compared categories, codes, individual coping strategies and sequences with the emerging process model. The model was iteratively refined based on emerging data.

4 Results

As a result of our data analysis, we derived the main coping measures and coping sequences taken by users after experiencing a discrepant IT event and before contacting the technical support. To fully understand the individual's coping sequences and the factors influencing their decisions (assessments), we present a process model (see Figure 1).

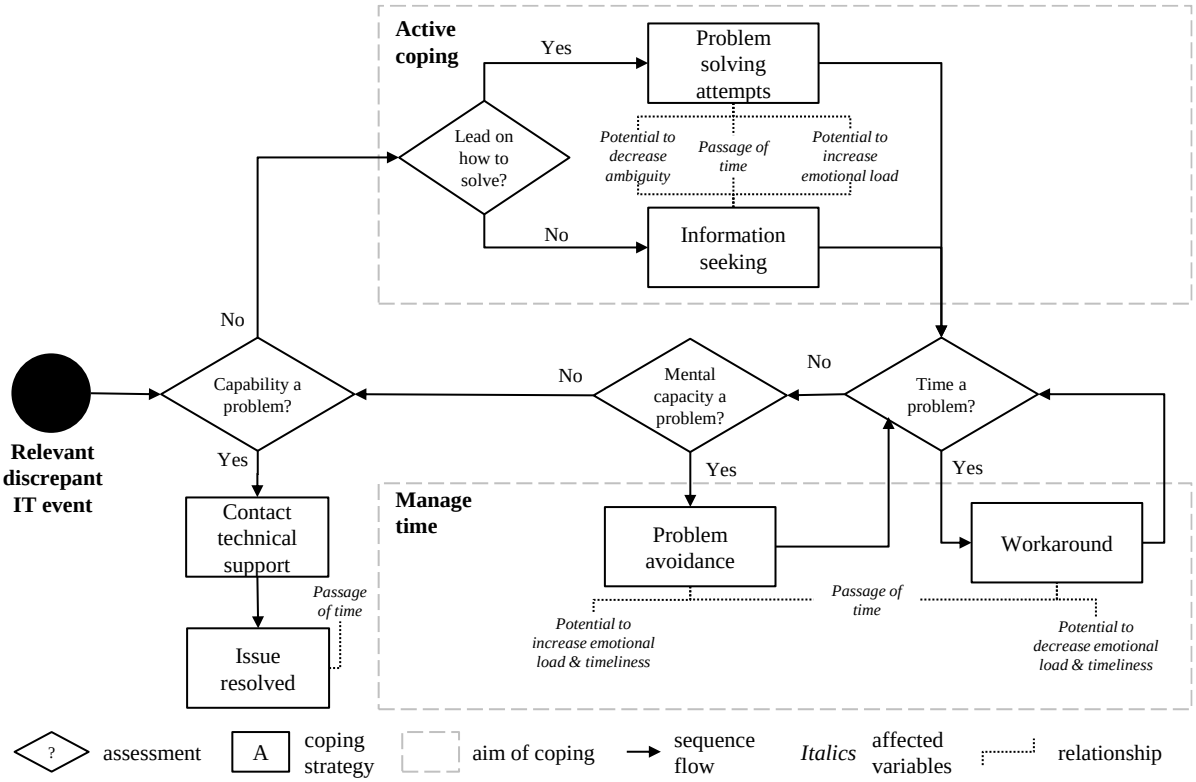

Figure 1. Process model for contacting the technical support after a discrepant IT event

4.1 A Process Model for Contacting Technical Support

Based on our interview data, we created a process model that explains how users navigate discrepant IT events that lead to the contacting of technical support (i.e., they could not be solved by the individuals themselves). It shows various decisions that users make and what coping strategies they take (summarized in Figure 1). The process model uses terminology from BPMN (Rosing et al., 2015). For the sake of model parsimony, some graphical representations of paths and relationships are simplified. Stemming from the insights of our interviews, we identify multiple possible paths that users take before contacting technical support.

The model considers those cases of a discrepant IT event where technical support was contacted. From this we conclude that the user has already appraised the problem as relevant (primary appraisal), otherwise the problem would not have been pursued further and the user would not have contacted technical support. For secondary appraisal, the users assess the situation and choose specific coping strategies. On the basis of the interviews conducted, we find that the first assessment of the situation regards the potential to self-solve the problem considering the user's capabilities necessary for addressing the concrete IT event. If a user feels capable of self-solving the problem, active coping attempts to address the underlying problem are made. This is by far the most frequent path taken after a discrepant IT event.

One of the interviewees described feeling capable of self-solving the problem in the following:

> *"At first, of course, I had the feeling [that I could solve the problem], because I thought maybe I had inserted the smartcard incorrectly or something else was wrong with the VPN client. Yes, at first, I always have the feeling that I can handle it. And it would also be the wrong approach to contact the technical support without even [trying to] solve it."* (Interviewee 15)

Similar, another interviewee states:

> *"I would always try to see if I can solve it myself first and then contact technical support. [...] Once, because I personally don't want to annoy anybody if it's something I can solve faster myself. Then it is also simply less effort for me as well as for the technical support – the process takes time: submitting the ticket, waiting, communication and so on..."* (Interviewee 5)

Yet, if the user feels that the problem is not self-solvable, they directly contact technical support. This path is taken less frequently for reasons outlined in the examples above. The users that do so either know the problem and therefore are certain that they have to contact technical support for it to be solved (low ambiguity) or they have very low technical knowledge and lack self-confidence to address the problem on their own.

Users that assess the problem to be self-solvable and therefore feel confident to overcome the problem themselves engage in active coping strategies. There are two different options that can follow: 1) the user either has an initial, concrete lead on how to solve the problem and tests whether it is successful. A typical attempt for problem solving is e.g., to re-boot a device. Or 2) the user feels confident to overcome the problem but does not know their next step in doing so. Thus, they may seek further information e.g., by asking colleagues for help or by researching online. These coping strategies can be performed multiple times in a row because users may have more than one lead on how to solve the problem or the search for information results in a new lead that is followed by additional problem-solving attempts. For example, one user reported:

> *"I usually try to somehow solve the problems by myself for a certain period until I realize at some point: all right, I can't solve the problem in the short term and I'm sure that if I now ask someone who probably knows about it, then the problem is solved significantly faster."* (Interviewee 30)

Engaging in this loop of active coping strategies aimed at self-solving the problem has the potential to decrease the perceived ambiguity of the situation as the user gains more insights into what is needed to

overcome the problem. Additionally, it has the potential to increase the emotional load as the user is confronted with a series of failed attempts to solve the problem. Interviewee 2 stated:

> *"[After that] I was searching for new ideas on what I can do next. Among other things, I simply tested the internet connection. Unfortunately, that didn't help either. Well, on the one hand it did, because then I knew: Okay, that's not the problem. So, a little bit of enlightenment has already been achieved."* (Interviewee 2)

Only after initial attempts to self-solve the problem does the user face the question of timeliness, which then decisively influences the further procedure in the coping process. This may be because an initial successful active coping attempt would be the fastest way to self-solve the problem, regardless of the timeliness. After their initial active coping attempts, several users report that they engaged in coping strategies aimed at managing time. In a situation that the user perceives as timely, a user may implement a workaround that allows to temporary avoid the particular problem associated with the discrepant IT event, e.g., by switching devices or accounts. Such workarounds bear the potential to provide the user with additional time in an otherwise time-critical situation (decrease timeliness). Interviewee 23 described a workaround as follows:

> *"The fact that I had the [spare] notebook [as a workaround] was first of all a big stress relieve. Because I knew, I now have a crutch to at least get through the day. […] contacting the technical support was second big part […] because I knew: Okay, and also now in the medium and long term it's going to get fixed because the ticket goes to [the people from the technical support] and they will take care of it."* (Interviewee 23)

In a situation perceived as not timely, the user may completely avoid or ignore the problem because it does not have any priority. This depends on the user's mental capacity. If the user feels mentally able to pursue the problem further, the process either continues (with further active coping measures) or the user decides to contact technical support. In most instances captured in our data these issues eventually became timely again after some time. Yet, we acknowledge that this is probably skewed due to our sampling technique that only involves discrepant IT events which eventually resulted in technical support requests. For example, Interviewee 9 described his problem avoidance in the following way:

> *"It was probably a bit of wishful thinking that I thought it might disappear into thin air if I just clicked it away long enough. After it came up this morning again […] I thought to myself: 'Good. I need a solution'. I then wrote to technical support, which was ultimately the last measure I took."* (Interviewee 9)

The loop of active coping strategies ends when the user is no longer confident of having the capability to be able to self-solve the problem. Users reassess the situation as not self-solvable when they have tried multiple ways of active coping and fail to generate additional leads on how to solve the problem. This realization often leads to an increase in frustration and a heightened emotional load. We describe this path as contacting technical support being necessary because the user has no additional lead to self-solve the problem. One of the interviewees described the loop of unsuccessful attempts to solve the problem:

> *"Because I then somehow tried again and tried again and tried again … and with every measure you somehow actually hope that you have found the solution and that it will somehow work out. And that was just not the case. And yes, at some point I thought: Oh, can't this work out somehow?... And with the ticket, it was actually good. That was actually such a relief, because I thought: Good, now I've somehow just handed the problem over to someone else."* (Interviewee 24)

Similarly, another interviewee explained:

> *"Since I still didn't know what the problem was and what measures would help [...] I [myself] didn't see any way out. […] I was actually demotivated at first and then [...] decided to send the ticket."* (Interviewee 5)

Another path to contact technical support is that the user is certain a problem cannot be self-solved (low ambiguity). As described, this may occur immediately in rare instances, yet often the realization comes after unsuccessful problem-solving attempts and information seeking. We describe this path as: Contacting the technical support is necessary, because the user knows that only the technical support can solve the problem. For example, one interviewee stated:

> *"So the error is not up to me. I do not have the necessary access rights and skills to solve the problem [...]. I then immediately contacted the support."* (Interviewee 18)

Lastly, the model focuses especially on problem-focused coping strategies and does not include emotion-based coping strategies. During the interviews, problem-focused coping measures were clearly the focus of the interviewees and were frequently mentioned. In contrast, emotion-based coping measures played no or only a very small role in the coping process for the interviewees.

4.2 Deriving Formal Propositions

As indicated, there are three key components of user appraisal that arise not only from the discrepant IT event itself but are also highly depended on the coping sequences the users take. These components are relevant to the employee when contacting technical support. We proceed to formalize these proposed relationships. Regarding active coping, we propose two relationships. Regarding managing time, we propose two additional relationships.

First, the presented process model depicts manifold coping sequences to contact the technical support. These vary not only in the coping strategies applied, but also in their length. While some interviewees only briefly tried to self-solve the problem before contacting the technical support, others dedicated a lot of time for self-solving attempts during their coping sequence. Thus, some interviewees approached technical support after a long period of unsuccessful coping. At that point, the problem often became timely due to the elapsed time. This is relevant because Lazarus and Folkman (1984) state that timeliness of a stressful situation is a determinant for intensity: "The more imminent an event is, the more intense its appraisal becomes" (p.92). Further, that same prolonged sequence of failed attempts to self-solve the problem led to frustration for many interviewees. As a result, emotional load at the time of contacting the technical support was high. Thus, we propose:

Proposition 1: Prolonged duration of own unsuccessful coping sequences increases timeliness and emotional load for when technical support is contacted.

Second, ambiguity on the source of a problem and how to solve it is often experienced by employees after a discrepant IT event (Ortiz de Guinea and Webster, 2013). We conclude from our interviews that the level of ambiguity is different across the discrepant IT events investigated. While some issues that arise may be associated with previous experiences, others are completely novel. This initial level of novelty of the encountered discrepant IT event determines the ambiguity associated with the event. Yet, the initial state of ambiguity can be affected by gaining a deeper understanding of the problem and its solution which users do when their information seeking is successful. Thus, active coping attempts provide the potential to decrease ambiguity and gain a better understanding of the situation. Therefore, we propose:

Proposition 2: Successful information seeking decreases ambiguity of how the IT incident can be self-solved and whether technical support needs to be contacted.

Third, there are coping strategies within our process model that reduce timeliness. This is when successful workarounds can be established. The use of workarounds has been acknowledged as a coping strategy in previous work on technostress (Bhattacherjee et al., 2017). So far, they often have been associated with a deviant work behaviour aimed at avoiding the intended use of IT systems. Yet, in our study we find workarounds to be deviant responses when the proper use of IT is not available because of a discrepant IT event. In our interviews, such workarounds gave individuals time to fix the actual

problem – often with the assistance of the technical support. Congruent with proposition 1, this reduced timeliness is often associated with a reduced emotional load. Thus, we propose:

Proposition 3: Successful workarounds reduce timeliness of discrepant IT events and thus reduce emotional load for when technical support is contacted.

Lastly, in situations that were perceived as not timely we observed that some users ignored the discrepant IT event for an extended period of time. Several interviewees ignored underlying problems for multiple days or weeks while sometimes adjusting work routines and tasks to avoid the problem. Yet, eventually suppressed tasks and problems became timely again. This perception of timeliness then often led to users contacting technical support without the availability of necessary time to wait for help. Thus, we propose:

Proposition 4: Prolonged problem avoidance may eventually lead to an increase in timeliness when technical support is contacted.

5 Discussion, Contribution and Limitations

In our interview phase, we identified multiple factors that determine what coping decisions are made by the individuals before they contact technical support. The proposed process model provides an overview on the main coping sequences. Accordingly, users can engage in active coping attempts, like problem solving or seeking for information, or they may manage time, through implementing workarounds or avoiding the problem temporarily. As per our research design, all users contacted technical support at some point. Several assessments determine how users navigate between different coping strategies in order to contact technical support. Additionally, we propose three components of user appraisal, timeliness, ambiguity, and emotional load, that are affected by the discrepant IT event itself but may change in the course of the different coping sequences. This has several implications for the design of technical support.

5.1 Theoretical Implications

By proposing a process model for contacting the technical support after a discrepant IT event and examining the three components of user appraisal timeliness, ambiguity, and emotional load in the course of individual coping sequences, this study makes three contributions to IS research:

First, current IS research has provided extensive insights regarding individual coping strategies and sequences after a discrepant IT event. Building up on previous knowledge, this study sheds light on the role of technical support in IS use coping by explaining how and when users contact technical support as part of their coping sequences. We show that users navigate between active coping and managing time. We identify several assessments that users make along the coping process. This understanding allows to broaden the knowledge on individual coping in an organizational context, to understand the role of technical support provision and to shape its effective design. Therewith, we contextualize findings from psychology (e.g., Folkman, 2011) and extend existing IS research (e.g., Salo et al., 2020) that describes how users engage in multiple coping strategies and show that this process is highly individual. With our focus on how users contact technical support as part of their coping sequences, we shed light on the users' interaction with a highly relevant part of organizational facilitating condition and mitigation mechanism for technostress (Venkatesh et al., 2003; Ragu-Nathan et al., 2008). In doing so, we extend prior research on IS use during and after discrepant IT events and the role of technical support.

Second, this study shows that there are three key components of user appraisal relevant to the IS use coping process: timeliness, ambiguity, and emotional load. These components do not only depend on the discrepant IT event itself but are also highly affected by the users coping sequence. We make the relationship between the coping sequences and these three components explicit in our four formal propositions. For instance, the implementation of a successful workaround can decrease timeliness.

Depending on the individual choice of coping strategies, the perceived degree of the three components can differ from user to user. With our findings, we extend previous studies by specifying the role of these three components of user appraisal and their relationships with the coping strategies taken by the user.

Third, studies that investigate individual coping sequences in connection with discrepant IT events usually use the critical incident technique (Salo et al., 2018; Tarafdar et al., 2020; Ortiz de Guinea, 2016). Such studies try to address recall bias, a systematic error caused by differences in the accuracy and completeness of the retrieved recollections (Folkman and Moskowitz, 2004), by focussing on situations that were so critical to users that they remember many details. Yet, one of the disadvantages of the method is that such critical incidents may not be representative of everyday events. Other studies on coping sequences use laboratory settings (Ortiz de Guinea and Webster, 2013; Ortiz de Guinea, 2016) rather than real world data. While data collected in these ways has certainly significantly extended our knowledge of topic and has led to essential contributions cited in the study at hand, real world data may produce additional insights or corroborate existing insights. For this paper, we were able to collect real-world data while reducing recall bias by querying users shortly after discrepant IT events. Therewith, we contribute to current research by 1) providing an additional methodological approach that allows to investigate discrepant IT events, 2) analysing and reporting coping data that captures discrepant IT events of an organization more broadly. While many findings corroborate existing insights, the absence of significant amounts of emotional coping, for example, is one that deviates from other studies.

5.2 Practical Implications

Our study addresses a topic of practical relevance. While most organizations provide technical support to their users, there is currently limited insights on how and when users make use of it during their own efforts to deal with discrepant IT events. This study's findings provide useful insights into the design of a good technical support that considers the users coping sequence. This is of course relevant for all organizations that provide technical support, particular for management, managers, and technical support staff. Yet, there are also lessons to be learned for employees themselves. This study makes two contributions to the successful design of the technical support that are based on interviewee input.

First, timeliness is a key determinant in the users' coping sequences. Users in our study who experience high timeliness often reported high emotional load when contacting the help desk. Allowing users to specify the timeliness when submitting a technical support request helps them increase their perceived control over the situation and signals to them that technical support staff prioritizes the issue. Further, faster communication channels such as telephone or chat, rather than e-mail-based ticket systems, may provide better ways for interaction in these instances. In many especially larger companies this is already offered. However, some organizations prefer ticket systems for reasons of efficiency. Yet our findings show that for specific instances with high timeliness, such direct channels may reduce stress and should therefore be offered. Users on the other hand can learn from our study regarding their own management of timeliness. Problem avoidance may lead to high timeliness eventually. Thus, users should contact technical support directly after running out of leads for problem-solving rather than waiting until the problem becomes timely again. Additionally, company-provided preventive trainings for employees on effective ways to deal with discrepant IT events could constitute an effective measure.

Secondly, many study participants had applied long loops of unsuccessful problem-solving attempts. This not only takes up time and other resources but also leads to frustration and anger. Often, these prolonged problem-solving loops are due to high ambiguity. Users do not know whether they can solve the problems on their own. This is particularly frustrating when problems cannot be self-solved due to insufficient access right (e.g., for installing software updates). Thus, clear information on the competencies and responsibilities of the technical support are required. For example, the provision of understandable and precise information on common problems and an indication whether technical support needs to be or should be contacted may increase efficiency and reduce frustration among employees and technical support staff. Many companies already provide comprehensive, easy-to-use

and searchable wikis for their employees. One step further, AI-based chatbots could help users navigate the jungle of information, decrease ambiguity, and provide suggestions for a suitable further procedure.

5.3 Limitation & Future Research

There are several limitations to this study which offer room for future research on the topic. First, our dataset is limited to a single organization with generally high technology-competence. Further, the interviewees were predominantly of the same age, and have similar professional backgrounds. Hence, we cannot exclude that some of our findings depend on these characteristics and are thus not generalizable. Next, the model aims to capture the complexity of employees' use of coping strategies. Yet, in some instances, abstraction and parsimony were required to develop the model. Further, it is an empirical study based on 31 interviews. Therefore, we cannot rule out the possibility that the model fails to cover all possible paths on the way to contacting technical support. This provides opportunities for future research. Large-scale quantitative data collection would allow to add to the insights of this study by validating the routes and adding quantitative path frequencies. Combined with the insights from this qualitative study, a mixed-methods approach has the potential to develop rich insights into the role of technical support in coping.

Second, we collected data by using a retrospective approach which bears the risk of recollection bias. However, as discussed above, we tried to address this limitation by conducting interviews as soon as possible after the discrepant IT event was reported to technical support and therewith provide a methodological approach that allows to investigate individual coping sequences shortly after a discrepant IT event. Future research could address this by using methods that allow to accompany users direct at the moment of the discrepant IT event and during their coping sequences, e.g., by using methods like shadowing or ambulatory assessment.

Lastly, it was striking that only few emotion-based coping strategies were mentioned during the interviews. This contradicts, the results of Salo et al. (2020) where emotion-based coping strategies were found to be an important part of many individual coping sequences. There could be several reasons explaining this: 1) the users who contact the technical support know that there is a capable technical support and that there is always the option to ask them for help which. This may lead them to be less stressed and emotionally aroused. This explanation would indicate a strong effect of the existence of technical support on employee's stress – regardless of whether it is actually used. We do not propose this effect but additional research into the observation and possibility may be warranted. An alternative explanation would be that 2) interviewees followed a certain social desirability bias and were eager to present themselves as goal-oriented, rational problem solvers or were reluctant to admit to negative emotions and venting behaviors; 3) The observed discrepant IT events may simply not be severe enough to affect emotions strongly. However, while emotion-oriented coping was not observed frequently, there were reports of frustration and emotional load. More research is needed to understand the phenomenon in its entirety – whether it generates more data on emotion-oriented strategies or whether it explains their absence.

6 Conclusion

Technical support provision has the potential to contribute to a healthier usage of IT in an organizational context by mitigating technostress. However, to achieve this, we have to understand how and when users contact the technical support and which factors determine individual coping sequences. With this study, we addressed this need by providing a process model explaining the users' individual technostress coping sequences and superior coping routes. Additionally, we derive three components of user appraisal (timeliness, ambiguity, and emotional load) that describe the user's problem and state at the contact with technical support. Both are relevant for technical support to tailor their support provision to the individual needs. These components are not only associated with the discrepant IT event itself but also heavily depend on the users' choice of coping sequences. We provide design recommendations for a good technical support, as well avenues for future research.

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