

Factors Leading to Business Process Noncompliance and its Positive and Negative Effects: Empirical Insights from a Case Study

Full paper

Ermeson Andrade

Federal Rural University of Pernambuco
ermeson.andrade@ufrpe.br

Han van der Aa

VU University Amsterdam
j.h.vander.aa@vu.nl

Henrik Leopold

VU University Amsterdam
h.leopold@vu.nl

Steven Alter

University of San Francisco
alter@usfca.edu

Hajo A. Reijers

VU University Amsterdam
h.a.reijers@vu.nl

Abstract

Many organizations face noncompliance in their business processes. Such noncompliant behavior can range from well-intended actions to the deliberate omission of essential tasks. The current view on noncompliance is mostly negative and many researchers discuss how to avoid it altogether. A gap in the research is a lack of empirical insights on when noncompliance has positive and when it has negative effects. Against this background, we conduct a qualitative study in the customer service department of a company hosting one of Europe's leading online project platforms. Differing from previous studies on business process noncompliance, the starting point of our study is direct observations of how employees conduct their work. We found that noncompliant behavior with a positive intention had a mostly positive effect on business process outcomes. Unintended factors of noncompliance, such as a lack of knowledge or carelessness, caused the most severe negative impact on business process outcomes.

Keywords

Business Process Noncompliance, Noncompliant Behavior, Process Outcomes

Introduction

Deviations from prescribed work practices are part of the reality of many organizations (Lalley and Malloch 2010; Röder et al. 2014b). Noncompliant behavior manifests itself in many diverse ways, ranging from well-intended actions to help out customers (Alter 2014) to the unthoughtful and accidental omission of essential tasks (Unger et al. 2015).

Most researchers express negative views on noncompliant behavior and many researchers have defined strategies to avoid it. Most notably, a wide range of technical solutions are available that aim at preventing and detecting noncompliant behavior (Outmazgin and Soffer 2013; Türetken et al. 2011). Examples of detrimental effects of business process noncompliance include a loss of control over business processes (Sadiq et al. 2007), reduced productivity (Bagayogo et al. 2013), or even financial penalties imposed by authorities (Lu et al. 2008). On the other hand, both theoretical work and other examples suggest that noncompliance can also have positive effects (Alter 2015), for instance, on process execution times (Ferney and Sobreperez 2006). A related gap in the research is the lack of empirical insights on when noncompliance has positive effects and when it has negative effects. Against this background, this paper

aims to answer the following research question: *What factors trigger process noncompliance and what are its positive and negative effects on business process outcomes?*

To answer this question, we conduct a qualitative study in the customer service department of an IT company hosting one of Europe's leading online project platforms. Differing from previous studies on business process noncompliance that built on after-the-fact interviews (Outmazgin 2012; Röder et al. 2014a; Röder et al. 2014b; Wiesche et al. 2013), the starting point of our study is direct observations of how employees conduct their work. We found that noncompliant behavior can be classified as intended and unintended business process noncompliance. Intended noncompliance, that is, deliberate deviations from prescribed work practices, may have positive or negative effects. We found that noncompliant behavior with a positive intention, such as the desire to prevent future mishaps, had a mostly positive effect on business process outcomes. In some cases, such positive noncompliant behavior even included innovative strategies to solve unforeseen problems. Unintended noncompliance occurs by accident or through a lack of necessary knowledge. A quite unexpected finding was that such unintended noncompliance accounted for the cases with the most severe negative impact on process outcomes.

The remainder of the paper is structured as follows. We first discuss the theoretical foundations of business process noncompliance. We then elaborate on our research methodology, including the context of our case study and the data collection procedure. In the findings section, we describe the business processes we identified, the factors triggering noncompliant behavior, and the effects of this behavior on business process outcomes. In the discussion, we reflect on the implications of our work for research and practice. The conclusion summarizes our results and reflects on limitations of our approach.

Business Process Noncompliance

The term *business process* refers to any collection of inter-related activities that lead to a valuable outcome for the customer of an organization (Dumas et al. 2013). Examples of business processes range from customer relationship processes to production processes. What most business processes have in common, is that it is possible to specify their essential activities and the order in which the activities should be executed. In practice, this is typically accomplished using business process models (Rosemann 2006). In contexts where such a specification guides the work of employees, *noncompliance* refers to any behavior that does not conform with this specification (Alter 2015).

Noncompliant behavior can manifest itself in different manners, such as skipping activities, performing additional activities, or performing activities without proper authorization. These acts can occur for various reasons. Brander et al. (2011) conclude that gaps between process specifications and practical requirements are inevitable and noncompliant behavior occurs to bridge this gap. Melão and Pidd (2000) recognize that process participants work under environmental constraints. The social interaction fosters debates and collaboration and, thus, deviations from intended structures need to be expected. While noncompliance can occur for a broad variety of reasons, an important distinction should be made between intended and unintended acts of noncompliance. Intended noncompliance, often in the form of *workarounds*, receives considerable attention in literature, cf. (Alter 2014; Halbesleben et al. 2010; Koopman and Hoffman 2003; Lalley and Malloch 2010; Röder et al. 2014a). The *theory of workarounds* proposed by (Alter 2014) describes how a variety of factors lead to the consideration and development of workarounds. Typical goals of workarounds include overcoming inadequate IT functionality or other obstacles and preventing future mishaps. There are also malicious workarounds in the form of lying, cheating, and stealing for personal benefit. Unintended acts of noncompliance receive considerably less attention in existing literature. This unintended behavior occurs in the form of mistakes and often due to a lack of knowledge about procedures (Alter 2015).

Noncompliance can have positive as well as negative effects on organizations, as recognized in literature, cf. (Alter 2015; Regev et al. 2007; Reichert and Weber 2012; Soffer 2005). Because the interests and goals of stakeholders involved in a process often differ, a single act of noncompliance might be beneficial to some and detrimental to others (Alter 2015). This follows from the fact that acts of noncompliance typically affect different performance dimensions. For example, noncompliant behavior can simultaneously have a positive result on the quality of a provided service, but a negative effect on the service time. These tradeoffs between effects on different performance dimensions play an important role in the causes and impact of noncompliance. Employees calculate potential benefits of noncompliance by

weighing the positive and negative effects (Röder et al. 2014a). When employees are not knowledgeable about the full effects of their actions, this can impede their ability to determine whether an act of noncompliance is beneficial or not. Despite the aforementioned works that consider the effects of noncompliance, no research that we are aware of has investigated both factors leading to noncompliance and the positive or negative effects on business process outcomes. This paper's goal is to address this gap.

Research Methodology

To answer our research question, we conducted an exploratory case study (Yin 2013). In the context of this case study, we performed direct observations, conducted semi-structured interviews, and studied secondary data such as notes and work descriptions. In this way, we were able to gain deep insights into the daily activities of the employees, the motives and intentions behind their behavior, and the (perceived) effects of noncompliant behavior on the organization. The following subsections introduce the details of our case study and discuss the data collection procedure.

Case Study Context

As the subject for our case study, we chose a German IT company hosting one of Europe's leading online project platforms. The company was founded in 2009 and currently employs over 30 people from various nations. The key business of this company is the development and maintenance of an online platform that allows freelancers to offer and request different services, such as the design of a new web site. Using this platform, freelancers can publish descriptions of projects they seek to be implemented. Service providers can then apply to these projects by offering bids. As of today, more than 225,000 service providers have registered for the platform and have generated a total project volume of over 150 million Euros.

Due to a strong growth in recent years, this organization faces a number of challenges with respect to the management of its business processes. In particular noncompliance with current work practices in its customer support effort recently resulted in a number of critical problems with customers. The support department consists of six employees, including a head of support and a head of financial services. All employees face a high workload caused by a high number of requests and unexpected issues. Their main task is to provide support via e-mail, but also via telephone and mail if required. Customers can contact customer service in English, German, Spanish, French, and Italian. To solve issues from customers, the support department collaborates closely with the technical department (e.g., to fix bugs in the platform) and with the financial department (e.g., to resolve financial issues related to projects or memberships).

The customer service department of this organization is well suited for investigating factors leading to noncompliance and the positive and negative effects of noncompliance on business process outcomes. First, the customer support staff faces a high number of unexpected inquiries and problems. Hence, they frequently *have to* deviate from established work procedures. Second, according to management, those deviations from business processes generated both positive and negative impacts on business process outcomes. The combination of those two factors makes this organization a potentially valuable site for studying different factors leading to noncompliance, different types of noncompliance, and different positive and negative outcomes.

Data Collection

We performed three main steps to collect the data for answering our research question: (1) process discovery, (2) deviation assessment, and (3) classification.

In the *process discovery* phase, we explored the work practices of the employees in the customer service department. Recognizing that different process discovery methods have distinct strengths and weaknesses (Dumas et al. 2013), we combined direct observations and semi-structured interviews. To adequately capture our insights, we documented the work practices using business process models. We started by passively observing the four customer support employees. We observed each employee for approximately four hours without any interaction. We took notes about the activities they performed and created initial documentation of the business processes the employees were involved in. In a subsequent feedback session, we refined our understanding of the processes and the individual activities. Building on these insights, we developed a guideline for a semi-structured interview, which we then used to infer the

management-intended business processes as well as the actual business processes. To document the business processes, we followed the procedure proposed by Frederiks and Van der Weide (2006) and the guidelines from Becker et al. (2000). In this way, we obtained consistent and high-quality process models.

In the *deviation assessment*, we compared the actual business processes with those that were intended by the management team. In collaboration with the respective process owners, we assessed whether each noncompliant behavior had a positive, a neutral, or a negative effect. We considered a noncompliant activity as positive if the process output improved or if the execution time decreased. We categorized a noncompliant activity as neutral if the process execution was changed slightly, but the output was not affected. We categorized it as negative if output quality decreased or execution time increased.

In the *classification* step, we used the notes from the direct observations and the interviews to tag each noncompliant behavior with the factor that triggered the deviation. Moreover, we tagged each occurrence as *intended* or *unintended* in order to differentiate between purposeful and accidental behavior.

Findings

In this section, we discuss the findings of our study. We first describe the discovered business processes. Second, we discuss the different factors triggering noncompliant behavior we observed in these processes. Finally, we elaborate on the effect of these factors on business process outcomes.

Business Processes that Were Discovered

We identified nine main business processes in the process identification step. We here briefly describe the version of each process that management considered to be compliant:

- **Account Deactivation (P1):** This process is concerned with deactivating accounts for users that did not pay their invoices. The process is triggered automatically after a pre-specified waiting time. After this, customer support sends request reminding the user to pay the open amount. If the user has not paid after the third reminder, their account is deactivated.
- **Account Deletion (P2):** This process is concerned with deleting a user account. It is triggered upon a user's request. The customer support department then checks whether the user has any open invoices. If this is the case, the user is contacted and asked to pay the invoices. Once all invoices were paid, the customer support department deletes the user's account.
- **Account Upgrade / Downgrade (P3):** This process is concerned with upgrading or downgrading a user account. It is triggered upon the user's request. In case of an upgrade, the customer support department sends instructions to the user on how to downgrade the account. In case of an upgrade, customer support forwards the request to the sales department, which then takes care of the upgrade.
- **Data Change Request (P4):** This process concerns changing or updating personal user information. Depending on the available time, the customer supports department changes the respective information or sends an instruction to the user how they can change the information themselves.
- **Mediation (P5):** This process is concerned with the mediation between a customer and service provider in case of a cancelled project. The process is triggered by a refund request from one of the involved parties. The customer support department first collects detailed information about the project. Then it informs both parties about the necessity to reach an agreement and suggests how to split the money that is involved. Customer support must continuously mediate and remain as neutral as possible until both parties have reached an agreement.
- **Mediation with Safepay (P6):** This process is similar to the mediation process (P5). However, it uses a Safepay mechanism to store money in an escrow account. The money will remain in this account until both parties have reached an agreement or a court has decided on the case. The role of the customer support department is to remain neutral and mediate between the parties. Once both parties have reached an agreement, the money is transferred.
- **Sales Request (P7):** This process is concerned with sales-related issues. It is triggered when a user asks for solving a sales-related problem. The customer support department first checks whether a solution for the problem is available in the records. If this is not the case, they forward the request to the sales department.

- **Money Discrepancy (P8):** This process is automatically triggered if the Safepay system detects a mismatch between the money transferred for a project and the project volume. The customer support department first checks whether the project volume is higher or lower than the amount transferred. Depending on the outcome, they contact the customer or provider and ask to either decrease the project volume or to increase the payment. In case of problems (e.g., customer or provider do not answer), the customer support department sends reminders. If the problem cannot be solved, the project is canceled.
- **Technical Request (P9):** This process is concerned with technical issues. It is triggered when a customer informs the department about a technical problem (e.g., some system functionality is not available). The customer support employee first checks whether the problem is known and whether a solution is available in the records. If this is not the case, they inform the technical department. If the technical department does not answer within seven days, the support department employee sends a reminder. Once the technical department has resolved the problem, the customer is informed about how the problem was or can be fixed.

Factors Triggering Noncompliance

Our study detected five main factors triggering noncompliant behavior. Table 1 gives an overview of these factors and provides examples for each type of noncompliant behavior. We here distinguish between factors associated with intended and unintended noncompliance. The number of observed instances per factor is indicated in brackets.

Class	Factor	Example
Intended (63)	Desire to improve process outcome (27)	- Asking why customer wants to delete account (P1). - Performing task on behalf of customer (P2,P3). - Calling customer instead of writing an e-mail (P4,P7,P9).
	Desire to prevent future mishaps (4)	- Inquiring a signed statement for a refund request (P5,P6). - Demanding a proof of payment in case of money discrepancy (P8).
	Desire to avoid tedious tasks (32)	- Not sending reminders before deactivating account (P1). - Not mediating between customer and service provider (P5,P6). - Not documenting finished case (occurred in all processes). - Forwarding case to sales department without checking whether solution exists (P7).
Unintended (61)	Lack of knowledge (23)	- Not deactivating user account although possible (P1). - Not providing mediation service if user does not use Safepay option (P5).
	Carelessness (38)	- Not checking whether user exists in system (P2,P3,P4). - Not inquiring why user wants to downgrade membership (P3).

Table 1. Factors Triggering Noncompliant Behavior

Intended noncompliance relates to actions that employees conduct fully aware of the fact that they are deviating from prescribed work practices. *Unintended noncompliance* results from mistakes or from a lack of knowledge about procedures. In the following, we describe the details of each factor related to intended and unintended noncompliance.

Desire to Improve Process Outcome

A desire of employees to improve the outcome of a process or the provided services can result in noncompliant behavior. As an example, consider the *Account Deletion* process (P2). We observed that some employees inquired about the reasons for closing an account. In this way, they hoped to collect feedback for improving the services of the organization in the future. Another example relates to actions that employees conducted on behalf of the customer. In the *Account Deletion* process (P2) as well as in the *Account Upgrade / Downgrade* process (P3), employees offered to take care of the deletion, upgrade or the downgrade in order to save customers from these efforts.

Desire to Prevent Future Mishaps

This factor relates to actions that are triggered by a desire to prevent potential problems in the future. For instance, the process *Mediation with Safepay* (P6) does not require employees to ask for a signed statement related to a refund request. However, we observed that employees did inquire for such statements. By doing so, they wished to avoid legal problems they have experienced in the past, when a consensus was not reached between the parties. We noted similar behavior in the *Money Discrepancy* process (P8), where employees demanded a proof of payment.

Desire to Avoid Tedious Tasks

Noncompliance associated with this factor relates to tedious and repetitive actions that employees decide to (occasionally) skip. As an example, consider the *Account Deactivation* process (P1), in which employees are required to send three reminders before deactivating a user account because of open invoices. We observed several instances of this process where employees did not send any reminders, but deactivated the account right away. Another example relates to the *Mediation with Safepay* process (P6). There, it is essential that an employee continuously mediates between the parties in order to reach a settlement related to a cancelled project. However, we noted several occasions where no mediation took place. In all processes, we furthermore found cases where documentation activities were skipped.

Lack of knowledge

This form of unintended noncompliant behavior occurred when employees were not aware of the possibility or the necessity of certain tasks. As an example of not being aware of certain possibilities, consider the *Account Deactivation* process (P1). In the context of this process, we observed several cases where the employee was not aware of the opportunity to deactivate an account in case the customer did not pay. As an example for not knowing about the necessity of a task, consider the *Mediation* process (P5). In several instances of this process, employees did not provide any mediation service because they thought that this is only required in the context of the *Mediation with Safepay* process (P6).

Carelessness

Actions associated with this factor relate to situations in which employees know about the requirement to conduct a certain task, but simply forget to do it (properly) for a specific case. For example, we observed several instances of employees not checking whether a user actually exists in the system before helping them (P2,P3,P4). In the interviews we learnt that the employees knew about necessity of this step, but forgot about it on particular occasions.

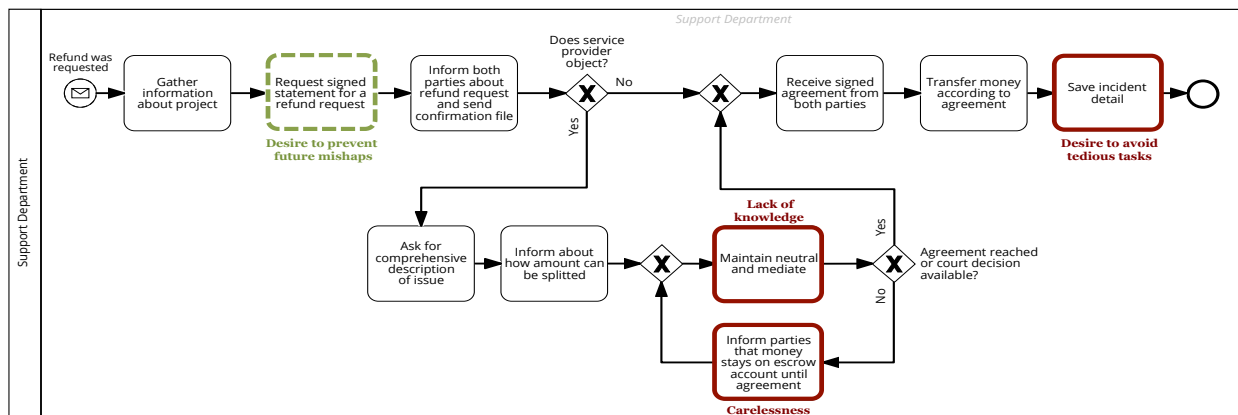


Figure 1. Noncompliance in the Mediation with Safepay Process

Effects of Noncompliance

We collaborated with the management team of our case study organization to assess the effects of the noncompliant behavior that we observed. Figure 1 illustrates the results by showing a process model of the Mediation with Safepay process (P6) in the Business Process Model and Notation (BPMN).

Each box in the model refers to an activity that needs to be executed. The bold solid (red) line denotes that a particular activity was subject to noncompliance with negative effects. In the context of this process, this either resulted from partially executing an activity (e.g., “Maintain neutrality and mediate”) or from omitting an activity altogether (e.g., “Save incident details”). The bold dashed (green) line denotes activities that relate to noncompliance with positive effects. In this case, the activity “Request signed statement for a refund” was added to process, that is, the management team did not ask the customer support employees to perform this activity.

Figure 2 gives a complete overview of all instances of noncompliant behavior along with the occurrence of positive or negative effects for each type of behavior. The reported numbers are grouped with respect to the factors we introduced in the previous section.

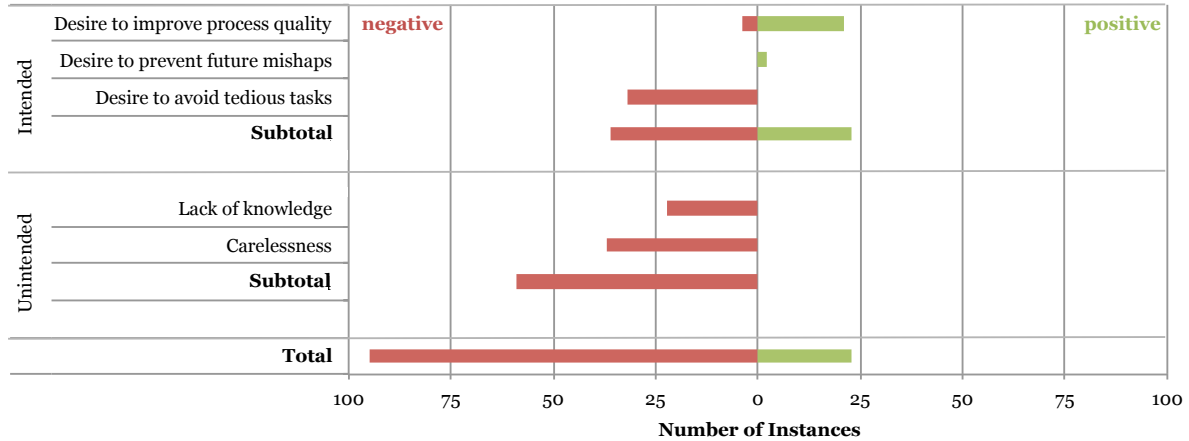


Figure 2. Effects of Noncompliant Behavior on Business Process Outcomes

Altogether, Figure 2 shows that most noncompliant behavior has a negative effect on business process outcomes. Out of the 124 cases of noncompliance we observed, the management team considered 95 as negative, 23 as positive, and 6 as neutral (not depicted). A detailed analysis of the classes of noncompliant behavior (intended versus unintended) as well as the related factors leads to a number of useful conclusions about the effects of noncompliance on business process outcomes:

- Well-intended noncompliance has mostly positive effects:** Well-intended noncompliance is often based on the *desire to improve process outcomes* and the *desire to prevent future mishaps*. That is, employees who were involved in such noncompliant behavior had the intention to improve the outcome of a particular process instance or to avoid anticipated problems. Hence, the effect of these actions on the outcome of the respective business processes was mostly positive. As an example, consider an employee asking customers why they want to delete their account (P1). Such an inquiry may result in valuable feedback for improving the company’s services. Another example relates to performing tasks on behalf of a customer such as upgrading or downgrading accounts (P3). Such service-oriented actions improve the customer experience and, therefore, may positively contribute to customer satisfaction and loyalty. However, in a few cases such well-intended actions also had negative effects. For instance, in the *Data change request* process (P4), we observed employees performing data changes on behalf of the customer without having sufficient time available. As a result, the handling of urgent issues was delayed.
- Negative effects of intended noncompliance are mainly caused by the avoidance of tedious tasks:** The *desire to avoid tedious tasks* is the main intended factor that negatively affects business process outcomes. The severity of the consequences resulting from this type of noncompliance varies considerably. Some noncompliant behavior related to this factor has rather manageable consequences. As an example, consider the direct forwarding of a case to the sales department without checking whether a solution exists in the database (P7). In the worst case, this noncompliance increases response time. The process goal will still be reached, however. In other cases, by contrast, severe consequences might occur. One example is when an employee deletes a user account and creates a new

one instead of modifying the existing account (P4). This act of noncompliance results in a complete loss of the customer's historical data.

- **Unintended noncompliance is a considerable risk for process outcomes:** We observed that unintended noncompliant behavior occurs quite frequently (61 out of 124) and is almost exclusively associated with negative effects on business process outcomes. For example, *carelessness* in the form of a failure to (accurately) document relevant information can result in data inconsistencies and data incompleteness. The most negative cases of noncompliance are triggered by a *lack of knowledge* and occur when employees are not aware of their responsibility to perform certain actions. As an example, consider the absence of mediation between service provider and customer (P5). In fact, the settlement of disagreements with respect to the services that have been provided by service providers is one of the key services of the organization. Inadequate service in this area is likely to result in customer churn and could harm the company's reputation.

Implications for Research

Our study shows that a more differentiated view on noncompliance is required. Noncompliance with clearly negative effects should be prevented, while noncompliance with mostly positive effects should not be prevented, and in some cases should be encouraged.

With respect to *noncompliance with negative effects*, our study highlights the need to better understand unintended noncompliance. While researchers have recognized the phenomenon of unintended noncompliance in general (Alter 2015), detailed insights are missing. Two promising directions for increasing the understanding of unintended noncompliance include the consideration of psychological as well as cognitive factors. From a psychological perspective, it is important to understand when employees perceive tasks as tedious and what organizations can do to motivate employees to execute such tasks thoroughly. Possible angles to investigate this matter include work motivation theory (Latham and Pinder 2005) or self-determination theory (Gagné and Deci 2005). From a cognitive perspective, it is interesting to investigate why employees cannot remember certain tasks (lack of knowledge) or why they forget to execute them (carelessness). Here, particularly the cognitive load theory can help to understand why employees may not be able to memorize or correctly recall procedures (Sweller 1994). A possible outcome could be to improve existing process documentation or to make new types of documentation available to employees. In the medical domain and aviation, for instance, checklists are widely established key aids to ensure the execution of critical tasks (Gawande 2010).

As for *noncompliance with positive effects*, our study reveals that it is worthwhile investigating how to foster beneficial noncompliance. One possible angle is to study how the design of commercial software, such as Enterprise Resource Planning or workflow systems, can facilitate positive noncompliance. One possibility might be to enable software to recognize exceptional circumstances and allow employees to handle these cases in a more flexible way. Another angle is to increase the understanding of how the work environment affects the occurrence of noncompliance with positive effects. For example, existing research has studied the relationship between the work environment, creativity, and innovation (Dul and Ceylan 2014). This may represent a promising starting point for understanding how to foster positive noncompliance in situations where relevant opportunities can be identified in advance.

Implications for Practice

From a practical perspective, our study highlights the need to implement measures for preventing negative effects of noncompliance. Depending on the factor triggering this noncompliance, different measures are required.

With respect to *intended noncompliance*, our study suggests that it is particularly important to make sure that tedious tasks, such as documentation and reporting, are conducted thoroughly. One way to improve this situation is by increasing the awareness about the importance of these tasks. We found that employees often did not consider these tasks as important as their other responsibilities. In these cases, training could already increase the level of compliance considerably. A technical alternative is to ensure the execution of tedious tasks through workflow systems or to implement monitoring systems that discourage detrimental noncompliance (Alter 2014). A more flexible solution is to develop mechanisms

that support execution of tedious tasks, for instance, with automated documentation features. In the medical domain, such systems have been proven to be promising (Banner and Olney 2009).

To ensure that (*originally*) *well-intended noncompliance* does not eventually lead to negative effects, it is essential to define guidelines. For instance, it must be clear to employees how much time they can allocate on supporting the customer in an unforeseen way. To this end, organizations should train their employees in a) recognizing situations in which noncompliance can be beneficial and b) how to prioritize such well-intended noncompliance in relation to other activities.

As for *unintended noncompliance*, training and different types of process documentation may help employees to correctly recall particular process steps. As discussed by Van der Aa et al. (2015), not all employees find it easy to read and interpret process models. For these employees, verbal work instructions or checklists may represent a more promising choice.

Conclusion

In this paper, we investigated the factors triggering noncompliant behavior that might have positive and negative effects on business process outcomes. To this end, we conducted a qualitative study in the customer service department of an IT company hosting one of Europe's leading online project platforms.

Our study identified five main factors that trigger noncompliance. Three of them relate to intended noncompliance and two relate to unintended noncompliance. We found that the desire of employees to prevent future mishaps and to improve the process outcomes were factors that generally had a very positive effect. The avoidance and omission of tasks caused the most negative effects. One of the key findings of our study is that unintended noncompliance relates to the cases with the most severe negative impact on process outcomes. As a whole, our study highlights the notion that the research discussion about noncompliance may benefit from a more differentiated view. In particular, noncompliance should not solely be regarded as a negative phenomenon. Our study shows that it can result in highly positive outcomes and may include innovative strategies to solve unforeseen problems. Thus, noncompliance with positive effects should be fostered, not prevented.

While the findings help to better understand noncompliant behavior, we acknowledge that there are limitations to our study. First, our findings are based on a case study in a single organization from a specific sector. We therefore cannot extrapolate to noncompliant behavior that, for instance, may occur in a production environment. Second, our findings are limited to a number of specific factors because we did not observe emergencies or other urgent cases. Despite these limitations, we believe that our study provides valuable insights for understanding the effects of noncompliance and for informing future studies with a complementary focus.

REFERENCES

- Alter, S. 2014. "Theory of Workarounds," *Communications of the Association for Information Systems* (34:55), pp. 1041-1066.
- Alter, S. 2015. "Beneficial Noncompliance and Detrimental Compliance: Expected Paths to Unintended Consequences," in: *Americas Conference on Information Systems*.
- Bagayogo, F., Beaudry, A., and Lapointe, L. 2013. "Impacts of IT Acceptance and Resistance Behaviors: A Novel Framework,").
- Banner, L., and Olney, C.M. 2009. "Automated Clinical Documentation: Does It Allow Nurses More Time for Patient Care?," *Computers Informatics Nursing* (27:2), pp. 75-81.
- Becker, J., Rosemann, M., and Von Uthmann, C. 2000. "Guidelines of Business Process Modeling," in *Business Process Management*. Springer, pp. 30-49.
- Brander, S., Hinkelmann, K., Hu, B., Martin, A., Riss, U.V., Thönssen, B., and Witschel, H.F. 2011. "Refining Process Models through the Analysis of Informal Work Practice," in *Business Process Management*. Springer, pp. 116-131.
- Dul, J., and Ceylan, C. 2014. "The Impact of a Creativity-Supporting Work Environment on a Firm's Product Innovation Performance," *Journal of Product Innovation Management* (31:6), pp. 1254-1267.
- Dumas, M., La Rosa, M., Mendling, J., and Reijers, H.A. 2013. *Fundamentals of Business Process Management*. Springer.

- Ferneley, E.H., and Sobrepeerez, P. 2006. "Resist, Comply or Workaround? An Examination of Different Facets of User Engagement with Information Systems," *European Journal of Information Systems* (15:4), pp. 345-356.
- Frederiks, P.J.M., and Van der Weide, T.P. 2006. "Information Modeling: The Process and the Required Competencies of Its Participants," *Data & Knowledge Engineering* (58:1), pp. 4-20.
- Gagné, M., and Deci, E.L. 2005. "Self-Determination Theory and Work Motivation," *Journal of Organizational behavior* (26:4), pp. 331-362.
- Gawande, A. 2010. *Checklist Manifesto, the (Hb)*. Penguin Books India.
- Halbesleben, J.R., Savage, G.T., Wakefield, D.S., and Wakefield, B.J. 2010. "Rework and Workarounds in Nurse Medication Administration Process: Implications for Work Processes and Patient Safety," *Health care management review* (35:2), pp. 124-133.
- Koopman, P., and Hoffman, R.R. 2003. "Work-Arounds, Make-Work, and Kludges," *Intelligent Systems, IEEE* (18:6), pp. 70-75.
- Lalley, C., and Malloch, K. 2010. "Workarounds: The Hidden Pathway to Excellence," *Nurse Leader* (8:4), pp. 29-32.
- Latham, G.P., and Pinder, C.C. 2005. "Work Motivation Theory and Research at the Dawn of the Twenty-First Century," *Annu. Rev. Psychol.* (56), pp. 485-516.
- Lu, R., Sadiq, S., and Governatori, G. 2008. "Compliance Aware Business Process Design," *Business Process Management Workshops*: Springer, pp. 120-131.
- Melão, N., and Pidd, M. 2000. "A Conceptual Framework for Understanding Business Processes and Business Process Modelling," *Information systems journal* (10:2), pp. 105-129.
- Outmazgin, N. 2012. "Exploring Workaround Situations in Business Processes," *Business Process Management Workshops*: Springer, pp. 426-437.
- Outmazgin, N., and Soffer, P. 2013. "Business Process Workarounds: What Can and Cannot Be Detected by Process Mining," in *Enterprise, Business-Process and Information Systems Modeling*. Springer, pp. 48-62.
- Regev, G., Bider, I., and Wegmann, A. 2007. "Defining Business Process Flexibility with the Help of Invariants," *Software Process: Improvement and Practice* (12:1), pp. 65-79.
- Reichert, M., and Weber, B. 2012. "Business Process Compliance," in *Enabling Flexibility in Process-Aware Information Systems*. Springer, pp. 297-320.
- Röder, N., Wiesche, M., and Schermann, M. 2014a. "A Situational Perspective on Workarounds in It-Enabled Business Processes: A Multiple Case Study,").
- Röder, N., Wiesche, M., Schermann, M., and Krcmar, H. 2014b. "Why Managers Tolerate Workarounds—the Role of Information Systems,").
- Rosemann, M. 2006. "Potential Pitfalls of Process Modeling: Part A," *Business Process Management Journal* (12:2), pp. 249-254.
- Sadiq, S., Governatori, G., and Namiri, K. 2007. "Modeling Control Objectives for Business Process Compliance," in *Business Process Management*. Springer, pp. 149-164.
- Soffer, P. 2005. "On the Notion of Flexibility in Business Processes," *Proceedings of the CAiSE*, pp. 35-42.
- Sweller, J. 1994. "Cognitive Load Theory, Learning Difficulty, and Instructional Design," *Learning and instruction* (4:4), pp. 295-312.
- Türetken, O., Elgammal, A., van den Heuvel, W.-J., and Papazoglou, M.P. 2011. "Enforcing Compliance on Business Processes through the Use of Patterns," *ECIS*.
- Unger, M., Leopold, H., and Mendling, J. 2015. "How Much Flexibility Is Good for Knowledge Intensive Business Processes: A Study of the Effects of Informal Work Practices," *Proceedings of the HICCS*: pp. 4990-4999.
- Van der Aa, H., Leopold, H., Mannhardt, F., and Reijers, H.A. 2015. "On the Fragmentation of Process Information: Challenges, Solutions, and Outlook," in *Enterprise, Business-Process and Information Systems Modeling*. Springer, pp. 3-18.
- Wiesche, M., Schermann, M., and Krcmar, H. 2013. "When It Risk Management Produces More Harm Than Good: The Phenomenon Of mock Bureaucracy" *Proceedings of the HICCS*: pp. 4502-4511.
- Yin, R.K. 2013. *Case Study Research: Design and Methods*. Sage publications.