WORKAROUNDS IN RETAIL WORK SYSTEMS: PREVENT, REDESIGN, ADOPT OR IGNORE?

Research paper

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Abstract

We conducted a case study in a Dutch supermarket chain in order to explore the emergence of workarounds in the retail environment. We studied what types of workarounds occur during the use of retail information systems and how manager can handle the identified workarounds once they become aware of them. The data was acquired qualitatively through interviews, observations, and document analysis, and validated by means of an online survey. After identifying and classifying 29 workarounds, a conceptual framework was developed that links workaround features to workaround categories and then to certain actions as response to them, namely prevent, redesign, adopt and ignore. This study contributes to existing research by categorizing workarounds in an unexplored domain and developing a conceptual framework of workaround categories and responses. We were able to identify patterns of relationships between types of workarounds, some of them similar to those found for other industries and others that appear to be specific to retail work systems, probably due to the inherent characteristics of retail work systems.

Keywords: Workarounds, Retail industry, Workaround classification, Responses to workarounds.

1 Introduction

Workarounds occur when users start shaping a technology to their own needs; particularly by intentionally using an Information System (IS) in ways it was not designed or by executing bypasses to complete work (Gasser, 1986). Ferneley and Sobreperez (2006) define workarounds as "informal temporary practices for handling exceptions to workflow". In current literature, researchers have often focused on the negative effects of workarounds (Azad and King, 2008; Outmazgin and Soffer, 2013; Ferneley and Sobreperez, 2006; Rathert et al., 2012; Yeung et al., 2012). However, other studies show a more positive view on workarounds, as they can be used to improve business processes (Halbesleben and Rathert, 2008; Beerepoot and van de Weerd, 2018). As Alter (2015b) stated: "Workarounds are often a springboard for change" and can be viewed as creative acts and sources of future improvements.

Several fields have been the setting of workaround studies, most of all healthcare (Azad and King, 2008; Djalali et al., 2015; Schiff and Zucker, 2016; Beerepoot and van de Weerd, 2018; Beerepoot et al., 2019), but also the transport industry (Ignatiadis and Nandhakumar, 2009; Handel and Poltrock, 2011) and service industry (Ferneley and Sobreperez, 2006; Davison and Ou, 2013). However, studies on workarounds in the retail industry are underrepresented. One factor that distinguishes retail from other industries such as healthcare is the sales triangle. Whereas is in healthcare there exists a continuous interplay between

caregivers such as nurses and doctors with patients, in retail work there exists a sales triangle: managers, salespeople and customers (Dar, 2011). Within this triangle, complex dialogues are at play. For example, in call centres, some managers attempt to control the behaviour of salespeople using scripts and procedures. In turn, some workers were found to resist such control (Bain and Taylor, 2000) by deviating from management objectives and expressing commitment to a customer in favour of management (Callaghan and Thompson, 2002; Fuller and Smith, 2991; Wray-Bliss, 2001). Such resistance may lead to the emergence of workarounds in sales settings (Darr, 2018). As of yet, no studies have focused specifically on deviations from prescribed processes by salespeople, their positive and negative characteristics and the possibilities for addressing them.

The goal of this research is to identify workarounds in a retail setting, classify them and develop a conceptual framework of actions that can be taken in response to them. In order to achieve this goal, this paper seeks to answer the following two research questions: *What types of workarounds occur in retail work systems?* and *Which actions can be taken in response to these different types of workaround*s? In an attempt to answer these questions, an empirical qualitative study was performed in the form of interviews, observations, document analysis and a survey. Our study has several contributions. First, we report a prototypical case study, where we identify and classify workarounds in an underexplored environment, namely the retail industry. Second, our results give insight into different workaround types, workaround features, and responses to workarounds in the retail sector, as well as some insights into exemplar relations between those three.

The rest of this paper is organized as follows. In the next section, we review the existing literature related to workarounds. In Section 3, we describe the approach taken to carry out the research. Section 4 presents the outcome of the interviews, observations, survey and document analysis. In Section 5, the results are discussed as well as the encountered limitations. Finally, in Section 6, we conclude and present ideas for future work.

2 Related Literature

Workarounds have been studied by many researchers. Topics that have been studied are, amongst others, the identification of workarounds (Azad and King, 2008; Djalali et al., 2015; Schiff and Zucker, 2016; Beerepoot and van de Weerd, 2018), costs and benefits of workarounds (Petrides et al., 2004), impact of workarounds on organizational control (Ignatiadis and Nandhakumar, 2009), and motivations for workarounds (Handel and Poltrock, 2011). Alter (2014, 2015a, 2015b) developed a theory of workarounds that outlines why and how workarounds are created. In the following sections, we provide an overview of widely-used workaround typologies, and of consequences and responses to workarounds.

2.1 Workaround typologies

Several scholars have developed workaround typologies and classifications. Alter's theory of workarounds included a classification scheme that contains 11 categories (Alter 2014, 2015a, 2015b). It was developed by combining the results of an extensive literature review, and views workarounds in terms of their operational goals. Another typology was suggested by Outmazgin (2013). He proposed six distinct categories and 24 related environmental factors. The categories were further elaborated on by Outmazgin and Soffer (2016). Friedman et al. (2013) developed a three-dimensional typology based on the following key features of workarounds: temporary versus routinised, unavoidable versus avoidable, and unplanned versus deliberate. Temporary workarounds form a short-term solution to a temporary issue, while routinised workarounds have become part of the process. Avoidable workarounds are bypasses that are not particularly necessary, whereas unavoidable workarounds result from tasks that require a fix to be completed. Deliberate workarounds are the result of planned initiatives that often add steps to the process and hence time and/or effort, and unplanned workarounds occur in unforeseen situations.

Ferneley and Sobreperez (2006) found that workarounds are resultant behaviours from positive and negative resistance to IS. Based on the analysis of two case studies, they define three "strands of workarounds," i.e., harmless, hindrance and essential workarounds. A harmless workaround takes place when users deviate from the standard process, without affecting the workflow or captured data. A hindrance workaround occurs when users find that the standard workflow of the process is "too time consuming, onerous or difficult". An essential workaround is one that is, in the eyes of the users, necessary in order to complete a process.

2.2 Consequences and Responses to Workarounds

Many studies focus on the potentially negative consequences of workarounds (Ferneley and Sobreperez, 2006; Rathert et al., 2012; Yeung et al., 2012), and minimizing their occurrences is what is strived for (Rack et al., 2012). However, there is an increasing belief that workarounds do not necessarily have a negative impact. Positive results have been found, such as the maintenance of a smooth process (Niazkhani et al., 2011), the ability to improvise in favour of clients (Tucker, 2009) and the formation of sources for future improvement (Alter, 2014). Halbesleben et al. (2008) also claim that there are positive influences of workarounds, although organizations often cannot grasp the workaround itself or the type of solution represented. Beerepoot and van de Weerd (2018) recognise the difficulty for organisations to capture solutions resulting from workarounds. They proposed an approach that uses knowledge of workarounds to enable continuous improvement in organizations. In particular, they developed the Workaround Action Matrix which provides four possible actions to deal with workarounds, namely: prevent, adopt, redesign and ignore.

3 Research Method

In order to answer the research questions, we conducted an explorative case study (Yin, 2013). Our aim was to identify workarounds, categorize them and develop a conceptual framework of responses to such workarounds in order to advance understanding of this topic (Cousin, 2005). Our case organization, a Dutch supermarket chain, functions as an instance of retail work systems. Given that most large retail organizations have similar processes (e.g. sales, restocking) and use similar ISs (e.g. scheduling systems, shift reporting systems), the organisation we selected constitutes a typical case of the phenomenon of interest (Gerring, 2007), i.e. the use of workarounds in retail organizations.

3.1 Case organization

The case study was executed at a Dutch supermarket chain, holding one of the largest market shares in the Netherlands with hundreds of stores. A new intranet was implemented in 2016, which functions as an online platform that facilitates all ISs that employees use during their in-store work, e.g. tools which support scheduling, HACCP[1] checks and shift reporting. It also contains all manuals and work instructions as well as a direct link to their work email. This research focuses on the workarounds that occur while employees perform tasks on this platform.

The research method is based on empirical data collection by means of mainly interviewing and observing team managers of the supermarket operating in three departments, i.e., sales of non-perishable goods, sales of perishable goods and counter, in four stores in the greater Amsterdam area, in The Netherlands. The store managers have granted the second author access to perform this research in their work environment from March to June 2018. The particular stores differ in size and customer type. Team managers were chosen as the focus since they are the ones responsible for executing the prescribed processes in-store. In this manner, insights would be gained on the workarounds occurring during the use of the platform in its real-life context. Second, a larger number of other team managers from different stores in The

[1] Hazard Analysis and Critical Control Points.

Netherlands of the same organization responded to a survey based on information collected through the interviews, observations and document analysis.

3.2 Data collection

For our data collection, we focused on workarounds in the retail work system. Alter (2013) defines a work system as "a system in which human participants and/or machines perform work (processes and activities) using information, technology and other resources to produce specific products/services for specific internal and/or external customers". This implies that we observe not only the ISs that are worked around, but position them in a larger context of processes, activities and employees.

The data used in this study was collected in two phases. In the first phase, the second author carried out interviews and observations. The interviews were semi-structured, covering a number of predetermined topics, but with the opportunity to ask spontaneous questions and converse with the interviewees (Patton, 2005). In addition, the interviewees were observed during the execution of their tasks on the platform. The observations were performed in the exploratory participant form (Guest et al., 2012). We interviewed and observed 12 team managers. Team managers are responsible for managing and motivating a team of grocery clerks (the Sales Team Managers, STMs) and cash desk staff (the Cash Desk Team Managers, CDTMs). We selected one team manager per department (non-perishable, perishable and counter) per store. Therefore, visiting four stores, the sample consisted of 12 team managers. The data collected from the interviews were transcribed and the data collected from the observations were manually logged in observation notes. Interviews and observations often merged when interviewees would show examples of how they interacted with the supermarket's ISs. Finally, documents were collected that described the processes used in the supermarkets.

In the second phase of our study, we set out a survey among supermarket team managers of different stores in The Netherlands of our case organization. The intention of this survey was to validate the workarounds that we identified, i.e., to confirm their existence. The survey was distributed through social media, specifically by posting it on the supermarket's team manager community on Facebook. Only team managers that are confirmed by the supermarket can join this community. Furthermore, we specifically invited respondents that had experience with the intranet that was implemented in the organisation in 2016. The survey was set up in two different versions: one for CDTMs and one for STMs, since both groups use different workarounds in different parts of the information system. The respondents were presented a list of all identified workarounds and were asked to indicate for each workaround whether they use it or not. The total number of respondents was 292, of which 138 were CDTMs and 154 were STMs.

3.3 Data analysis

The collected data were coded in two cycles (Miles et al., 2013) in Atlas.ti, a software application for qualitative data analysis. The interview transcripts and observation notes were ordered per store and made anonymous. In the first inductive coding cycle, the second author identified workarounds by using process coding, in which verbs were used to denote observable actions in the interview transcripts (Miles et al., 2013). In this way, we could analyse the "the dynamics of time", namely the sequence in which different actions took place (Miles et al., 2013). The codes were then compared to the results of the document analysis to determine in what ways the team managers deviate from the prescribed processes, i.e., in order to identify the workarounds. The result of this first cycle was a list of workarounds with motivations and characteristics. The workarounds and their motivations and characteristics were discussed with the first author of the paper and clarified when necessary. This final set of identified workarounds was then validated through the distribution of the survey used to confirm the existence of such workarounds.

Next, the first and second author continued with hierarchical second level coding, i.e., all codes were mapped into categories, in such a way that broader patterns could be identified and interpreted. In order to determine the types of the identified workarounds, we used a deductive analytical approach (Miles et

al., 2013), where we drew from the literature to derive different workaround types, features and response actions. First, we analysed the key features of the workarounds with the aid of the three-dimensional typology developed by Friedman et al. (2013), i.e., "temporary" versus "routinised", "unavoidable" versus "avoidable" and "unplanned" versus "deliberate". This typology was particularly useful because it focusses on the conceptual features of workarounds without assigning any negative or positive value to them. Second, we used the interviewees' own assessments of the workarounds to label the workarounds according to the terminology defined by Ferneley and Sobreperez (2006), i.e., "essential", "hindrance" and "harmless" workarounds. Their terminology enabled us to capture the process participants' opinions about the nature of the workarounds in 'categories' (coined "strands" by Ferneley and Sobreperez). The outcomes of both analyses were discussed with the other authors. We cross-referenced the results to check whether there existed "key features" specific for a particular workaround category. Third, the most appropriate response was determined for each workaround, as discussed with each interviewee, with the help of the Workaround Action Matrix (Beerepoot and van de Weerd, 2018). This action matrix considers four possible actions – "prevent", "adopt", "redesign" and "ignore". Finally, we used the results of the cross-reference and the actions in response to the workarounds to develop a conceptual framework of workaround responses.

4 Results

A set of 29 workarounds was identified based on the analysis of 12 interviews and observations. Table 1 lists each workaround, whether it is applicable to only STMs, CDTMs or both, and the frequencies with which they were pointed out to the interviewer in the interviews and the survey, respectively. The survey yielded a total of 292 responses. A substantial part of the set of workarounds was recognised by a large number of team managers. There were also some lower frequencies, although some workarounds may be applicable to only one type of team manager.

ID	Workaround description	Application context	Frequency (interviews)	Frequency (survey)
W1	Still using the previous, outdated platform	STM, CDTM	4	247
W2	Using another app to retrieve a product number necessary to place an order via the order app	STM, CDTM	1	236
W3	Handling same-day schedule switches manually	STM, CDTM	3	222
W4	Using the authorisation app to find personnel codes	STM, CDTM	4	210
W5	Picking a random category when submitting a question to the helpdesk because a fitting category does not exist	STM, CDTM	2	163
W6	Using a shadow administration for restocking planning	STM	1	159
W7	Monitoring colleague scheduling	STM, CDTM	1	157
W8	Manually assigning activities to employees before shift	STM, CDTM	3	150
W9	Using mobile phones instead of platform	STM, CDTM	1	130
W10	Authorising non-team managers for team manager tasks	STM, CDTM	1	126
W11	Monitoring colleague stock counts	STM	3	115
W12	Using expected cargo as guideline for scheduling	STM	1	110
W13	Use of outdated app for floor plans	STM	2	107
W14	Using an alternative system to create restocking planning	STM	1	93
W15	Solving problems orally instead of via system	STM, CDTM	7	92
W16	Using order app for alternative goal: retrieving item numbers	STM, CDTM	1	86
W17	Using Excel for scheduling with self-generated norm	STM	4	78
W18	Manually rejecting above-norm schedule switches	STM, CDTM	2	77

W19	Sharing shift report via text messages	STM, CDTM	3	73
W20	Creating shift report in Google Drive	STM, CDTM	5	72
W21	Manually keeping track of employee availability	STM, CDTM	3	51
W22	Sharing shift report via designated app and Google Drive	STM, CDTM	1	38
W23	Using shortcuts to applications on platform	STM, CDTM	2	37
W24	Creating shift report in Word	STM, CDTM	3	34
W25	Monitoring self-checkout percentages	CDTM	1	27
W26	Creating shift report in a notebook	STM, CDTM	1	25
W27	Manually keeping track of information	STM, CDTM	3	11
W28	Needing private email to access the cargo tracker	STM	1	6
W29	Using destruction rates as turnover indication	STM, CDTM	1	4

Table 1. Identified workarounds, ordered according to the number of times confirmed in the survey.

The following sections discuss the discovered patterns, features, categories and responses with the illustrative help of a running example, namely workaround W20 (cf. Table 1). W20 represents the act of writing the shift report in a Google Drive document instead of using the application specifically designed for it. Writing a shift report is compulsory and serves as a form of evaluation. The process prescribes that "*the shift report shall be filled in by the team manager after every shift*" and "*when preparing for the next shift, the team manager shall read the report of the previous shift*". The online platform offers an application in which the report should be written. Once saved, the report is accessible for all (team) managers. Figure 1 depicts a screenshot of this application. When W20 occurs, team managers systematically avoid the use of the application and write and share their reports via Google Drive instead. As team manager 1 explains: *"it's clearer, and editable for everyone"* and *"you can write whatever you deem necessary… in [the shift report application] you have to fill in all these unnecessary things"*.

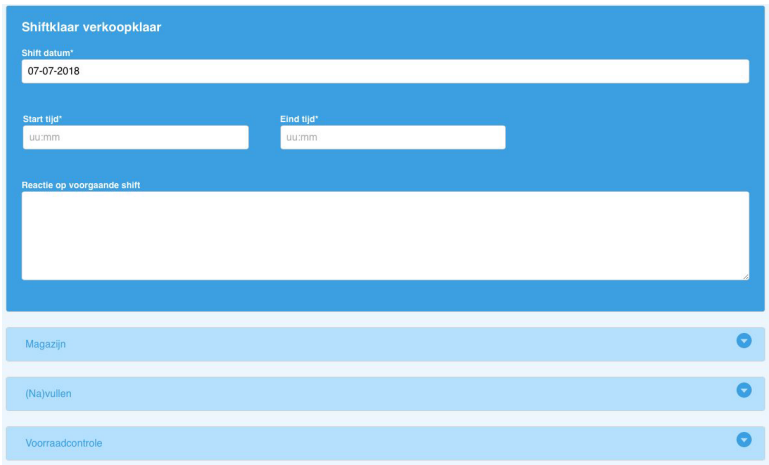

Figure 1. The outline of the shift report application. Information that needs to be registered are the date, start and end times of the shift, an evaluation of the previous shift, and details related to the stockroom, restocking, and inventory control.

4.1 Workaround patterns

During the second coding cycle, we grouped the identified workarounds into patterns. Patterns are generalized workarounds that cover two or more of our identified workarounds. Table 2 shows the patterns that we identified and the workarounds that belong to each one of them. Our running example, worka-

round W20, is linked to pattern P2: "Using other applications to overcome inadequate system functionality". The prescribed process is to write each shift report in the application on the online platform. Team managers, often in consultation with their manager, decide to write and share their shift reports in other manners. In the case of W20, this happens via Google Drive. This corresponds with a bypass from the prescribed process.

ID	Pattern title	Patter description	Workarounds IDs
P1	Using manual actions and bypasses to overcome inadequate system functionality	System failing or not sufficing, and thus manual action required.	W3, W8, W15, W18, W21, W23, W26, W27
P2	Using other applications to overcome inadequate system functionality	Prescribed applications do not suffice so other company applications are used.	W1, W2, W5, W6, W12, W13, W14, W17
P3	Using personal ICT to overcome inadequate system functionality	Prescribed applications do not suffice so personal (cloud) software and telephones are used.	W9, W19, W20, W22, W24, W28
P4	Using applications for alternative goals	Using applications for activities which are not prescribed.	W4, W7, W10, W11, W16, W25, W29

Table 2. Discovered patterns and the corresponding workarounds.

4.2 Workaround features and categories

The workarounds were each assessed on their 'features' and the particular 'category'. The features represent the duration, nature and motivation of the workarounds, based on the six "ideal types" as defined by Friedman et al. (2013). These types exist along three dimensions, i.e., temporary or routinised, unavoidable or avoidable, and unplanned or deliberate. Table 3 presents how the identified workarounds score on these dimensions.

In addition, we also analysed the identified workarounds according to the terminology defined by Ferneley and Sobreperez (2006). They define three 'categories' of workarounds in their study, i.e., essential, hindrance and harmless workarounds. Essential workarounds are necessary for completion and thus cannot be avoided during fulfilment of a task. Hindrance workarounds result in an easier or more efficient process or benefit other processes. Harmless workarounds have a similar effect as the prescribed way and have no impact on the process or the data captured in the process. The last column in Table 3 presents the classification of each workaround found for this case in the three corresponding categories, regardless of the features identified in the other columns.

As for our running example, W20 forms an example of a deliberate choice to bypass the platform. It is avoidable as well since there is an existing application for this task. In addition, these deviations happen systematically, i.e., every day, and therefore are routinised. As one of the team managers explains: "*Writing it in Google Drive is way clearer and everybody can respond to it. One can write what seems necessary to him or her. The [standard] application on the platform requires many superfluous steps; things that are actually standardised. I was aware of the existence though. We have just never used it.*" Another team manager explains: "*We do not write the reports in the manner that is expected from us. There is a really nice application for that purpose, which we do not use. It was a deliberate choice at that time and we never changed it back.*"

Concerning the categories of workarounds, W20 was classified as a hindrance one. As one team manager explains, she feels this workaround benefits other processes: "*Because we write it in Drive, we are automatically logged into our email accounts. Because of that, I read my emails every day. I probably would not do that if I didn't have to write the shift report. It's also really nice that all our communication is in one document. Every important thing is in there, you don't have to look anything up.*"

After both classifications were finalized, the features and categories per workaround were cross-referenced during our data analysis. This enabled us to look for relationships between workaround feature and

category. The results from Table 3 formed the basis of the cross-reference, which are summarized in Figure 2 through a bubble chart.

As shown in Figure 2, a number of relationships were found in this case study for each of the three workaround categories. Essential workarounds imply absolute inevitability and unplanned actions; in combination with routinisation, for half of them, or in combination with temporary actions for the other half of the essential workarounds. As for the hindrance workarounds, they imply absolute deliberateness and inevitability; with nine out of ten instances also entailing routinisation and only one entailing a temporary action. Harmless workarounds entail almost utter deliberateness and routinisation (12 out of 13 instances), of which one is avoidable and the other one is unavoidable; and only one of these 13 instances implies temporary and unplanned actions.

Workaround	Features						Category
	Temporary	Routinised	Unavoidable	Avoidable	Unplanned	Deliberate	
W01		X		X		X	Harmless
W02	X		X		X		Essential
W03		X	X		X		Essential
W04		X		X		X	Hindrance
W05		X	X		X		Essential
W06		X		X		X	Harmless
W07		X		X		X	Harmless
W08		X		X		X	Hindrance
W09		X		X		X	Harmless
W10	X			X		X	Hindrance
W11		X		X		X	Harmless
W12		X		X		X	Hindrance
W13		X		X		X	Harmless
W14		X		X		X	Hindrance
W15		X		X		X	Hindrance
W16		X		X		X	Harmless
W17		X		X		X	Hindrance
W18		X	X		X		Essential
W19		X		X		X	Harmless
W20		X		X		X	Hindrance
W21	X		X		X		Essential
W22		X		X		X	Hindrance
W23		X		X		X	Harmless
W24		X		X		X	Harmless
W25		X		X		X	Hindrance
W26		X		X		X	Harmless
W27	X		X		X		Essential
W28		X	X			X	Harmless
W29	X		X		X		Harmless

Table 3. Identified workarounds and their features and categories.

Through the graph presented in Figure 2, one can easily see that the vast majority of the workarounds (69%) are routine, avoidable, and deliberately planned; with about half of them classified as harmless (55%) and the other half as hindrance (45%), i.e., none of these are essential. Furthermore, there are three combinations of workaround features for which no workaround was found and hence no category relationship appears in the graph, which are: temporary, unavoidable and deliberate; temporary, avoidable and unplanned; and routinised, avoidable and unplanned.

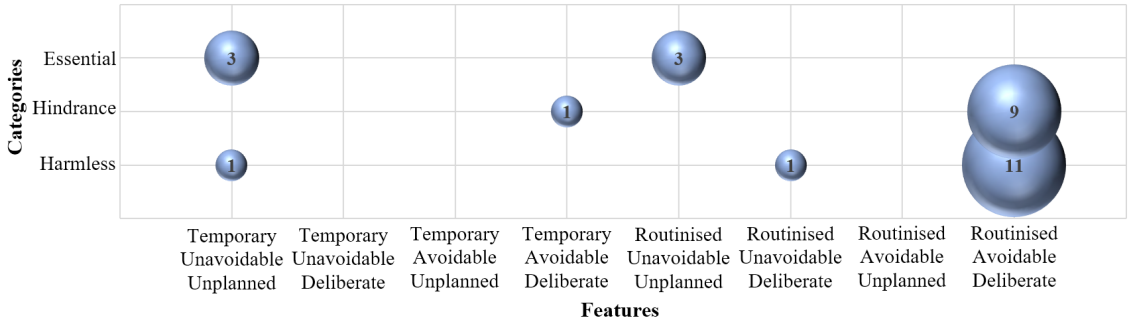

Figure 2. Cross-reference among workaround features and categories.

4.3 Response: Deciding which actions to take

For each of the workarounds that were pointed out during the interviews and observations, the team managers were also asked how the workaround could be resolved. Four possible response actions were discussed, as defined in the Workaround Action Matrix developed by Beerepoot and van de Weerd (2018), namely "prevent", "adopt", "redesign" and "ignore". Based on the analysis of the interviews, we assigned each workaround to one of the response actions; these actions represent the responses that were believed by the team managers to fit the workaround and the work system best. The four predefined actions, as well as their descriptions, are presented in Table 4 along with the workarounds for which each action has been chosen as the best response to them.

Action	Action description	Workarounds IDs
Prevent	Actively restrict the use of the workaround. Does not require process changes but takes high management effort.	W02
Adopt	Accept the workaround and actively propagate it.	W06, W08, W19, W20, W22, W24, W26
Redesign	Alter the work process. Requires process changes and high management effort.	W01, W03, W05, W10, W13, W15, W17, W18, W21, W27, W28
Ignore	Leave everything as it is. Does not require process changes, nor management effort.	W04, W07, W09, W11, W12, W14, W16, W23, W25, W29

Table 4. Actions proposed as responses for the identified workarounds.

Noteworthy is that in the case of the supermarket chain where the case study was conducted, "prevent", "adopt" and "ignore" actions can be executed locally, i.e., per store, in contrast with the "redesign" action, which has to be undertaken by the headquarters and implemented nationwide.

Figure 3 gives a visual representation of which type of workaround requires which action, i.e., this figure shows how the workaround features and categories relate to each other and then how different workaround categories indicate different action responses. In this figure, the width of the line connecting the elements represents the number of workarounds referenced by it, which indicates the 'strength' of such connection; i.e., the wider the line, the stronger the connection between a workaround feature and a workaround category or between a workaround category and a response proposed to a workaround. Connections referencing only one or two workarounds are represented by dotted lines.

In terms of proposed responses, the majority of the essential workarounds identified in this case study all ask for redesign of the task. Five out of six instances should be redesigned in particular. This is explicable as essential workarounds are necessary for task completion. Often, the process is slowed down significantly due to the workaround. Redesign should thus ensure a smoother and therefore faster execution of the task. The only essential workaround that should be prevented, according to some managers, was a workaround related to using the order application. Many team managers believe that before being able to place an order they have to retrieve product numbers from another application. In reality, they can use the order application for this, but few team managers know how to do this because this is not explained in the application's manual. A solution offered by one of the team managers was to explicitly include this in the manual to prevent the (less efficient) workaround from occurring.

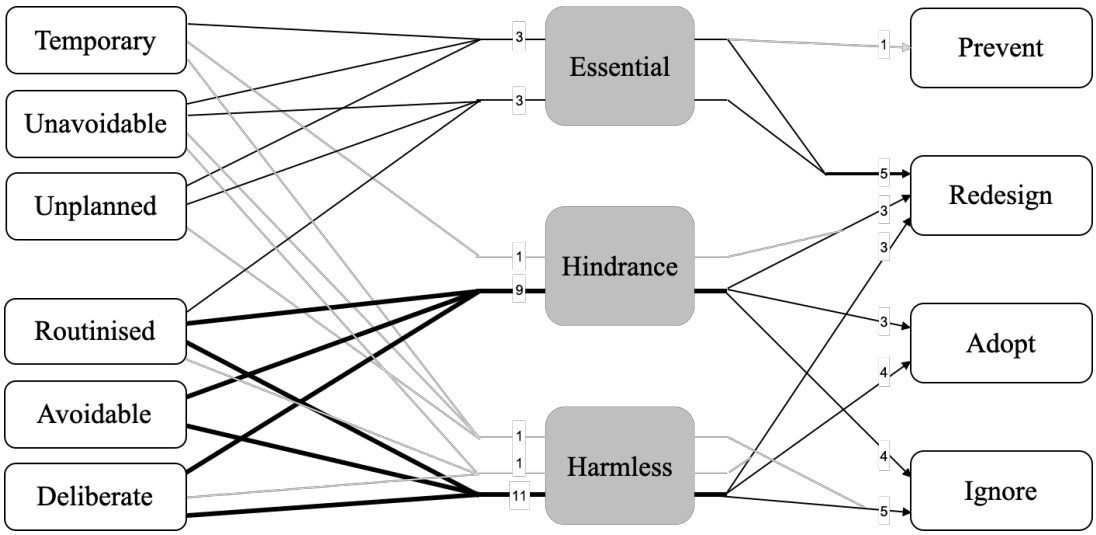

Figure 3. Overview of workaround features, categories and proposed response actions.

According to the team managers, hindrance workarounds should be ignored, redesigned or adopted. In this case, the response types are evenly distributed. Prevention of hindrance workarounds is not advised; the corresponding workaround always somehow benefits the process or other processes and does no harm. For example, the proposed response for W20 is adoption. Several team managers claim this workaround to be beneficial for other work processes. One of those team managers explains: "*I think this way of writing shift reports should be formalised. All information is in one place, you can mention the things that you ought important, you can adjust your own reports and see other reports any time. It makes people more involved and it adds to the group feeling.*" In this case, the process should change little, and management effort is not necessary.

Harmless workarounds should also be ignored, redesigned or adopted. Nearly half of the time, the workaround should be ignored. Redesign and adoption responses are evenly distributed. Prevention of harmless workarounds is also not advised; the workaround type has no negative consequences and reaches a similar result as the prescribed task.

5 Discussion

In an effort to explore the types of workarounds in the retail work system and the possibility to derive a conceptual framework of responses, we conducted a case study on the work system of a Dutch supermarket. The results included in the previous section presented three different classifications, i.e., features, categories and responses as well as outlined a conceptual framework. This section discusses the implications, explains the encountered limitations and give some directions for future research.

5.1 Theoretical and practical implications

The approach taken in this case study resulted in an extensive set of identified workarounds. Supermarket team managers from four stores reported that they deviated from the prescribed processes in 29 different ways. Our survey showed that all identified workarounds were recognised by team managers in other stores. This supports the assumption that the extensive standardisation of work processes in combination with the high diversity of demographics, hierarchies, employee skills, products and services, and employers in retail work (Grugulis and Bozkurt, 2011) may often result in working around the prescribed processes.

Each workaround was first assessed in terms of their features using the three-dimensional typology of Friedman et al. (2013). Most of the workarounds (69%) turned out to be routinised, avoidable, and deliberately planned, which entails that they have become part of the regular process, although team managers knew how to avoid them. The routinisation of workarounds is a well-described phenomenon. Gasser (1986) already argued that IS users "institute workarounds as locally appropriate solutions", and Zhou et al. (2011) found in their 18-months ethnographic study that workarounds can gradually become routinised. However, the many deliberately planned workarounds that we identified are in stark contrast with the findings of Friedman et al. (2013) who found that the majority of workarounds in a healthcare setting was unplanned. This might be caused by the different settings: working around official procedures in healthcare settings are often discouraged because that might have serious implications regarding patient safety and privacy. In the retail context of our case, implications are much less severe. Another reason could be found in the knowledge intensity of the different processes as has been explored by Unger et al. (2015).

Friedman et al. (2013) also discuss the co-occurrence of different workaround features. They found that most of the features could occur together, e.g. avoidable and unavoidable workarounds could both be routinised; routinised and temporary workarounds could both be deliberately chosen; and unplanned and deliberately chosen workarounds could both be temporary. This is confirmed in our study, where the three features that co-occurred the most frequently are routinised, avoidable and deliberately chosen.

In addition to the three-dimensional typology of features, we also used the workaround categories of Ferneley and Sobreperez (2006). 13 of our identified workarounds are harmless workarounds. In these cases, there is a continuation of work despite obstacles, as Alter (2014) describes as well. Furthermore, 10 hindrance workarounds were found in which team managers all showed willingness to innovate and improvise. This is in line with the work of Petrides et al. (2004), who even argue that people who use these workarounds are willing "to engage in such efforts without organizational support" and are therefore interesting employees to involve in "creating a more self-reflective culture". Finally, six situations were pointed out in which the team managers had no other choice but to work around in order to complete a task or process, i.e., essential workarounds.

The cross-reference of the two typologies showed that routinisation, avoidability and deliberateness are typical for harmless and hindrance workarounds. Unplanned and unavoidable workarounds were found to be essential workarounds. This is not surprising as essential workarounds are, although they deviate from prescribed procedures, seen as critical by their users (Ferneley and Sobreperez, 2006). An interesting result from the cross-reference is that there are three combinations of workaround features that cannot be linked to a particular category, namely: temporary, unavoidable and deliberate; temporary, avoidable and unplanned; and routinised, avoidable, and unplanned. This first combination is also confirmed by Friedman et al. (2013). They argue that when a workaround is caused by something external (unavoidable), "it is less likely to be strategically chosen by the practice" (deliberately planned). The other two combinations are the only ones that combine the features avoidable and unplanned, which mirrors the co-occurrence of unavoidable and deliberately planned that Friedman et al. discuss. In the same line of thought, one might argue that workarounds that are avoidable (caused by the users themselves) are less likely to be unplanned.

The response actions, as outlined by Beerepoot and van de Weerd (2018), were also assigned per workaround. Harmless and hindrance workarounds were mostly linked to redesign, ignoring or adoption.

Essential workarounds can be solved, or benefitted from, by redesigning the process. Prevention was only in one case the preferred option; meaning that all other workarounds either benefit the task or process, are needed for completion for the task or process, or have no harmful results. This adds to the belief that workarounds can be beneficial (Niazkhani et al., 2011; Tucker, 2009; Alter, 2014).

The proposed conceptual framework, as shown in Figure 3, gives a compact overview of the relationships between workaround features, categories and responses in this case study. As all typologies were applied separately, and the proposed response for each workaround was determined independent of its features and categories, the framework forms a basis on which responses can be determined, or at least be explored, in a structured manner. Context-specific classification schemes have been proposed earlier (Gasser, 1986; Ferneley and Sobreperez, 2006; Halbesleben et al., 2008; Ignatiadis and Nandhakumar, 2009), but this research contributes by linking the different typologies and response actions, which enables researchers to systematically study how workaround features, categories and response actions relate to each other.

This study has some practical implications as well. First, the results have shown that, despite the extensive standardisation of retail processes, different types of workarounds occur in the retail work system. Furthermore, our survey indicates that most of the identified workarounds were widespread in the organisation. Managers of retail facilities should realise this and act upon the matter. Second, our results show that for only one workaround the preferred response action was to prevent it. The others were all linked to redesign, ignore, or adopt responses. This shows that workarounds are mostly seen as improvements to the work system and can therefore play an important role in process improvement efforts. Finally, our proposed conceptual framework of responses can aid team managers in identifying workarounds and, based on their features and classification, determine the appropriate responses: prevent, adopt, or ignore the workaround, or redesign the work process. The proposed responses are predefined and tangible, and the majority can be executed rather easily on a local level.

5.2 Limitations and future work

The approach taken in this research does have some limitations. As a first limitation, the interviews and observations were performed in four stores. If we would interview more team managers, we would most likely find more workarounds. However, in order to increase the confidence of the obtained data, the final set of identified workarounds, as presented in Table 1, was distributed to team managers all over the Netherlands in the form of a survey which resulted in 292 responses. These findings confirmed the widespread use of the workarounds found in the interviews, with some more recognised than others, which can be explained because not all are applied to the context of all types of managers. Second, there is a shared belief that recognising and responding to workarounds can benefit process compliance and hence the work system; although the generalisation still needs to be verified to be confirmed. Third, the interviews and observations, as well as the first round of analysis were performed by one researcher; although the results of the survey confirmed the existence of all identified workarounds. Moreover, the proposition of the conceptual framework of responses was performed in conjunction with the other authors. Lastly, team managers were viewed as domain experts in this case study and all classifications were performed based on interviews with them only; however, although the team managers are the ones responsible for executing all in-store processes, the proposed responses might differ if the views of higher management levels or the system developers are considered.

This study presents a step towards awareness of workarounds and the opportunity to sketch the appropriate responses to them using a conceptual framework. There are three possibilities for further research. First, a verification of the proposed framework could be performed by applying it at a significant scale, and by including respondents of higher management levels. Second, the framework could be expanded upon or modified after studying other cases of retail businesses. Our results indicate that the types of workarounds found in this sector differ from the results reported in the healthcare sector, where most studies on workarounds have been conducted. In future work researchers may consider exploring these

differences. Future work might also investigate automatic detection and monitoring of workarounds, by following a process mining approach (van der Aalst, 2011).

6 Conclusion

This paper presented the results of a case study on identifying workarounds in ISs in a retail work system. We specifically explored how features and categories of workarounds are related to response actions. Our study revealed a list of 29 workarounds that were widely used in the organization. We characterised these workarounds by their features and categories, thereby answer the first research question. Furthermore, we developed a conceptual framework of workaround features, categories, and responses through cross-referencing the classifications and assigning actions as responses to each workaround. This formed the answer to the second research question.

Our study revealed that most of the identified workarounds in our case organization were characterized by three features: routinised, avoidable and deliberate. This is in stark contrast with the results of comparable studies in healthcare, where the majority of workarounds appeared to be unplanned (Friedman et al., 2013). Reasons for this might be differences in the criticality and knowledge-intensiveness of the processes involved, although further research is necessary to corroborate this.

Our results also showed that the different workaround categories (harmless, hindrance, and essential) were linked to different responses. Two findings that stood out most were that essential workarounds were linked to the redesign response in almost all cases, and prevention was viewed as the most appropriate response for only one case. This adds to the belief that workarounds do not necessarily have a negative impact but can be used to improve work systems. Our resulting framework could aid managers in decision making concerning workarounds and foster a more positive attitude towards workarounds.

Finally, no other research has investigated workarounds nor proposed such a similar framework for the retail sector. The results of this study invite future researchers to validate and/or expand the framework and conduct further research in this domain and other sectors, for which we believe the proposed conceptual framework is a starting point.

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