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WORKAROUNDS IN INFORMATION SYSTEMS RESEARCH: A FIVE-YEAR UPDATE

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Research Paper

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Abstract

This paper complements an earlier (2019) literature review on workarounds in information systems research by including research that has influenced or been published in core IS outlets during the last five years (2018–2022). Our study captures research that strengthened, widened, and challenged theoretical insights from the previous review. It also provides additional insights and develops seven themes of theoretical insight. The 31 new papers and our updated analysis are most evident in the three themes: Workarounds and power, Temporality of workarounds, and Managing workarounds. We also found additional studies using the term 'workaround' differently to the extent that they have not applied the term to the same empirical phenomena, which questions the validity of some theoretical claims. We also found significantly more studies that used quantitative data-collection methods than the previous review.

Keywords: Workarounds, Review, Information Systems, Triangle of Reference.

1 Introduction

The literature review on workarounds in information systems research by Ejnefjäll and Ågerfalk (2019) summarized theoretical insights and discussed their validity based on: (1) the number of studies, (2) the data-collection methods the studies used, (3) their publication outlets, and (4) whether their described empirical workaround behaviour conformed to how research commonly used the term. They raised concerns about the validity of some theoretical claims since some studies used a different definition for a workaround and consequently used the term to denote a different empirical phenomenon. Their literature review included papers published until 2017. However, over the last five years (2018–2022), there has been an increase in published workaround research and, specifically, research using quantitative methods, which have strengthened, widened, and challenged previous theoretical insights and contributed to new ones. Therefore, we decided to complement their literature review by including research from 2018 to 2022, addressing the research question: What theoretical insights have IS research contributed about workarounds since 2018, and how do these contribute to our overall understanding of workarounds?

We use the triangle of reference (Ogden and Richard, 1923) and the conceptualization of workarounds developed by Ejnefjäll and Ågerfalk (2019) to investigate the validity of theoretical insights reported and to determine if studies have included behaviour that does not resonate with how research commonly have used the term 'workaround'. With this paper, we make two contributions. First, we provide an updated summary of the theoretical insights regarding workarounds in information systems. Second, we investigate the validity of these insights by discussing the number of studies, data-collection methods, publication outlets, and to what extent theoretical insights are based on studies that include behaviour that does not resonate with how research commonly used the term workarounds.

The paper proceeds as follows. Section 2 describes the conceptualization of workarounds developed by Ejnefjäll and Ågerfalk (2019). Section 3 presents how we replicated Ejnefjäll and Ågerfalk's (2019) literature search to include papers from the last five years and how we used the triangle of reference as an analytic framework. Section 4 summarizes the theoretical insights regarding workarounds. Section 5 analyses the relationship between the term workaround, theoretical knowledge regarding workarounds, and their empirical base to assess this knowledge's validity. Finally, Section 6 discusses our study's findings and implications, and how our analysis can inform future research and theorizing.

2   Conceptualization of Workarounds

Ejnefjäll and Ågerfalk (2019) studied how literature that has influenced or been published in the field of IS commonly used the term 'workaround' based on reported empirical accounts of workaround behaviour (Figure 1). Based on this analysis, they defined a workaround accordingly: When the designed path is blocked, a workaround provides an alternative path to the same goal without completely removing the block.
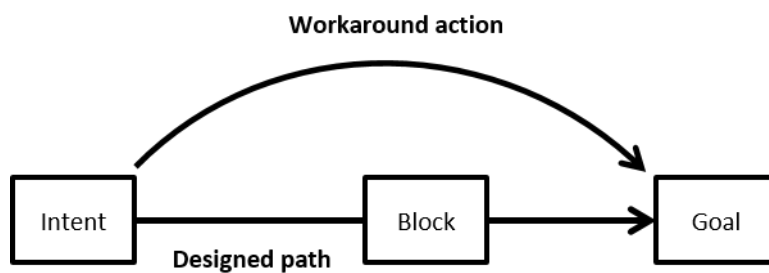

Figure 1.   Ejnefjäll and Ågerfalk's (2019) conceptualization of workarounds based on common use of the term 'workaround' in the reviewed papers.

The designed path comprises 'process design' and 'system design'. The word 'designed' is used rather than, for instance, 'intended' to convey that processes and systems might have flaws that their designers did not plan but designed nonetheless. 'Process design' comprises laws, regulations, rules, and policies that show how one should conduct work. Examples include privacy policies that regulate how users should log in to a system (Parks et al., 2017), guidelines for how users should handle enterprise social networks (Choudrie and Zamani, 2016), and work processes for administering medication (Halbesleben et al., 2010). 'System design' refers to the rules built into an IS (i.e., how one can work using the particular IS).

A block refers to something that hinders a user from satisfyingly completing work while following the designed path. The designed path may have a block for several reasons. For instance, blocks can arise due to flaws in the IS, such as a lack of features (Novak et al., 2012; Huuskonen and Vakkari, 2013) or a system design that does not support work practice (Azad and King, 2008; Laumer, Maier and Weitzel, 2017). However, in most cases, blocks occur in conjunction with a lack of resources (Ferneley and Sobreperez, 2006; Parks et al., 2017).

The workaround action refers to an alternative path with the same goal as the designed path and arises when the designed path is blocked. Notably, the workaround action requires intent since no papers included unintended actions, such as mistakes, as workarounds. Workarounds could lead to an increase or decrease in errors, but a mistake per se differs from a workaround since mistakes lack intentionality. The workaround will provide a solution without lifting the block in the designed path.

3   Literature Review Methodology

Replicating Ejnefjäll and Ågerfalk's (2019) search approach, we searched for the following terms: *workaround*, *workarounds*, *work-around*, and *work-arounds*. The first search was performed across the AIS Senior Scholars' basket of eight and resulted in five new papers that included the term in their title, abstract, or keywords. In the second search, we scanned all literature cited in these five papers with the same search terms and identified 13 additional publications with titles, abstracts, or keywords containing the term. This scan ensured the inclusion of the most important workaround literature that has influenced or been published in the field of IS. We checked these 18 papers against the conference papers included by Ejnefjäll and Ågerfalk (2019) and found no duplicate studies. We also included papers in proceedings from the official AIS conferences between 2018 and 2022 to find knowledge in the emerging research area of workarounds not yet published in journals (Whitley and Galliers, 2007). We searched titles, abstracts, and keywords in the proceedings of the four official AIS conferences, which resulted in 13 additional full research papers. Our literature search thus resulted in 31 documents: 14 journal papers and 17 conference papers. The additional full-text searches performed by Ejnefjäll and Ågerfalk (2019) provided input to their conceptualization but provided few theoretical insights regarding workarounds. Since the primary purpose of this update is to capture additional theoretical insights, we only included searches that resulted in papers categorized as central (title, abstract, or keywords containing the term). We summarize our search methodology in Figure 2.
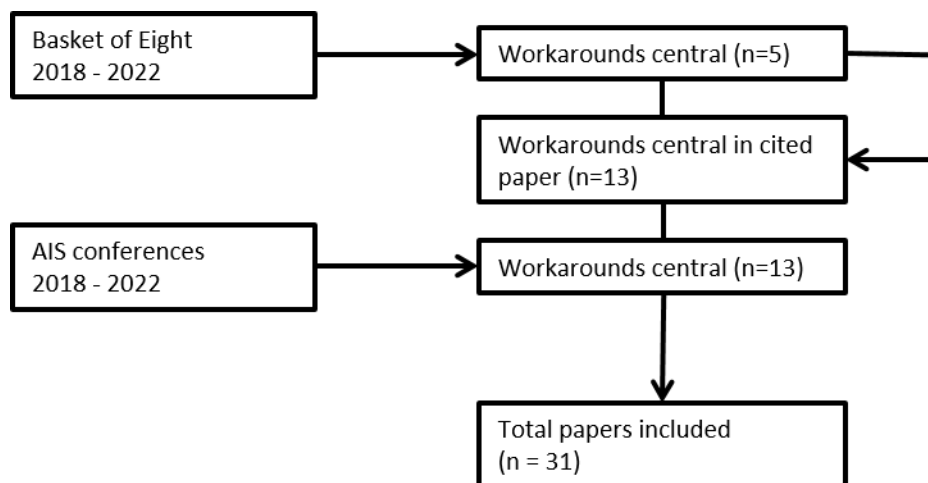

Figure 2.   Literature search methodology

These 31 papers were analyzed using reflexive thematic analysis (Braun and Clarke, 2006; 2013), beginning with the first author reading all documents with Ejnefjäll and Ågerfalk's (2019) modified version of Ogden and Richards' (1923, p. 11) triangle of reference as an analytic framework (see Figure 3). The model was used to analyze the relationship between 1) the term workaround (symbol), 2) theoretical insights (thought or reference), and 3) the empirical base of the relevant research and the described empirical workaround behaviour (referent). Ejnefjäll and Ågerfalk (2019) also used the model in a second step to analyze how the term workaround (symbol) has been defined and used (thought or reference) based on empirical accounts of workaround behaviour (referent) to develop a definition and conceptualization of workarounds. We will rely on their definition and conceptualization of workarounds and only replicate their first step.
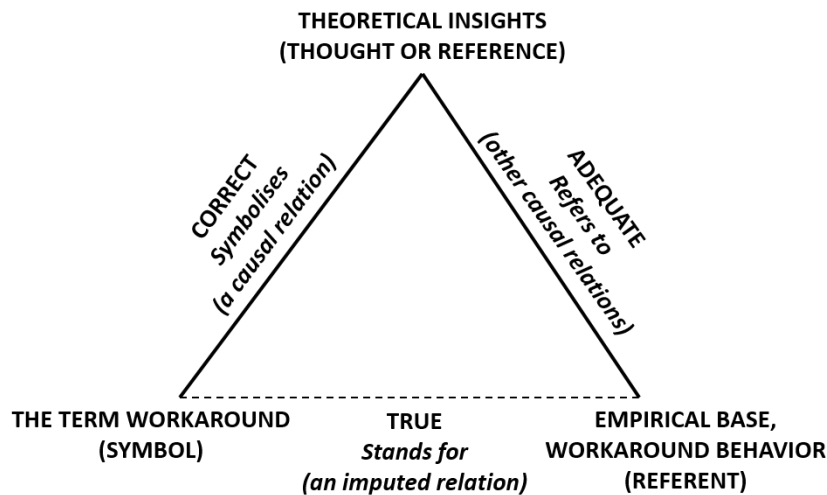
Figure 3.   Adaption of Ejnefjäll and Ågerfalk's (2019) modified version of Ogden and Richards' (1923, p. 11) triangle of reference.

Each paper was coded based on theoretical insights, empirical base, and workaround behaviour where Ejnefjäll and Ågerfalk's (2019 results informed the initial codes. The first author then generated initial themes (such as 'why people use workarounds'), some with sub-themes (such as 'misfit between systems and work practices'), by comparing and contrasting codes. While refining the analysis, each theme was checked to see if it worked with the results from Ejnefjäll and Ågerfalk (2019), and the reviewed papers (including reading several of the papers Ejnefjäll and Ågerfalk (2019) reviewed). Informed by the analysis, the first author could now capture new codes and refine them into new themes (such as 'temporality'). Before finalizing the themes, some themes were rearranged (such as moving 'conditions leading to workarounds' from 'categorizations and taxonomies' to 'why people use workarounds').

Ejnefjäll and Ågerfalk (2019) reported theoretical insights (such as 'workarounds resulting from a misfit between systems and work practices') without grouping them into themes (such as 'why people use workarounds'). Our review and analysis captured research that strengthened, widened, and challenged theoretical insights from the original study and also identified new insights. The 31 new papers and our updated analysis are most evident in the three themes: Workarounds and power, Temporality of workarounds, and Managing workarounds. Table 1 presents the number of papers related to each theme of theoretical insights from the previous review by Ejnefjäll and Ågerfalk (2019) and the number of papers added in this updated review (see Appendix A for a list of papers linked to each theme).

Themes of theoretical insight	Papers from previous review	Papers added in this review
Categorizations and taxonomies	7	2
Why people use workarounds	22	9
Consequences of workarounds	10	5
Workarounds and resistance	7	6
Workarounds and power	1	1
Temporality of workarounds	5	4
Managing workarounds	1	7

Table 1.   Themes of theoretical insights related to the number of papers from the previous review and our updated review.

4   Research on Workarounds

This section provides an up-to-date summary by integrating the findings from this updated review with those of Ejnefjäll and Ågerfalk (2019). Each sub-section represents a theme from the analysis. As we will see, many studies focused on how and why people use workarounds and the consequences of these workarounds, especially papers part of Ejnefjäll and Ågerfalk's (2019) original literature review.

4.1   Categorizations and Taxonomies

Koopman and Hoffman (2003) and Halbesleben, Wakefield, and Wakefield (2008) illustrated that workarounds are used to work around a block to achieve the original goal. They differentiated workarounds from other constructs such as errors, mistakes, deviance (Halbesleben, Wakefield and Wakefield, 2008), make-work, and kludge (Koopman and Hoffman, 2003). Alter (2014) also differentiates workarounds from non-goal-driven changes that occur due to inattention, accidents, or mistakes. Gasser (1986) and Koppel et al. (2008) suggested taxonomies for classifying workarounds related to actions. Gasser (1986) indicated that IS workarounds consist of data adjustment (enter inaccurate data to get accurate results), procedural adjustment (reverse organizational routines), and backup systems (use alternative or parallel systems). Gasser's taxonomy is used by Malaurent and Avison (2016) and Malaurent and Karanasios (2020), and also by Azad and King (2008), who extend the three categories with a fourth one: role adjustment. Koppel et al. (2008) developed a typology of workarounds when using barcoded medication administration (BCMA) systems, which Rack, Dudjak, and Wolf (2012) use.

4.2   Why People Use Workarounds

Studies commonly explained workarounds theoretically as resulting from a misfit between systems and work practices. The theory of organization-enterprise system fit (Strong and Volkoff, 2010) constitutes the most formalized theory in the reviewed literature. This theory identifies six misfit domains (functionality, data, usability, role, control, and organizational culture) and, in each domain, two types of misfit: deficiencies (problems arising from features that systems lack but users need) and impositions (problems arising from the system's characteristics). Strong and Volkoff (2010), Beijsterveld and Groenendaal (2016), van den Hooff and Hafkamp (2017), Malaurent and Avison (2015), and others linked workarounds to functionality misfits (both deficiencies and impositions). We also found earlier theories about organization-enterprise system misalignment (Soh and Sia, 2004) and several other studies, such as Goh, Gao, and Agarwal (2011), Davison and Ou (2013), and Spierings, Kerr, and Houghton (2017), that described workarounds as resulting from a misfit between systems and work practices without referring to the theory of organization-enterprise system fit or similar theories. Also, papers within medical informatics (Halbesleben, Wakefield and Wakefield, 2008; Debono et al., 2013) often explain workarounds as some form of misfit between systems and work practice without referring to any theory. While most of these studies described workarounds that individuals or groups of individuals devise, Beijsterveld and Groenendaal (2016) described workarounds as a solution for companies when they cannot affordably or practically change.

Studies also commonly explain workarounds as resulting from the conflict between top-down pressure and bottom-up constraints from day-to-day operational work. Top-down pressure can include company rules and policies (Choudrie and Zamani, 2016), enterprise systems requirements from headquarters (Malaurent and Avison, 2016), or external pressure from regulations or accrediting (Azad and King, 2012; Huuskonen and Vakkari, 2013). Bottom-up constraints can include material constraints, work ethos, and staff's lack of interest in IS (Azad and King, 2012; Choudrie and Zamani, 2016). Conflicting top-down pressure and bottom-up constraints have a lot in common with the theory of organization-enterprise system fit since enterprise systems requirements can represent top-down pressure and work practices bottom-up constraints (Choudrie and Zamani, 2016; Malaurent and Avison, 2016).

Two theories focus on the actor; Alter's (2014) theory of workarounds and Parks et al.'s (2017) unintended consequences of privacy safeguard enactment framework. The theory of workarounds (Alter, 2014) is a process theory where rational actors create workarounds by identifying obstacles and

deciding what to do about them. Thus, the theory explains workarounds as resulting from individual factors such as intentions, structural factors such as policies, the perceived need for a workaround, and the ability to design a workaround. Several papers, such as Li, Haake, and Mueller (2017) and Kopper and Westner (2017), cited Alter's (2014) definition of workarounds, but none used the theory. On the other hand, the unintended consequences of the privacy safeguard enactment framework (Parks et al., 2017) explain how individuals evaluate the implications of enacting privacy safeguards. If they perceive the unintended negative consequences to outweigh the intended positive consequences, they will use a workaround to bypass these privacy safeguards.

Several studies explain why people use workarounds without constructing or incorporating their insight into a theory. Flanagan et al. (2013) and Menon et al. (2016) investigated how clinical staff reasoned when working around systems and found that efficiency, memory (reminded of information), and awareness (recognizing important information) were the most common reasons. Zamani et al. (2019) and Zamani and Pouloudi (2021) found that developing workarounds was one user practice due to disillusionment and negative disconfirmation (the other two were discontinuing and reframing). Cram et al. (2020) and Wiener, Cram, and Benlian (2021) found that algorithmic control that monitors control behaviour corresponds to negative technostress and workaround use. In contrast, algorithmic control that oversees and guides worker behaviour corresponds to positive technostress and continuous intention. Woltje (2017) found that workarounds were likelier among experts than novices since the ability to perform workarounds comes with experience. On the other hand, Wiener, Cram, and Benlian (2021) found that workarounds were more likely among younger people. Azad and King (2008) and Van Der Sijs, Rootjes, and Aarts (2011) found that workarounds were possible within healthcare settings because of the interpretive flexibility characterized by the negotiated order dynamics of a professionally oriented organization.

4.3   Consequences of Workarounds

Most studies recognize that workarounds can have both positive and negative consequences. For example, Malaurent and Avison (2016) show that, while employees may use workarounds that involve an enterprise system to create viable organizational processes, they often decrease organizational control. Brooks, Oshri, and Ravishankar (2018) provide similar insights and demonstrated the wide range of effects workarounds have ranged, from encouraging creativity and problem-solving to hiding information.

Li, Haake, and Mueller (2017) and Safadi and Faraj (2010) focus on the positive consequences. Li, Haake, and Mueller (2017) show that workarounds help individuals effectively use information systems. Safadi and Faraj (2010) show how workarounds have positive consequences when used as feedback for improving systems during their implementation.

Several studies conclude that workarounds might have severe negative consequences, such as sabotage, deception (Alter, 2014; Ferneley and Sobreperez, 2006), and medical errors (Halbesleben, Wakefield and Wakefield, 2008; Koppel et al., 2008). However, most studies do not focus on, theorize, or quantify such consequences. Since several studies attribute workarounds to bad technology or dysfunctional routines, these workarounds may have prevented more errors than they caused.

There are contradictory findings regarding workarounds and implementation success. For example, Laumer, Maier, and Weitzel (2017) extend the IS success model (DeLone and McLean, 1992, 2003) with workarounds as a construct and concluded that user satisfaction negatively relates to workarounds. Similarly, Barrett (2018) use adaptive structuration theory (AST) (DeSanctis and Poole, 1994) with workarounds as a construct and concluded that workarounds positively predicted staff perceptions of EHR implementation success.

4.4   Workarounds and Resistance

It is unclear if and how workarounds theoretically relate to resistance. Bhattacherjee et al. (2018) present a taxonomy for user response to mandatory IT use where they classify workarounds as deviant behaviour linked to active resistance. Ferneley and Sobreperez (2006) view workarounds as separate, distinct, and subsequent phenomena that result from resistance. This resistance can be either positive or negative, and the following workarounds can have positive and negative consequences. Avoiding inappropriate procedures exemplifies positive resistance that can lead to workarounds that individuals require to complete work effectively. In contrast, deception illustrates negative resistance that can lead to workarounds such as sabotage or indolence. Alvarez (2008) also connect workarounds to resistance and showed how an enterprise system caused individuals to lose control and power and, therefore, directly challenged their existing professional identities and roles. As a result, individuals resisted the enterprise system by devising creative workarounds that produced a sense of reskilling to counter the deskilling that the new system created. Choudrie and Zamani (2016) and Davison et al. (2019) also connect workarounds to resistance and conclude that the workarounds they found illustrate positive resistance since individuals had organizational reasons for resisting. Patel, Poston, and Dhaliwal (2017) and Reiz and Gewald (2017) also connect workarounds to resistance, but they do not further theorize the relationship between resistance and workarounds. Papers connecting workarounds to resistance either do not define resistance or view it as behaviour intended to circumvent a system's design (Markus, 1983) where acts of resistance are employees' reactions to information systems that are used to monitor performance and enforce compliance with work processes.

There are, however, studies that question whether workarounds link to resistance. Malaurent and Avison (2015) instead view workarounds as an alternative to resistance, and Azad and King (2012; 2017), Button, Mason, and Sharrock (2003), and Zamani et al. (2019) state that workarounds do not necessarily involve resisting rules or not complying with system use but instead making rules and systems workable. Other studies present similar results and conclude that workarounds are by-products of end-users seeking operational efficiency (Spierings, Kerr, and Houghton, 2017) or attempting to facilitate one's tasks and activities (Zamani and Pouloudi, 2021) but without relating it to resistance. Some studies go even further and conceptualize workarounds as a knowledge-creation and -integration process (Safadi and Faraj, 2010) or suggest that workaround practices represent a logical and often necessary phase that enables cultural, linguistic, financial, and legislative misfits to be recognized and resolved, at least in the short term before putting more secure practices in place (Malaurent and Avison, 2015; Malaurent and Karanasios, 2020).

4.5   Workarounds and Power

Alvarez (2008) and Beerepoot et al. (2019a) are the only papers connecting workarounds to power. Alvarez (2008) shows how an enterprise system caused individuals to lose control and power. The system was perceived as fragmented and contributed to increased dependence on other staff that did not exist before. The rules inscribed into the system limited staff access to information and thereby their ability to provide service. Staff used workarounds to circumvent the system's intended design to regain their power. Beerepoot et al. (2019a) differentiate between episodic power (power over) and systemic power (power to). Episodic power is resource-based and the authors identified two types of episodic power: hierarchical power that was exerted by one actor over another actor and restrictive power that was exerted by the system over actors. Systemic power is related to human agency and actors' abilities to use technology in ways that deviate from the intentions of the designer. Beerepoot et al. (2019a) show how health information systems restrictions exerted episodic power over staff and how they exerted their systemic power when devising workarounds. They also show how, for instance, physicians used their episodic power when failing to enter medication into the IS forcing nurses to use a workaround instead of following the procedure.

4.6   Temporality of Workarounds

Most papers present workarounds as stable practices. Azad and King (2012), Choudrie and Zamani (2016), and Davison et al. (2019) describe institutionalized workarounds, which further reinforce this view. Studies that describe change almost exclusively describe the situation before and after an IS implementation (Alvarez, 2008; Boudreau and Robey, 2005), i.e., how and why people started to use workarounds. But there are exceptions. Zhou, Ackerman, and Zheng (2011) describe workarounds that disappeared when staff had enough knowledge and experience in using the system and reached their comfort zone. Malaurent and Avison (2016) and Malaurent and Karanasios (2020) describe the redesign of an IS to remove the need for some workarounds while others were adopted or prevented.

4.7   Managing Workarounds

There are also papers that describe how workarounds can be found and managed. Malaurent and Avison (2016) and Malaurent and Karanasios (2020) use activity theory (Engeström, 1999) to analyze workarounds and design solutions that reconcile global and local needs. As a result, some workarounds were adopted (formalized) or allowed to continue, while others were prevented. There are other studies with similar intentions. Beerepoot and Van De Weerd (2018) develop the workaround snapshot approach, inspired by Alter's (2013) work system snapshot, to evaluate how to handle workarounds. Wibisono, Sammon, and Heavin (2022) suggest an approach to visually model workarounds, making it possible to document and better understand workarounds. Beerepoot et al. (2019b) analyse workarounds related to knowledge, patient involvement, and collaboration, and whether the workarounds should be accepted or rejected. Van de Weerd et al. (2019) extended the work of Ferneley and Sobreperez (2006). They develop a framework of workaround features focusing on temporary or routinized, unavoidable or avoidable, and unplanned or deliberate workarounds, and whether the workarounds should be prevented, adopted, redesigned, or ignored. Kretzer and Maedche (2018) demonstrate that enterprise recommendation agents and social nudges have the potential to reduce individuals' need to develop and use workarounds. Weinzierl et al. (2020) implemented a deep learning-based approach for detecting workarounds in event logs. An evaluation with three public real-life event logs shows that the method can best identify workarounds in standardized business processes with fewer variations and a higher number of different activities. Unlike Malaurent and Avison (2016) and Malaurent and Karanasios (2020), these studies do not include the implementation of the suggestions.

5 Empirical Base

To investigate the validity of the theoretical insights outlined in the previous section, we compared each of the themes to (a) the number of studies, (b) the data-collection methods the studies used, (c) their publication outlets, and (d) whether their described empirical workaround behaviour conforms to Ejnefjäll and Ågerfalk's (2019) conceptualization of workarounds (see table 2).

Themes of theoretical insight	Number of studies	Data-collection methods	Publication outlet
Categorizations and taxonomies	9	Interviews, Observations, Documents	Journal
Why people use workarounds	31	Interviews, Observations, Documents, Survey	Journal, Conference
Consequences of workarounds	15	Interviews, Observations, Documents, Surveys	Journal, Conference
Workarounds and resistance	13	Interviews, Observations, Documents	Journal, Conference
Workarounds and power	2	Interviews, Observations, Documents	Journal, Conference
Temporality of workarounds	9	Interviews, Observations Documents	Journal, Conference
Managing workarounds	8	Interviews, Observations, Documents, Experiment	Journal, Conference

Table 2.   Themes of theoretical insights related to the number of studies, data-collection methods, and publication outlet

Three themes have attracted research attention from more than 10 studies: (1) Why people use workarounds, (2) Consequences of workarounds, and (3) Workarounds and resistance. There is a relatively high consensus regarding why people use workarounds and the consequences of workarounds. At the same time, there are conflicting findings regarding if and how workarounds theoretically relate to resistance.

We found no significant differences when comparing data-collection methods used within each theme. Some themes contained insights from one or more quantitative studies, but there were not enough quantitative studies to draw conclusions. All themes except two contained an expected mix of papers published in journals and conferences. The two exceptions were: 1) Categorizations and taxonomies which contained only journal publications, and 2) Managing workarounds which contained a high degree of conference papers.

Ejnefjäll and Ågerfalk (2019) showed that Parks et al. (2017), Ferneley and Sobreperez (2006), and Alter (2014) describe workaround behaviour (referent) in ways that did not resonate with how research commonly used the term (symbol). Our review also found papers that describe workaround behaviour in ways that do not resonate with how researchers commonly use the term.

Zamani et al. (2019) and Zamani and Pouloudi (2021) base their findings on the same case where they analyzed user blogs that provide narratives on user interactions with iPads and found that developing workarounds is one user practice due to disillusionment and negative disconfirmation (the other two were discontinuing and reframing). The authors provide two examples of workarounds: Users installed DropBox since they missed universal file storage and the use of an external keyboard for type-intensive tasks. These actions do not constitute a workaround since no designed path with the same goal exists. If

someone wants universal file storage or engages in type-intensive tasks on an iPad, installing an app or using an external keyboard is a solution.

Woltjer (2017) uses surveys and does not provide any empirical examples of workarounds. Still, from his survey questions, it is reasonable to assume that responders have included actions inconsistent with the term's common use. One question used to measure the frequency of workarounds:

> *How often has the following situation occurred at your work place: That you have come up with a solution to an information security problem because the policies did not indicate in a good enough way how you should handle the situation?*
>
> *(Woltjer, 2017 p 418)*

The question includes general problem-solving and solutions that do not work around a block and solutions that solve the problem instead of working around it.

There are also conference papers that may include workaround actions that do not resonate with how research commonly uses the term. However, it is impossible to determine since they do not contain sufficient descriptions of the workaround actions.

Four insights are entirely based on studies that include actions that do not constitute a workaround according to the term's common use: (1) the theory of workarounds, (2) the unintended consequences of privacy safeguard enactment framework, (3) workarounds result from disillusionment and negative disconfirmation, and (4) workarounds are more likely among experts than novices. Even though this does not significantly impact the validity of the theoretical insights at the themes level, this raises questions regarding the validity of both theories focusing on the actor when explaining why people use workarounds. Even though most studies that connect workarounds to resistance only include actions that constitute a workaround according to the term's common use, the study by Ferneley and Sobreperez (2006) is the most influential. All workaround actions that illustrate negative resistance in Ferneley and Sobreperez (2006) consist of actions that diverge from how research commonly used the term workarounds. If actions demonstrating negative resistance are not workarounds and all described workarounds are examples of positive resistance, is it theoretically meaningful to connect workarounds to resistance?

6   Discussion and Conclusion

We complemented Ejnefjäll and Ågerfalk's (2019) literature review on workarounds in information systems research by including research that has influenced or been published in core IS outlets during the last five years (2018 - 2022). In the analysis, we used the triangle of reference to analyze the relationship between 1) the term workaround, 2) theoretical insights, and 3) the empirical base of the relevant research and the described empirical workaround behaviour. As a result, our review and analysis captured new theoretical insights while also expanding on the theoretical insights presented by Ejnefjäll and Ågerfalk (2019).

There has been an increase in published workaround research over the last five years (2018–2022), specifically research using quantitative methods. Ejnefjäll and Ågerfalk's (2019) literature search across the AIS Senior Scholars' basket of eight resulted in 10 papers categorized as central (published before 2018) while our updated search found five papers published in the basked of eight during the last five years (2018 - 2022). Only one paper (Laumer, Maier, and Weitzel, 2017) in Ejnefjäll and Ågerfalk's (2019) review used a quantitative data-collection method (survey) compared to six additional papers in our review, which suggests that the area of workarounds now attracts a broader range of data collections methods. Three of these papers used qualitative and quantitative data-collection methods in the same study.

Our updated search and analysis developed seven themes of theoretical insight. The added literature affected all themes but to a varying degree. 'Categorizations and taxonomies' was the least affected theme where our updated search only added two studies that used previous categorizations without extending them or adding new ones.

While the additional papers from our review mainly strengthened the most common theoretical explanations in the theme 'Why people use workarounds' we also found studies with new insights, such as workarounds result from disillusionment and negative disconfirmation (Zamani et al., 2019; Zamani and Pouloudi, 2021) and that workarounds are more likely among younger people (Wiener, Cram, and Benlian, 2021). However, some of these studies described workaround behaviour that deviated from how researchers commonly used the term which raises questions regarding their validity.

The additional papers from our review in the theme 'Consequences of workarounds' strengthened previous findings and demonstrated the wide range of both positive and negative effects of workarounds. Our main contribution to the theme is the quantitative study by Barrett (2018), which concluded that workarounds positively predicted staff perceptions of EHR implementation success. This contradicts findings from Laumer, Maier, and Weitzel (2017) who concluded that user satisfaction negatively relates to workarounds.

The six papers added to the theme 'Workarounds and resistance' are as divided as previous studies on whether workarounds are theoretically connected to resistance or not. Two papers connect workarounds to resistance while four questions this link.

Our addition to the theme 'Workarounds and power' is significant since there are only two papers connecting workarounds to power (one from our review and one from the previous one). The study by Beerepoot et al. (2019a) has a stronger focus on power than the study by Alvarez (2008) and contributes by connecting workarounds to different aspects of power and by providing examples of how workarounds connect to the different aspects.

Most papers in the original and updated review present workarounds as stable practices. Two out of the three papers that present workarounds in a different way in the theme 'Temporality of workarounds' are from our updated review. The study by Malaurent and Karanasios (2020) from our review is based on the same case as Malaurent and Avison (2016) from the previous review where they describe how the redesign of an IS removed the need for some workarounds while others were adopted or prevented. Zhou, Ackerman, and Zheng (2011) described workarounds that disappeared when staff had enough knowledge and experience in using the system and reached their comfort zone.

All papers except one in the theme 'Managing workarounds' are from our updated review. Malaurent and Avison's (2016) paper from the original review describes in detail how workarounds were identified and analyzed and how solutions were designed to reconcile conflicting global and local needs. Most papers from our review lack this depth and detail since they are conference papers but they present several interesting approaches on how to detect (Weinzierl et al., 2020), visualize (Beerepoot and Van De Weerd, 2018; Wibisono, Sammon, and Heavin, 2022), evaluate (Beerepoot et al., 2019b; Van de Weerd et al., 2019) and reduce (Kretzer and Maedche, 2018) workarounds.

Our updated review has significantly contributed to three themes: Workarounds and power, Temporality of workarounds, and Managing workarounds. All three themes contain promising insights but need more research attention, and the IS field seems ideal for conducting this research with its interest in phenomena that emerge when the social and the technical interact (Lee, 2001). Only two papers explicitly connect workarounds to power. Both provide relevant findings, but more studies are needed to increase our understanding of how power affects the need for, the ability to create, and the effect of workarounds. Most papers present workarounds as static practices. Is this true or is or is this view just overrepresented in research? Moreover, several conference papers offer exciting ideas regarding how to find and handle workarounds, but there is a lack of studies that describe how it has been and can be done.

We also found additional studies that have defined and used the term workaround differently to the extent that they have not consistently applied the term to the same empirical phenomena. Even though these studies did not significantly impact theoretical insights on the themes level, it raises questions regarding some theoretical claims regarding workarounds.

Our review indicates that there is still room for more research that uses the term workaround in line with how research commonly uses the term. The recent increase in studies using quantitative data-collection methods is welcome, and we hope this trend continues and presents findings that expand and challenge

current theoretical insights. Several conference papers contributed to our updated review, and we anticipate seeing their insights developed further into journal papers published in the coming years.

In this study, we replicated Ejnefjäll and Ågerfalk's (2019) approach and conducted our initial search across the AIS Senior Scholars' basked of eight journals. On February 17, 2023, three additional journals (Decision Support Systems, Information & Management, and Information and Organization) were added to this list. A next step could be to replicate the search approach across the updated Senior Scholars' list of eleven journals.

7   Acknowledgements

Appendix A: Papers Linked to Each Theme

Themes of theoretical insight	Papers from previous review	Papers added in this review
Categorizations and taxonomies	Gasser, 1986; Koopman and Hoffman, 2003; Azad and King, 2008; Halbesleben, Wakefield and Wakefield, 2008; Koppel, 2008; Alter, 2014; Malaurent and Avison, 2016	Rack, Dudjak, and Wolf, 2012; Malaurent and Karanasios, 2020
Why people use workarounds	Gasser, 1986; Soh and Sia, 2004; Halbesleben, Wakefield and Wakefield, 2008; Azad and King, 2008; 2012; Koppel et al. 2008; Safadi and Faraj, 2010; Strong and Volkoff, 2010; Goh, Gao, and Agarwal, 2011; Van Der Sijs et al., 2011; Rack et al, 2012; Davison and Ou, 2013; Huuskonen and Vakkari, 2013; Alter, 2014; Beijsterveld and Groenendaal, 2016; Choudrie and Zamani, 2016; Malaurent and Avison, 2016; Menon et al., 2016; van den Hooff and Hafkamp, 2017; Li, Haake, and Mueller, 2017; Parks et al., 2017; Spierings, Kerr, and Houghton, 2017	Debono et al., 2013; Flanagan et al., 2013; Malaurent and Avison, 2015; Woltje, 2017; Zamani et al., 2019; Cram et al., 2020; Malaurent and Karanasios, 2020; Wiener, Cram, and Benlian, 2021; Zamani and Pouloudi, 2021
Consequences of workarounds	Ferneley and Sobreperez, 2006; Halbesleben, Wakefield and Wakefield, 2008; Koppel et al., 2008; Ignatiadis and Nandhakumar, 2009; Safadi and Faraj, 2010; Rack et al., 2012; Alter, 2014; Malaurent and Avison, 2016; Laumer et al., 2017; Li, Haake, and Mueller, 2017	Debono et al., 2013; Barrett, 2018; Brooks, Oshri and Ravishankar, 2018; Davison et al., 2019; Malaurent and Karanasios, 2020
Workarounds and resistance	Button, Mason, and Sharrock, 2003; Ferneley and Sobreperez, 2006; Alvarez, 2008; Azad and King, 2012; Choudrie and Zamani, 2016;	Malaurent and Avison, 2015; Azad and King 2017; Bhattacherjee et al., 2018; Davison et al., 2019; Zamani et al., 2019; Malaurent and Karanasios, 2020

	Patel, Poston, and Dhaliwal, 2017; Reiz and Gewald, 2017	
Workarounds and power	Alvarez, 2008	Beerepoot et al., 2019a
Temporality of workarounds	Soh and Sia, 2004; Alvarez, 2008; Azad and King, 2012; Choudrie and Zamani, 2016; Malaurent and Avison, 2016	Boudreau and Robey, 2005; Zhou et al., 2011; Davison et al., 2019; Malaurent and Karanasios, 2020
Managing Workarounds	Malaurent and Avison, 2016	Beerepoot and Van De Weerd, 2018; Kretzer and Maedche, 2018; Beerepoot et al, 2019b; Van de Weerd et al, 2019; Malaurent and Karanasios, 2020; Weinzierl et al., 2020; Wibisono, Sammon, and Heavin, 2022

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