Why Managers Tolerate Workarounds – The Role of Information Systems

Completed Research Paper

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Abstract

Workarounds as deviations from defined routines in business processes challenge standardization and thus the performance improvements expected from information systems. Literature associates workarounds predominantly with performance losses. Only few studies report on performance improvements from workarounds. However, what characterizes situations in which managers tolerate workarounds to yield potential performance improvements? This study examines situations in which managers are able to decide whether to tolerate or to prohibit workarounds. We report on a multiple case study in two organizations and use existing research on workarounds to structure our analysis. Building on this, we show that expected efficiency gains, exposure to compliance risk and perceived process weakness have an effect on the willingness of management to tolerate workarounds. We develop a model that illustrates important aspects of situations that influence this willingness and outlines the role of information systems in understanding workarounds.

Keywords

Workaround, tolerance, routinization, standardization, management.

Introduction

An important reason for organization to implement information systems (IS) is to standardize business processes, which results in performance improvements (Bala and Venkatesh 2007; Münstermann et al. 2010; Stetten et al. 2008). Workarounds as deviations from defined routines in business processes challenge standardization and thus threaten the performance improvements from IS (Alter 2014; da Cunha and Carugati 2009; Ignatiadis and Nandhakumar 2009). Workarounds result in loss of control (Lapointe and Rivard 2005), reduced productivity (Bagayogo et al. 2013), and deviations from the intended business process purpose (Ciborra 2000). While this negative perspective on workarounds predominates literature, there are also studies that show positive aspects of tolerating workarounds (Alter 2014)

Several empirical studies outline benefits from tolerating workarounds on organizational performance. Miller and Wedell-Wedellsborg (2013) argue that radical innovations may need to violate existing organizational standards and processes in order to succeed. Huuskonen et al. (2013) show improvements in daily operations due to misaligned IS. McGann et al. (2008) report on the implementation of an information systems in a manufacturing plant and experienced workarounds as process improvements. Similar examples occur in public sector organizations as well (Campbell 2011).

Hence, managers respond differently to workarounds based on their situational context (Mainemelis 2010). Some workarounds are tolerated by management, others are prohibited. In three cases across

different industries, Pittenger et al. (2011) show that managers tolerate noncompliant behavior as long as organizational standards and processes are hindering employee value creation. In contrast, in a hospital, management enforces the standardized processes of IS in order to reduce medication errors (Yang et al. 2012). Other researchers report on challenges of workarounds that have different consequences within the same business processes and thus have to be treated differently (Ferneley and Sobreperez 2006; Györy et al. 2012).

In this context, it is unclear how managers decide on tolerating or prohibiting workarounds (da Cunha and Carugati 2009). While there are several promising theoretical models that encounter this issue, they lack empirical validation. Bagayogo et al. (2013) propose a model that combines acceptance and resistance with individual and organizational impacts. Similarly, Martin et al. (2013) suggest a theory of bureaucratic rule-breaking, but call for empirical research in understanding the role of workers, management, and external pressures. Building on creativity and deviance literature, Mainemelis (2010) suggests a model for ambivalent noncompliant behavior with uncertain consequences and suggests to explore the role of managers in treating these noncompliant behavior based on contextual and situational characteristics.

In this research, we examine managers' decision making in tolerating and prohibiting workarounds. We answer the research question of *which factors influence manager's decision on tolerating or prohibiting workarounds?* We conduct a multiple case study (Yin 2009) in two organizations and examine workarounds, which were not purely negative but also had positive consequences for the organization. We used a process theory (Alter 2014) that comprises a thorough review of the literature to structure our analysis and use analytical induction to uncover new constructs and relationships that enrich our understanding of managerial workaround decision making. By applying the managerial perspective on understanding workarounds in IS settings, we (1) develop a model to explain managers' willingness to tolerate workarounds, (2) show that workarounds have an ambivalent character which influences management decisions, and (3) show that IS are often used as 'scapegoat' when managers are brought to justice when tolerating workarounds.

We identified three types of factors - expected efficiency gains, exposure to compliance risk, and process weaknesses - that influence managers' willingness to tolerate workarounds. We add a distinction between employee and management perspective to the theory of workarounds (Alter 2014) by analyzing organizational risks and benefits as a basis for managerial decision making. We contribute to the existing body of knowledge on managerial workaround decision making by outlining the role of IS.
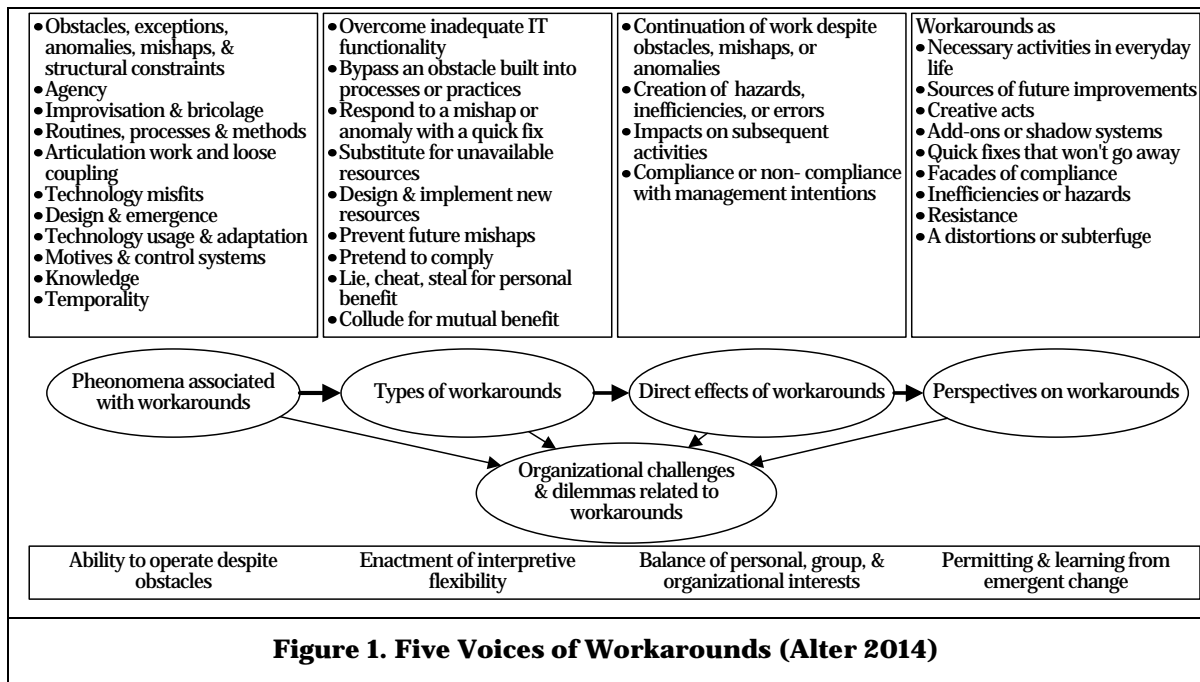
Theoretical Foundation

Early definitions coined workarounds as "misfits with the idealized representations of work" (Gerson and Star 1986) or as "nonstandard procedures operators devise to compensate for system deficiencies" (Courtright et al. 1988). Thus, workarounds have been studied mostly from an ex-post perspective as resistance to process design (Sobreperez et al. 2005), or improvisations in processes (da Cunha and Carugati 2009). More recent approaches define workarounds as goal-driven changes to defined routines in business processes (Alter 2014). The basic assumption in literature is that employees generally tend to resist because of conflicting goals (Ignatiadis and Nandhakumar 2009). Researchers suggest primarily organizational factors that contribute to this resistance such as lack of accountability, drift, and loss of control (Azad and King 2012; Jenkins and Durcikova 2013).

Additionally, the increasing ubiquity of IS in business processes aggravates the opportunities for workarounds. Employees engage in workarounds to cope with a perceived poor fit of technology and process (Safadi and Faraj 2010). IS also create an illusion-of-control risk, that is, the information provided by an IS may not reflect the actual process instantiation. (Sobreperez et al. 2005). Similarly, employees exploit IS to build 'facades of compliance', which means that employees use IS in order to feign compliance (da Cunha and Carugati 2009).

Alter (2014) is one of the first to suggest a comprehensive theory of workarounds that structures existing research on workarounds. Workarounds emerge either from obstacles to getting the work done or from goal misalignment of stakeholders. Alter (2014) develops five 'voices' of workarounds to structure phenomena associated with workarounds, types of workaround, direct effects of workarounds, different perspectives on workarounds, and subsequent organizational challenges and dilemmas related to

workarounds (see figure 1). Those different dimensions integrate extant research on the consequences of workarounds (Ferneley and Sobreperez 2006; Martin et al. 2013).

| Obstacles, exceptions, anomalies, mishaps, & structural constraints
• Agency
• Improvisation & bricolage
• Routines, processes & methods
• Articulation work and loose coupling
• Technology misfits
• Design & emergence
• Technology usage & adaptation
• Motives & control systems
• Knowledge
• Temporality | • Overcome inadequate IT functionality
• Bypass an obstacle built into processes or practices
• Respond to a mishap or anomaly with a quick fix
• Substitute for unavailable resources
• Design & implement new resources
• Prevent future mishaps
• Pretend to comply
• Lie, cheat, steal for personal benefit
• Collude for mutual benefit | • Continuation of work despite obstacles, mishaps, or anomalies
• Creation of hazards, inefficiencies, or errors
• Impacts on subsequent activities
• Compliance or non- compliance with management intentions | Workarounds as
• Necessary activities in everyday life
• Sources of future improvements
• Creative acts
• Add-ons or shadow systems
• Quick fixes that won't go away
• Facades of compliance
• Inefficiencies or hazards
• Resistance
• A distortions or subterfuge |

Pheonomena associated with workarounds → Types of workarounds → Direct effects of workarounds → Perspectives on workarounds

Organizational challenges & dilemmas related to workarounds

| Ability to operate despite obstacles | Enactment of interpretive flexibility | Balance of personal, group, & organizational interests | Permitting & learning from emergent change |

Figure 1. Five Voices of Workarounds (Alter 2014)

The 'phenomena' voice covers the range of antecedents of workarounds. The 'types' voice provides a classification scheme for workaround based on the operational objective affected by the workaround. The 'direct effect' voice structures consequences and implications of workarounds. The 'perspectives' voice structures the management perspective on workarounds. Finally, the 'organizational challenge and dilemmas' voice structures challenges that arise from workarounds.

While Alter's (2014) theory provides a useful skeleton for investigating workarounds, there are several shortcomings in research on workarounds that remain unresolved: (1) we lack an understanding of how managers decide to tolerate or prohibit workarounds. Understanding this phenomenon is a prerequisite for more effective organizational routines (Tucker and Edmondson 2003). (2) While the majority of studies examine workarounds from an employee perspective (Ignatiadis and Nandhakumar 2009), several studies outline the need of applying a managerial perspective. (3) Bagayogo et al. (2013) outline the challenge of misaligned business processes and IS. They find that noncompliant resistance such as workarounds may not only have negative consequences, but may even be beneficial. However, the authors do not examine how managers treat workarounds. Building on creativity and deviance literature, Mainemelis (2010) suggest a model for ambivalent noncompliant behavior with uncertain consequences and suggests to explore the role of managers in treating these noncompliant behavior based on contextual and situational characteristics. Similarly, Martin et al (2013) suggest a theory of bureaucratic rule-breaking, but (4) call for empirical research in understanding the role of workers, management, and external pressures. Finally (5), we lack an understanding of the role of IS in managing workarounds (Ferneley and Sobreperez 2006). Investigating the role of IS in workarounds will help to establish design principles that help to design them more effective.

Research Methodology

In this study we used a multiple case design (Yin 2009), which we considered to be more likely to yield a generalizable, robust, and parsimonious understanding of workarounds. We used Alter's (2014) theory as framework to structure our analysis and additionally explored managerial workaround decision making using grounded theory techniques (Strauss and Corbin 1998).

Study Design

We selected diverse cases that differ in terms of domain, regulatory density, routinization, process maturity, and rule breaking culture (Alter 2014; Martin et al. 2013). When crafting our instruments and protocols, we triangulated perspectives on workarounds, including management, employee and IT, and compared multiple sources of data. The most important data sources however were semi-structured interviews (da Cunha and Carugati 2009). In each case, we approached key stakeholders for the workaround topic and followed a snowballing logic to identify further interview partners. In the analysis phase, we used Alter's theory (2014) to guide our within case analysis. We identified similarities and differences in the cross-case analysis.

We selected two cases for our sample (see table 1). As one of the most studied examples for a domain with flourishing workarounds, we found health care (case 1) to be particularly suitable to start our analysis as physicians talk rather frankly about how they interfere with organizational processes and work around IS (Safadi and Faraj 2010). In the second case we studied a supply chain from two perspectives, namely the manufacturer and consulting perspective. Employees are challenged to provide and manage the needed information among suppliers. Overall, we conducted 22 interviews and tape-recorded, anonymized, and transcribed them in 231 pages of text (see table 1).

	Case 1	Case 2
Domain	Health Care	Supply Chain
Description	Common security issues in the health care sector are privacy breaches, especially within information systems.	The reliability on supplier information is essential in supply chain management.
Interviews	10	12
Sample	Junior (5) and senior (3) physicians, security officer (1), IT director (1)	Management Consultants (7) and Retailers (5)
Average Time	54,64 min	61,28 min
Average Job Experience	12,82 years	8,45 years

Table 1. Case Overview

Following recommendations for multiple case studies (Yin 2009), we used the existing theory of workarounds (Alter 2014) for the confirmatory analysis and focused on the managerial perspective on workarounds in the exploratory analysis. We wrote individual case write-ups that triangulated all data and used Alter's five voices (2014) as coding scheme for the interviews. In each case, we identified workarounds and coded each characteristic with the corresponding voice. Our analysis involved 152 codes in total, on average 7,5 codes per workaround in case 1, and 4,8 codes per workaround in case 2. We applied the guidelines of open coding and identified factors related to managerial workaround decision making without forcing existing concepts from the literature onto the data (Strauss and Corbin 1998).

Results

Workarounds in Health Care

In the context of health care, we examined how physicians in hospitals use information systems. The first workaround – *download patient record* - we observed involved physicians who copy patient records from the secure information system onto private storage systems. The hospital implemented an information system in order to store and process all patient records. Physicians do not need to download any confidential information from the system. However, physicians copy patient records onto USB sticks or send it via e-mail. They send records to colleagues to ask for their opinion or take the patient record home for further investigation. The second workaround – *maintain standard password* – refers to a standard password that allows users access to all functions and data. The standard password was intended for emergency situations, but is often also used when physicians do not have access to certain functions, when employees work on different wards or when interns are trained in a ward. Besides, this workaround includes the fact that physicians do not change their initial standard password.

Domain	Work-around	Description	Five Voices				
			Phenomena	Type	Effect	Perspective	Org. Challenge
Health Care	Download patient record	Physicians copy patient data via USB from the secure information system	sensitive patient data gets distributed / technology usage and adaptation	physicians download data form system / bypass an obstacle	patient sensitive data distributable / non-compliance with management intentions	process hinders daily work / inefficiencies or hazards	create awareness among physicians / enactment of interpretive flexibility
Health Care	Maintain standard password	All employees in ward use standard password	standard password for emergency situations / temporality	possibility to use stationary password is used in general / bypass an obstacle	prohibit data access documentation / non-compliance with management intentions	option to ease daily tasks / inefficiencies or hazards	definition of exceptional cases / balance of personal, group, and organizational interests
Supply Chain	Orders based on unofficial forecasts	retailer use own data for forecasts because supplied data is of bad quality and lack transparency	mistrust existing forecasts / knowledge	replace official data with own / bypass an obstacle	improve overall predictions for this supplier / impacts on subsequent activities	counterbalance deviations in demands / future improvements	increase transparency of forecasting / permitting and learning from emergent change
Supply Chain	Spreadsheet-based product data management	fashion companies use hands-on solution to collect supplier information by sending excel sheet	high effort to maintain supplier information / obstacles, exceptions, anomalies, mishaps, and structural constraints	complex tool to maintain supplier information / overcome inadequate IT functionality	tool to maintain supplier information is not used but excel sheet / continuation of work despite obstacles, mishaps, or anomalies	lower effort to maintain supplier information / facades of compliance	reduce complexity to increase information traceability / balance of interests

Table 2. **Categorization of Workarounds**

For each workaround, we identified the five voices to better understand what constitutes the workaround. Table 2 provides an example of how we mapped the concepts to the interview data in the case of our hospital case. We focus on one workaround as representation for the health case and chose *download patient record*. We coded the fact that sensitive patient data is distributed with the 'technology usage and adoption' characteristic because we found differences between the intended and actual use of technology. We identified the voice type of workaround as 'bypassing an obstacle' when physicians download information from the system via USB port and thereby bypass organizational guidelines The voice effect of the workaround was 'non-compliance with management intentions' as patient sensitive data gets distributable. The perspective voice was considered as 'inefficiencies or hazards' because it hinders physician in their daily work. Finally, the organizational challenge voice is 'enactment of interpretative flexibility' and lies in creating awareness among physicians.

Workarounds in Supply Chain

The first workaround we could identify – *orders based on unofficial forecasts* – deals with retailers who use their own data to undertake forecasting statistics due to bad quality of supplier data. By doing so, retailers expect more accurate calculations as suppliers often disguise their forecast in favor of their own distribution. They can increase the accuracy of their predictions by using their own data. We found that the decision whether the provided forecast is used, depends on the relative importance of the customer in the overall supplier portfolio. As second workaround – *spreadsheet-based product data management* – we identified the fact that a hands-on solution is used to collect supplier information. The fashion companies send an excel sheet to the suppliers with request for completing it and therefore source their own work out. The fashion companies switch to excel sheets when collecting information regarding product descriptions, product numbers, etc. Furthermore they request for further information, as the standard tool does not include all the necessary information.

Again in this case, we identified the five voices (table 2) to structure the workarounds and discuss one of them. The phenomenon associated with *orders based on unofficial forecasts* was coded as 'knowledge'. Employees use their own experience to propose forecasts as they mistrust the supplied ones. The type 'bypass an obstacle' has been used and 'overcome inadequate IT functionality'. We did so because the employees perceive the poor forecast as an obstacle in doing their work properly. We linked the voice direct effect to 'impacts on subsequent activities', thus it can result in improvement of the overall predictions. The perspective voice 'future improvement' has been linked to this workaround. The modification of the forecasts enables a more precise production and results in improvement. 'Permitting and learning from emergent change' is linked to the organizational challenge voice. This means that the forecast calculation is more accurate and transparent for the company because of their mistrust in others.

Cross-case Analysis

We compared our cases to identify similarities and differences. While the found workarounds differed in characteristics such as phenomenon or organizational challenge, all of them have in common that they have antagonistic consequences. That means that they are associated with organizational risks and organizational benefits simultaneously (table 3). In the health care case, the physicians downloading patients' records may lose these, which will result in privacy loss. On the other hand, the organization benefits from the physicians taking work home as more work can be done. Similarly, in the supply chain case, the orders that are based on unofficial forecasts may lead to economic loss due to misaligned orders. However, the organization may benefit from better forecasts as they capture the experience of the buyer in forecasting.

Case	Workaround	Organizational risk	Organizational benefit	Ambivalent managerial handling of workarounds
Health Care	Download patient record	Privacy loss due to leaked patient records	More work done by physicians by taking work home	Despite available and implemented technology, USB ports not fully deactivated
	Maintain standard password	Loss of segregation of duty	Integrating distributed information due to shift work and mobile work assignments	Despite hospital wide policies, physicians and nurses can still keep the initial password
Supply	Orders based on unofficial forecasts	Economic loss due to misaligned orders	Capture the experience of the buyer in forecasting	Despite official forecasts, employees order based on their own analysis
	Spreadsheet-based product data management	Inconsistency and inaccuracy of information in information system	Capture the variety of different product categories	Despite standard information systems, employees use flexibility of spreadsheets

Table 3. Ambivalent Aspects of Workarounds

Across all cases, we observed what we refer to as ambivalence (table 3). In all four workarounds, management is able to implement certain measures that effectively prohibit the workaround from happening. In the hospital, technology exists to entirely deactivate the USB port. When all USB ports were deactivated, no downloading of the patient data would be possible. In addition, firewall settings could easily be changed to prohibit email being sent to outside the hospital. Similarly, in the supply chain case, the official forecast could be obligatory for placing orders. The IS for placing orders could even automatically draw its forecast data from the official forecast sources.

Upon further examination of this ambivalence, we found factors influencing management's decision to implement measures that would fully prohibit the workaround from happening. We found factors that induce management to tolerate workarounds (table 4). We grouped them under the label of expected efficiency gain factors. We also found factors that influence management to refrain from tolerating workarounds (table 5). We grouped them under the label of exposure to compliance risk factors. Finally, we found factors that influence the effect of the compliance risk on management's willingness to tolerate workarounds. We grouped these documentation related factors under the label of perceived process weakness factors.

Factor	Description	Effect on managerial willingness to tolerate workaround
Increased process quality	„Basic product master data of a product that is normally defined by the manufacturer and again how does this data then get from the manufacturer to the supplier in a proper format? So the reseller basically gets data from many different manufacturers to automatically align with the master data system."	+
Shortcuts	„Because we have many PJs, meaning students that help in the ward for a time, they don't get passwords of course. However they are there to make your work easier. So for quickly printing some data or occasionally writing a letter, they have our passwords. The nurses have them as well."	+
Work life balance	„If I walk into a hospital and tell them I don't want the USB ports to be accessible anymore, the senior physician that I've known for 20 years tells me: 'You're forcing me to write my scientific reports, my presentations, etc. here at the hospital. Then I won't see my family at all'."	+
Improved process throughput time	„Here however, if the administrators create a password in the beginning if your name is Anton Smith then the login is Smith and the password Anton. And you can change it yourself afterwards but many colleagues simply keep it because the time savings are bigger [than security threats] at that time."	+
Supply chain visibility	„I think it's more about high volume information and similar topics, where perhaps there is more transparency at one supplier than at others."	+

Table 4. Expected Efficiency Gains Increase Managerial Willingness to Tolerate Workaround

The expected efficiency gain factors induce management to tolerate workarounds. We found that the spreadsheet-based approach to product data management increases product meta-data and thus improves process quality when the data set did not comprise more information than the employees could manage. This factor has a positive effect on management's willingness to tolerate workarounds. Maintaining standard passwords in the hospital allows nurses or students to help physicians with bureaucratic tasks and thus provide shortcuts to existing processes. The shortcut factor has a positive effect on management's willingness to tolerate workarounds. Further factors include work life balance, improved process throughput times, and supply chain visibility (table 4).

Factor	Description	Effect on managerial willingness to tolerate workaround
VIP patients	„Also at the university hospital, it can of course happen that you get a special person and those are then encrypted. They'll set a so-called VIP indicator during admission and then you can't see who it is any more. That's for Michael Schumacher and similar people.	-
Deviations in revenue	„Of course that reaches the end customer a lot faster today (...) Of course that has a direct influence on retail figures, meaning sales figures, because I mean, you could see that with <retail company I with scandal in the past>, with <retail company II with scandal in the past>, wherever there was a scandal sales collapsed and I think that's just something manufacturers in the retails sector have to deal with."	-
Legal consequences	„So formally the employee that misused his user rights has to have a hearing with HR because there's the suspicion that he acted against his employment contract. Privacy laws as well as criminal laws have the offense of disallowed access of data if data is secured by a password or locked. So it's not even necessary that someone passes information along, even disallowed reading is relevant already."	-
Life-critical treatment	„That can end in catastrophe very quickly because in the outpatient department you're responsible for many areas not only the ER but also the ward. And sometimes you simply need quick access to everything."	-

Table 5. Exposure to Compliance Risk Reduces the Managerial Willingness to Tolerate Workaround

The exposure to compliance risk factors influence management to refrain from tolerating workarounds. In the hospital, the fact that a well-known person is treated in the hospital reduces management's tolerance of workarounds. We found that when VIP patients are treated in hospitals, the consequences from privacy losses are unreasonably higher than from regular patients. Thus, management is not willing to tolerate workarounds when VIP patients are involved. In the supply chain case, we found that Orders with imprecise forecasts quickly affect organizational revenue. Thus, management is not willing to tolerate individual forecast predictions. Further exposure to compliance risk factors includes ensuring quality standards, legal consequences, access monitoring, punishment, and life-critical treatment (table 5).

The perceived process weakness factors influence the effect of the exposure to compliance risks on management's willingness to tolerate workarounds. We found perceived weaknesses in business processes that allow the workaround to happen. In the hospital, the process of documenting patients' data in an electronic file in the hospital information system has the weakness of allowing employees to download data to portable devices. Thus, they can download files from the system. In the supply chain case, the purchasing department uses official forecasting data for placing purchase orders. However, the purchase order is filled manually by the employees. In all four workarounds, we found that information systems do not properly implement the intended business process. The resulting perceived process weaknesses allow physicians in the hospital case to take patient records home. In the supply chain case, employees can use their own forecast data for placing purchase orders.

Factor	Description	Effect on managerial willingness to tolerate workaround
USB Port	„That's a very difficult area of tension. And you can't ban the chief of medicine or his secretary from using this USB port, that's the way things are. He's his own data's boss. I don't have the authority to interfere, we are batting down the hatches here."	
Standard password	„You have to understand, the patient comes into the introduction, a relatively critical phase. And then the anesthesiologist has to put something into the PC as well. But he has to look after the patient too. Then he passes through all the different locks and has to use the PC again and again and would have to log in every time as well. That takes way too much time."	moderates relationship with 'Exposure to compliance risk'
xls-sheet	„That's more of a hands-on solution using spreadsheets where you say, ok we want the manufactory information in there, please."	
Unreliable forecast reports	„So if you were the buyer here, and you wanted to offer the supplier a better forecast, give them a better forecast, but you were only 40% of their business. So, let's now say it's 1,500. Actually it should have been 4,800. But these went up to 2,500; these went up 1,500. The supplier then still has to bring in more stock, or use some of these stocks. So how would you get the benefit of a better forecast here? How do you contribute the benefit of this number to the supplier when their supply has gone out and you're only 40% of their business?"	

Table 6. Perceived Process Weaknesses Promote the Managerial Willingness to Tolerate Workaround

Discussion

In this research, we used Alter's theory (2014) to study workarounds in a health care organization and a supply chain management organization. While it is useful for understanding the complex structure of workarounds, our study established a distinct managerial perspective on workarounds (Mainemelis 2010; Martin et al. 2013). We found that an organizational risk benefit analysis influences the willingness to tolerate workarounds from a management perspective (Figure 2). We showed that information systems play an important role in this setting, as they standardize routines and increase accountability. Our results suggest that workarounds should be interpreted not only in terms of compliance but also in terms of performance improvements (Campbell 2012; Pittenger et al. 2011). The tendency to tolerate workarounds rises if, e.g. they better fit employees' task environment (Huuskonen and Vakkari 2013). This perspective finds support in seeing workarounds as opportunity to take the initiative to develop or deploy creative tactics and anticipate barriers (Pittenger et al. 2011). In our supply chain case the fact that the quality of supplier information can be improved by handing over this process to them is an example for gaining efficiency. We thus propose:

> P1: Expected efficiency gains have a positive effect on a manager's willingness to tolerate workarounds.

We argue that management chooses process alternatives in order to yield expected efficiency gains from the workaround while limiting exposure to compliance risks (da Cunha and Carugati 2009). In literature, we found several cases in which compliance had somehow an effect on the execution of workarounds

(Ferneley and Sobreperez 2006). Employees who conformed to sets of systemic rational-legal rules are rewarded, whereas non-conformity is punished. As shown in our case study, management is aware of physicians executing workarounds and monitors data access in health care. This argument leads to the proposition that:

> P2: Exposures to compliance risks have a negative effect on a manager's willingness to tolerate workarounds.

Our study established perceived process weaknesses as an important aspect of understanding workarounds. In our cases, managers would have been able to prohibit workarounds, for example by deactivating USB ports or preventing standard passwords. However, managers chose not to exercise such options (Martin et al. 2013). Instead, managers develop complex explanations of why they chose to tolerate workarounds. In line with research we argue that often IS are blamed when the final outcome is not what was expected (Campbell 2012). Humans blame IS for errors, process deviations, or inferior process quality (Bates et al. 2001; Koppel et al. 2008; Markus and Keil 1994). In particular, managers blame technical shortcomings, security restrictions and low responsiveness in the IT department when tolerating workarounds. This argument suggests that:

> P3: Perceived process weaknesses mediate the effect of exposure to compliance risks on a manager's willingness to tolerate workarounds.

We contribute to the body of knowledge by establishing a first understanding of the role of IS in the emergence of workarounds. We show that perceived process weaknesses caused by IS create situations of deniability that increase managers' interpretive flexibility (Sobreperez et al. 2005). Literature characterizes IS as vehicles to forfeiting surveillance (da Cunha and Carugati 2009). In contrast, our study shows that IS also serve as a 'scapegoat' for managers that tolerate workarounds.

We contribute to a more nuanced understanding of why managers tolerate workarounds. Our analysis suggests that workarounds have ambivalent consequences from a managerial perspective: expected efficiency gains compete with exposure to compliance risks. We thus propose that the factors that contribute to expected efficiency gains increase managerial willingness to tolerate workarounds while the exposure to compliance risks reduce managerial willingness to tolerate workarounds. Perceived process weaknesses, however, moderate the relationship of compliance risks and managerial willingness to tolerate workarounds. Figure 2 provides an overview of the suggested research model.

Figure 2. A Model of Managerial Willingness to Tolerate Workarounds
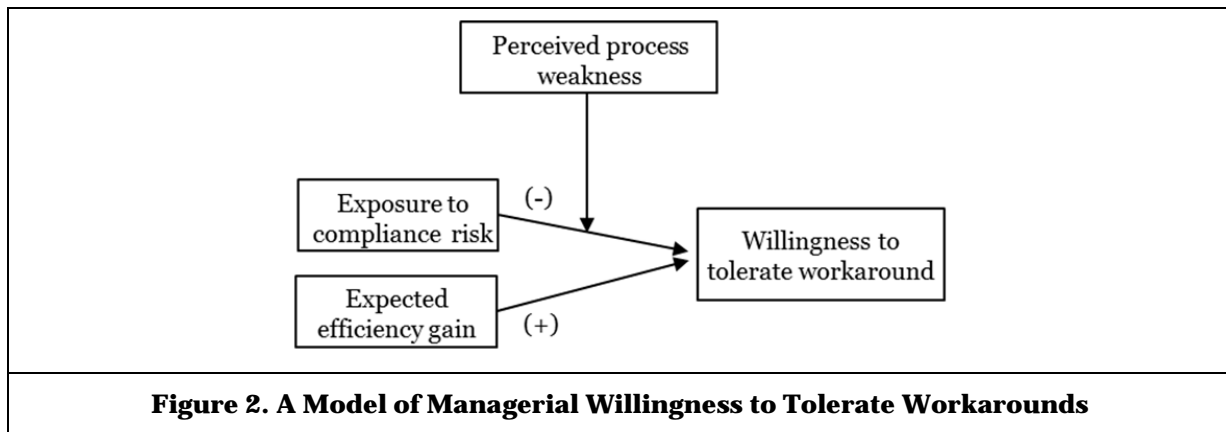
We acknowledge several limitations to our study. Our study is based on only 22 interviews in two organizations. Given the exploratory nature of the study, this research presents only a first step toward understanding manager's handling of workarounds. Further research should examine workarounds that do not violate policies and thus could easier be seen as a source of improvement. Furthermore, this research has a static perspective on business processes. Applying a dynamic perspective on business processes would highlight the evolution of tolerated behavior into workarounds when policies or systems change. While Alter's theory of workaround is useful in structuring workarounds, future research might

study workarounds from a bureaucratic perspective to establish a dynamic understanding of workarounds (Gouldner 1954; Martin et al. 2013).

Conclusion

This study advances our knowledge of workarounds in several ways. First, we document the usefulness of Alter's theory of workarounds (2014) for structuring and understanding workarounds. Second, we show that workarounds have an ambivalent character, challenging management in deciding whether to tolerate or prohibit the workaround. Third, using IS as a 'scapegoat' makes management decision deniable. Our study also extends Alter's theory of workarounds (2014). We provide a model of managerial willingness to tolerate workarounds and derive three factors from our cases that influence this willingness. Expected efficiency gains increase management's willingness to tolerate workarounds while exposures to compliance risks reduce management's willingness to tolerate workarounds. More importantly, we show that perceived process weaknesses caused by IS facilitate workarounds. Those process weaknesses add the factor of deniability and enable managers to place emphasis on the expected efficiency gains. In this way, IS serve as 'scapegoats', as managers can blame the IS for not preventing workarounds. Our analysis highlights the role of IS in the emergence of workarounds in modern IT-enabled organizations.

Acknowledgement

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