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Davison, Robert M; Ou, Carol XJ; Ng, Evelyn

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Inadequate Information Systems and Organizational Citizenship Behavior

Robert M Davison  
City University of Hong Kong  
Tat Chee Avenue, Kowloon  
Hong Kong  
isrobert@cityu.edu.hk

Carol XJ Ou  
Tilburg University  
Warandelaan 2, 5037 Tilburg,  
The Netherlands  
carol.ou@uvt.nl

Evelyn Ng  
University of Sydney  
Sydney, NSW 2006  
Australia  
yat.ng@sydney.edu.au

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Abstract

In this study, we examine how employees engage in organizational citizenship behavior (OCB) that contributes toward their work performance related to IS usage in a small-medium sized manufacturing firm in southern China. We uncover instances of OCB that correspond to salient characteristics of the Chinese social culture, in particular when facing inadequacies in systems, organizational training, and personal skills. We inductively analyze our findings, blending them with the literature to propose a new theoretical model that explains the antecedents and consequences of IT-centric OCB in organizations.

Keywords: Organizational citizenship behavior (OCB), professional responsibilities, enterprise resource planning (ERP), system inadequacies, China

1. Introduction

The role that Information Systems (IS) professionals play in organizations is continuously evolving (Deng et al. 2015). Historically, IS professionals focused more on the technical aspects of IS development and implementation (Benbasat et al. 1980). However, since the mid-1990s, the expectation has been that they need to function as consummate employees (Lee et al. 1995) who can interact with a range of internal colleagues from different functional departments, thereby contributing to organizational agility (Zhou et al., 2018). The role of IS professionals is further complicated by the fact that IS knowledge today is scarcely their exclusive property (Davis 2013): instead, the digital natives who comprise most junior employees have embedded the internet and its many applications into their social and working lives (Davison and Ou 2017; Schultze and Mason 2012; Clarke 2011). IS professionals must now undertake problem solving activities across the organization, providing support for a variety of IS and applications, including large scale software such as Enterprise Resource Planning (ERP) (Pawlowski and Robey 2004; Deng et al. 2015). IS professionals, thus, have a dichotomous set of responsibilities: they provide technical support for IS and at the same time support business users.
Prior research has tended to prioritize the role of IS professionals in larger organizations, which are often characterized by well-endowed IS departments (Levy and Powell 1998). Nevertheless, small and medium-sized (SME) organizations offer an equally valuable research opportunity, given the significant role that they play in national economies (Radas and Bozic 2009). In SMEs that are often characterized by the absence of organizational slack, IS professionals are rarely numerous, and so must exercise responsibility for multiple aspects of the systems environment (Levy and Powell 2000; Chan et al., 2019). In this, they are supported by those regular employees who are individually responsible and motivated to accomplish their tasks at a high level of performance (Osabiya 2015). Employees who go beyond the call of duty, helping their colleagues or undertaking tasks in a discretionary manner, are engaging in what is known in the literature as Extra-Role Behavior (ERB) or Organizational Citizenship Behavior (OCB) (Organ 1988; Organ et al., 2006). OCB is considered to be a major contributor to organizational success, because employees who voluntarily engage in OCB help the organization in difficult times, e.g., when their colleagues are sick or lack experience (Chou et al. 2013).

There has been considerable prior research conducted on OCB in Western countries. However, there are few studies in countries such as China, where different organizational cultural norms apply and so where the notion of what constitutes OCB may vary significantly. Still fewer studies explore OCB in the context of IS, let alone in SMEs where, paradoxically, OCB may be particularly valuable considering the lack of both human resources and IS to fulfill business requirements. In this research, we investigate this trifecta of opportunities, OCB in a Chinese SME with particular focus on the IS aspects, and seek to answer the research question: How and why do employees engage in OCB with respect to IS use? We present the research as an interpretive case study, drawing on interviews with employees in the workplace, in an SME that we pseudonymize as Hardware Systems. Following this introduction, we review the literature on OCB, before turning to the research context and methods. We present the case description and discuss its implications for both OCB and IS research by formulating a high-level research model and associated propositions before concluding the article with implications for theory and practice.

2. Literature Review

OCB has a long and illustrious history in studies of organizations. Its scholarly origins lie in the work of Roethlisberger and Dickson (1964), and Katz (1964, p.131), who explained how organizations need employees who engage in “innovative and spontaneous activity that goes beyond role prescriptions.” Katz (1964, p.133) further opined that these activities would include “a myriad of acts of cooperation, helpfulness, suggestions, gestures of goodwill, altruism, and other instances of what we might call citizenship behavior.” These supererogatory activities are usually essential to organizational health (Roethlisberger and Dickson 1964). However, notwithstanding their value, these activities which reside outside normal work, are neither controlled nor incentivized by the organization. OCB was first formalized by Organ (1988, p.4) who defined it as “individual behaviour that is discretionary, not directly or explicitly recognized by the formal reward system, and that in the aggregate promotes the effective functioning of the organization.” At the individual level, OCB involves “acts of altruism or helping behavior such as assisting a worker with a heavy workload, sharing resources, giving emotional support, and being courteous” (Frenkel and Sanders 2007).
2.1 The Manifestation of OCB

The component parts of OCB have been the focus of meta research in a number of papers. Podsakoff et al. (2000), reviewing the empirical literature published in 1998, identified a parsimonious set of seven forms, including helping behavior, sportsmanship, organizational loyalty, organizational compliance, individual initiative, and civic virtue. A decade later, Podsakoff et al. (2009) reported 650 articles in the management literature, while a 2019 Google Scholar search for “Organizational Citizenship Behavior” suggests in excess of 64,000 results. The predominant disciplines where this research has been conducted are management, applied psychology, and organizational behavior. In the IS discipline, the level of interest is much less frenzied.

2.2 OCB in the IS Literature

Despite an extensive search of the literature, we are only able to locate eight studies that document OCB/ERB in the IS context, (i.e., D'Arcy and Lowry, 2019; Chou et al. 2013; Davis 2013; Deng and Wang 2014; Deng et al. 2015; Hsu et al. 2015; Cui 2017 and Zou et al. 2017). These studies are typically concerned with the behavior of either IS or non-IS personnel who engage in various forms of IS work. An exception is Zou et al. (2017) who consider the technologically focused ERB of social media users who help one another online. As such users are not organizational employees, they fall outside our scope and will not be considered further.

Five types of customer-oriented OCBs of IS personnel can be identified (Deng et al. 2015): (1) education (taking extra care to ensure that users understand the technical features of a system); (2) anticipation (providing information that is not specifically requested so as to help the user to use a system effectively); (3) justification (providing additional information that explains a situation in greater detail than necessary); (4) personalization-technology (personalizing the way the user can use the technology); and (5) personalization-business (personalizing the information that the user can obtain).

This kind of customer-focused OCB takes the form of “employees’ discretionary behaviors in serving customer interests and needs not explicitly requested” and serves the purpose of supporting their non-IS colleagues working in functional units (Deng et al., 2015, p.495). They observed that IS personnel offered assistance to ERP users by “explaining the causes of the problems, rather than simply providing guidelines,” even though those users had not specifically requested that assistance.

In a related study, Deng and Wang (2014) noted how IS personnel were more likely to take the time to explain and solve problems than provide procedural instructions and help files. This was more useful to the employees, who learned how to solve their own problems, though it necessitated more time on the part of the IS personnel. In a similar vein, the role of ERB was considered in enhancing information security policies (Hsu et al., 2015). To engage in ERB, employees and managers need to go beyond in-role, contractually required behavior as “performing extra-role behaviors can help employees monitor and report bad behavior and/or help less capable employees work more effectively” (ibid. p.294). They also suggest that “more extra-role behaviors can be expected when employees are attached to their coworkers, are involved in IS

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1 It is important not to use the abbreviation “OCB” as a search term, because it can also refer to Obsessive Compulsive Behavior, an entirely different matter.
creation activities, share security beliefs, and are highly committed to their organizations” (ibid., p. 293). As Chou et al. (2013, p.105) also note, employees are more likely to engage in OCB when they are mutually dependent within a team and “share the responsibility to accomplish a defined task.”

The competence and attitude of the non-IS worker is also central to OCB. Davis (2013, p.403) observes that “as business users continually gain experience with enterprise systems and a new generation of tech-savvy workers enters the labor force, IT competence is increasingly distributed beyond the IS department.” The extent to which non-IS personnel are willing to volunteer their competence and thereby contribute to organizational success is clearly significant; perhaps particularly in SMEs where organizational slack is absent (Major and Cordey-Hayes 2000) and where IS personnel are few in number. Volunteering one’s technical competence is thus a form of OCB, because it will entail increased workload and responsibilities that may not be rewarded (Bergeron 2007). Non-IS personnel are considered more likely to volunteer their technological competence, when they have a strong relationship with and loyalty to the organization (Davis, 2013).

2.3 OCB in China

While the prior literature on OCB is extensive, it is largely informed by studies undertaken in larger organizations and Western contexts. Despite the global importance of the Chinese economy, few studies have been conducted to examine the relevance of the OCB constructs in Chinese societies. Moreover, these few studies tend to replicate those undertaken in the US (Farh et al., 2004). A prominent exception is Farh et al.’s (1997) development of an indigenous measure of OCB in China. Drawing on the literature in distributive justice, where very different values are known to exist across cultures, Farh et al. (1997) suggested that in a Chinese organization, traditionally minded employees will often engage in OCB according to the roles that they play and to satisfy their “self-derived obligations to the company” (ibid. p.424). However, different patterns are likely among employees with a more contemporary mindset, given a preference for a more Western-style equity with rewards that are based on individual contributions (ibid. p.425; Chou et al. 2013).

Farh et al. (1997) developed and validated five dimensions with a 22-item scale, to measure OCB in Chinese contexts based on the data from individual employees in Taiwan. Two of these dimensions (“interpersonal harmony” and “protecting company resources”) do not appear in Podsakoff et al.’s (2000) seven forms of OCB based on Western literature. Considering these two new dimensions: (1) interpersonal harmony is defined as discretionary behavior “by an employee to avoid pursuing personal power and gain with detrimental effects on others and the organization;” (2) protecting company resources is defined as discretionary behavior “by an employee to avoid negative behaviors that abuse company policies and resources for personal use” (ibid. p.429).

Farh et al. (2004) extended their earlier work through an inductive analysis of instances of OCB in China. This led to the identification of ten dimensions of OCB, namely taking initiative, helping coworkers, voice (making helpful suggestions), group activity participation, promoting company image, self-training, social welfare participation, protecting and saving company resources, keeping the workplace clean, and interpersonal harmony. Among these ten dimensions, “helping others” and “interpersonal harmony,” which were also identified by Farh et al. (1997), are most salient to the current study.
Helping others, in particular coworkers, which is often referred to as altruism, is a prominent component of the OCB phenomenon globally, with considerable evidence supporting its existence. Closely related to helping others (see also Zhu 2013) is the idea of interpersonal harmony. Farh et al. (2004) emphasize the importance of harmony in the Chinese context, where a strong belief that “conflict is harmful to organizations” (ibid., p.250) prevails. Hexie (和諧) (interpersonal harmony) is a well-known component of the broader guanxi (關係) (mutually obligatory interpersonal relationships) phenomenon that is ubiquitous in Chinese society (Ou et al., 2014; Davison 2017). Other relevant components of guanxi include ganqing (感情) (affection), xinyong (信用) (trust), and huibao (回報) (reciprocity). Also cognate is the affective commitment or loyalty of employees to their company, because through this commitment, a more harmonious culture may be created (Chen and Francesco 2003).

An additional concept prevalent in the Chinese context, though not previously linked to OCB, is zerengan (責任感), usually translated as a “sense of responsibility.” Zerengan is sometimes linked with the tenure of a position or role. In essence, there are normative but self-derived expectations for the kind of behavior that is expected of a role (Nadel 1957) including social norms (Parsons 1951), and what is taken for granted (Zucker 1977). A person with a prominent position in a social or work network should be aware of these normative expectations for the responsibilities that go with the position and how to act (cf. Farh et al., 1997). As a result, this person may engage in OCB more readily (Lamertz 2005). Research on zerengan is limited in the Chinese context. However, as Lu and Koehn (2015) explain, even though the associated role expectations may not be formally stated, they can still be implicitly and morally obligatory. Yeophantong (2013) affirms that “the notion that the legitimate exercise of power is tied to the burden of responsibility is one that resonates strongly in Chinese society” (p.333). As a result, “behaving ‘responsibly’ involves acting in accordance with both the formal and the informal rules governing society and its institutions, such that compliance with established norms and values amounts to an observable outcome of responsible behaviour” (ibid. p.334).

Studies of OCB in China suggest the salience of some new forms of OCB, for instance interpersonal harmony and the role-based sense of responsibility. However, there is a lack of consensus as to what are the basic components, antecedents, and consequences of OCB. Where studies of OCB in an IS context are concerned, the few studies tend to focus predominantly on supererogatory helping behavior. Finally, the OCB of non-IS personnel, who may need to orchestrate the technology-intensive environment for work operations, should not be ignored, especially in smaller organizations where resources may be in short supply.

3. Research Context and Method

We undertook this research in an SME that we refer to as Hardware Systems. We selected this company, which is physically located in the city of Zhongshan in southern China, because it is a well-established firm with a stable history of IS use and a mix of long term and recently hired employees. In many ways, it is a typical manufacturing SME in China. Hardware Systems was established in 1995 and employs 400 people in the manufacture of hardware components for doors, windows, furniture, and bathrooms. These products are exported to customers globally. The company also custom designs and manufactures specialized hardware items from small components to entire door structures.
The method that we apply in this research is an interpretive case study (see Klein and Myers 1999). We explored a unique and emergent phenomenon that was unexpectedly revealed during an on-going research investigation (see Pan and Tan 2011). We characterize this as a holistic, revelatory case study (Sarker et al., 2012). Naturally, there are limits as to how far we can generalize our explicit findings through acts of induction to other contexts (Seddon and Scheepers, 2012). Nevertheless, we elicit from our findings new theoretical relationships that can be further tested by researchers in other contexts (Lee and Baskerville, 2003, 2012). Our research is thus interpretive because we immersed ourselves into the world of the organizational employees (case participants), from which we synthesize and interpret our findings (Myers, 1997) into the new theoretical propositions, all of which are “produced as part and parcel of the social interaction of the researchers with the participants” (Klein and Myers, 1999, p.74).

In April 2017, we undertook face-to-face interviews with thirteen employees of Hardware Systems. Interviewees were first selected on the basis of their regular use of and familiarity with the ERP software that is central to information integration in the firm; and secondly their position (we wanted to interview employees at different levels, including both managerial and nonmanagerial staff) (see Table 1 for demographic information about the interviewees) as part of a study into the use of technology in the workplace. The interviews averaged one hour each.

In the course of the interviews, we serendipitously identified an unexpected finding that is the focus of the current study and which we expand on in the case section below. This finding is related to the way certain employees appeared to deliberately neglect their ERP-based work duties on a regular basis; their neglect, however, was compensated for by some of their colleagues. Although we did not prepare questions about this situation (we were not expecting to find it), we explored it in greater depth when we realized what was happening. In December 2017, we returned to the firm in a follow-up visit to ask more detailed questions about the behaviors we had previously observed, interviewing six employees a second time as well as three employees not interviewed previously. Data saturation was reached with this population of sixteen employees (Urquhart et al., 2010).

Although we were broadly familiar with the OCB literature, we did not set out to test hypotheses or propositions that had been created in advance, as explained above. Nevertheless, our broad interview protocol (see Appendix 1), facilitated our semi-structured interviews with employees. We were able to observe employees in the workplace, and interacted with them so as to ask specific work-related issues. All interviews were undertaken in Chinese (Cantonese or Mandarin), recorded with employee permission, transcribed, and translated for analysis.

All data were coded thematically following the principles associated with qualitative data coding and analysis (see Martinsons and Hempel, 2009; Young et al., 2012). The first author performed the initial coding of the data. This was validated by the second author and further scrutinized by the third author.

4. Case Study

We first describe the ERP software, briefly introducing its functionality and aspects of its implementation that may restrict the way employees use it. We next examine the issue of how employees are trained to use the system. This leads to a narrative of how employees actually use the system, and the associated aspects of responsibility to perform their designated work tasks (Langley 1999). We illustrate the case with
quotations from interviews with employees at all levels, and with reference to the
literature where appropriate. All employees are identified with a letter code (see Table
1).

Table 1: Demographics of ERP System Interviewees

<table>
<thead>
<tr>
<th>Code</th>
<th>Gender</th>
<th>Job Title</th>
<th>Interview Time in 2017</th>
<th>Duration of Employment (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>F</td>
<td>Sales manager</td>
<td>Dec</td>
<td>10</td>
</tr>
<tr>
<td>F</td>
<td>F</td>
<td>Assembling supervisor</td>
<td>April</td>
<td>4</td>
</tr>
<tr>
<td>G</td>
<td>M</td>
<td>Engineering manager</td>
<td>April, Dec</td>
<td>8</td>
</tr>
<tr>
<td>L</td>
<td>M</td>
<td>ERP practitioner</td>
<td>April</td>
<td>2</td>
</tr>
<tr>
<td>M</td>
<td>M</td>
<td>Engineer</td>
<td>April</td>
<td>0.3</td>
</tr>
<tr>
<td>N</td>
<td>F</td>
<td>Sales executive</td>
<td>April</td>
<td>2</td>
</tr>
<tr>
<td>O</td>
<td>F</td>
<td>Sales manager</td>
<td>April</td>
<td>1</td>
</tr>
<tr>
<td>S</td>
<td>F</td>
<td>Sales supervisor</td>
<td>April, Dec</td>
<td>7</td>
</tr>
<tr>
<td>SH</td>
<td>M</td>
<td>Material worker</td>
<td>April, Dec</td>
<td>5</td>
</tr>
<tr>
<td>V</td>
<td>F</td>
<td>CEO</td>
<td>April, Dec</td>
<td>22</td>
</tr>
<tr>
<td>W</td>
<td>M</td>
<td>Planning manager</td>
<td>April, Dec</td>
<td>10</td>
</tr>
<tr>
<td>X</td>
<td>F</td>
<td>Finance manager</td>
<td>April, Dec</td>
<td>3</td>
</tr>
<tr>
<td>Y</td>
<td>F</td>
<td>Warehouse worker</td>
<td>April, Dec</td>
<td>2</td>
</tr>
<tr>
<td>Z</td>
<td>F</td>
<td>Purchaser</td>
<td>April</td>
<td>1</td>
</tr>
<tr>
<td>ZH</td>
<td>M</td>
<td>Production manager</td>
<td>April</td>
<td>1</td>
</tr>
<tr>
<td>ZY</td>
<td>F</td>
<td>Warehouse manager</td>
<td>Dec</td>
<td>1</td>
</tr>
</tbody>
</table>

4.1 ERP Issues/Problems

The ERP software is designed to support planning, production, procurement, sales, and shipping functions at Hardware Systems. It is developed by Yonyou, China’s largest domestic ERP developer. Version 10.2 was in use when we visited, though a more updated version 12.5 was reportedly available. License restrictions limited simultaneous logins to five, which led to delays if employees had to wait for someone to log out before they could log in. An engineering manager [G] remarked: “There are only a few access points to the system so I have to send a private message using WeChat to tell others to logout when they have finished a job so as to allow me to use it. Even if you have urgent tasks to do, you may need to wait a few hours before you can log in.” This was corroborated by a production manager [ZH] who observed: “Due to the limited number of access points, if people do not logout promptly, then the others can’t access the system.” The employees reported that the design of the system is rather inflexible: One planning manager [W] commented: “When we are dealing with a customer’s request, the system may not help us to finish our work quickly. After I create a Bill of Materials (BOM), adding more materials requires a complete change: all the data needs to be re-entered and I have to go through the whole process again.”
Indeed, some employees reported that the ERP software could not support certain essential functions at all. Unsurprisingly, a sales supervisor [S] explained that she had to export data to Excel, where it is easier to manipulate to satisfy the different requirements of customers.

4.2 Issues of ERP Software Training and Use

Although the ERP software was seen by employees and managers as important for supporting work, a number of problems arose. Not only were some of the design features inflexible, but many employees commented on the poor quality of training provided by Hardware Systems. The planning manager [W] noted: “We really need training because we must use the system all the time. ERP is not helpful for warehouse colleagues who receive little training to explain how the system works. As a result, they cannot create BOMs correctly and you can find mistakes in each BOM.” In a similar vein, a sales supervisor [S] remarked that “The ERP is not difficult to use if we are familiar with the software, but we are not. We don’t have on-the-job training. If we have problems, we can only communicate with the ERP practitioner, but he does not teach us step-by-step.”

The issue of employee competence is critical to ERP success (Somers and Nelson 2001). Poorly trained and poorly motivated employees who failed to use the ERP correctly, and employees who lacked a sense of responsibility for their work, were a recurring problem. A purchaser [Z] told us that “some staff input the data late or the input is not complete, which causes inaccuracies. Some staff don’t follow the correct procedure or jump from the second part to the fifth part (for the inputs).” The finance manager [X] made the more general remark that “if no one requires the employee to do the job, he or she simply gives up. No one tells the employee that he or she can’t give up doing the job. Then the employee ignores the duty and no one does the job.” To counter this situation, the finance manager [X] continued by noting how she tries “to influence the less motivated colleagues to be more engaged in their work.” If this fails, she keeps “a close eye on them, to ensure they do not make mistakes on their jobs, for example, keying in data incorrectly.”

Hardware Systems employed an ERP practitioner [L] to train employees and troubleshoot problems. However, we witnessed a certain degree of friction between this individual and other employees at all ranks. For instance, he [L] pointedly remarked that “staff are incompetent. Colleagues need to undertake statistical analysis but they are weak in this respect. There are many functions that colleagues do not use, including process management, cost accounting, salary calculation. They don’t know how to use these functions.” More seriously, but consistent with the finance manager [X], he suggested that “the employees are lazy. I require each department to check the data and search for information, but in the end they give up because they don’t care about this. If I don’t supervise them, they won’t do it.” The ERP practitioner suggested that there is a cultural aspect to the situation: “Colleagues are passive to learn and ask for help. I require them to ask me if they don’t understand but they are too passive. Every time I need to ask them what difficulties they have. They will never ask me actively.”

As noted above, some employees found it hard to communicate with the ERP practitioner, suggesting that the situation is at least two-sided. For instance, the finance manager [X] reported “I have difficulty communicating with the ERP practitioner. Even though I try to communicate my opinions to him, he either
misunderstands or has a different interpretation of the same issue. I can't agree with his explanation and response. He can only solve half of the problems of the system."

4.3 OCB in Hardware Systems

The evident problems associated with the use of the ERP software, the way employees are trained in its use, and their competence constitute one important narrative in the story at Hardware Systems. However, this is not the only narrative: we also observed other behaviors that tell a different story. For instance, the finance manager [X] explained how she “voluntarily helps her colleagues ... on an over-time basis at night ... first, when they cannot finish their work; second, when they are sick and absent from work.” She also explicitly mentioned that she personally checked with the ERP provider when the ERP practitioner couldn’t solve the problems onsite. As Hardware Systems had only started the cost management module a few weeks ago, she often needed to learn by herself how to transfer and integrate the information from the existing ERP modules after normal working hours. This overtime work was never remunerated. We found that such OCB is not unusual in Hardware Systems. The sales supervisor [S] confirmed this attitude, noting that “If colleagues are absent from work, their work must be replaced by someone else. The work is usually allocated by managers, and we are comfortable to do the extra job without complaint; we don’t mind doing it.” The warehouse manager [ZY] also confirmed how he would help colleagues who are unfamiliar with the ERP system by teaching them “how to use it effectively, for example, how to check information in the system. If there are duties that they forget or don’t know how to do, I will remind them and show them how to do it.” As previously described, the BOM files in the ERP were often constructed incorrectly; this also happened with some data in the financial and warehouse modules. These mistakes required continuous monitoring and supervision from the managers, meaning extra efforts need to be taken on the details and in educating others. The planning manager [W] described similar behaviors, explaining: “I think this is part of my job responsibility.”

4.4 The Sense of Responsibility: Professionalism and Actions in OCB

The notion of a sense of responsibility or zerengan is central to the way some managers at Hardware Systems approach their work. It would be misleading to trivialize the associated helping behavior as little more than collegial altruism. Several employees discussed in detail how their actions are not merely altruistic, but rather are born of a sense of responsibility. The warehouse manager [ZY] noted that “there are a lot of things that are far beyond my job responsibility, but when there are things I can do to improve the efficiency of work, I would do them.” The sales supervisor [S] reiterated the point, observing “when my colleagues need help, I help. This is not because we are close to one another, it is because of the sense of responsibility. When colleagues ask for help, we should help them without hesitation.” The finance manager [X] expressed a deep sense of responsibility and loyalty to the company: “I feel shameful if I do not do my job well. This is because I treat the company as my home. Hence, no matter how busy I am at work, or working overtime, I do not complain. I just want to do the job well, and it is truly from the bottom of my heart.”

Attributed to the sense of responsibility, many staff members at Hardware Systems are willing to do something extra. For instance, the engineering manager [G] indicated that Hardware Systems primarily manufactures nonstandard products, and therefore, most components of each BOM are different. However, the current ERP system
cannot be integrated with a product design system such as CAD for the blueprint drawing information. Therefore, some mistakes may occur during the transferring process of such information from one system (such as CAD drawings) to another (such as ERP) for the BOM setting. To avoid any potential mistakes, the engineering department often needs to carefully check the BOM information and communicate with the sales, production, and material purchase departments accordingly. This is not an automatic process and it requires not only professional responsibility but also extra care on BOM settings in the ERP. Considering that the current process is not ideal, the engineering manager [G] suggested that a business process reengineering (BPR) approach could help and volunteered to provide assistance if needed in the BPR process.

It is notable that the sense of responsibility is not only found at the managerial level. A material worker [SH], who is a junior employee, suggested many ways in which process improvements could be achieved involving the ERP software. He clearly pointed out that the existing problems in using the ERP relate to the absence of standard practices in current work processes. He observed that he regularly shared his previous experience of using SAP ERP with his coworkers, and commented on such issues as ERP support, training, and information internalization. During an hour-long interview, he suggested many creative and innovative initiatives that could improve the current work arrangements at Hardware Systems.

4.5 Case Reflections

We conducted the above interviews and also the observations on two occasions based on the arrangement from the CEO of Hardware Systems [V]. The CEO had several face-to-face meetings with the research team before, during, and after the interviews. Her desire to improve the way in which the ERP software was used, the business processes, and employees’ job performance was clear. The interviewees (including the managers and front-line employees) have highlighted the CEO’s strong commitment to the company, and her influence on the employees of Hardware Systems. We observed that the CEO appeared to work around the clock, keeping herself engaged all the time on phone calls, emails, and social media to solve internal and external problems. Indeed, she slept in the office most nights. In addition to these professional business activities, the CEO also often organized after-work activities, such as meal gatherings, karaoke, sports, exercise, and city tours. Her working philosophy of engaging with employees involved both professional work and social activities. Together, these brought energy, agility, and harmony to the company, as evidenced by several interviewees [ZY, S, X, and SH]. For instance, a planning manager [W] mentioned the harmonious culture of the company and the finance manager [X] observed that the CEO treated all employees like family members. The material worker [SH] commented “we are like a big family.”

5 Discussion

In the literature, there is a general consensus that both the absence of technical skills and inadequate on-the-job training can contribute to problems among employees who need to use a variety of different IS (Wong et al. 2005): their motivation to work, their sense of care when performing their work, and their enthusiasm can all suffer. These can lead to serious negative consequences for the organization (Wendin 1999). Among IS applications, ERP software is particularly problematic, because of its complexity, with employees often “unable to acquire sufficient knowledge or skills” (Wong et al. 2005) and therefore lacking knowledge about ERP functionality (Alojairi
et al. 2013). Poor training is thus a critical failure factor commonly associated with ERP implementation (Wong et al. 2005). Even though we do not suggest that the ERP in Hardware Systems has failed, there are certainly deficiencies that exert a negative impact on day-to-day operations, leading to the situation where some employees feel the professional responsibility to undertake unpaid overtime work to cover for their colleagues. Many employees noted that they have inadequate formal training in how to use the ERP. Such training often takes the form of on-the-job training and associated skills development, which are considered to be indispensable for a successful business (Silvennoinen and Nori 2017) and determining factors for successful system implementation, ensuring that employees have the competence to understand system functionality (Ignatiadis and Nandhakumar 2009). However, the question of employee competence was raised in this study, again reflecting weaknesses in the training regime. Lin and Hsu (2017) noted a significantly positive relationship between on-the-job training and work achievement, pointing out that it provides employees with professional knowledge and skills leading to workplace competence. However, such training needs to be conducted repetitively, because knowledge decays with time if not reinforced (Arbesman 2012). Informally, we observed managers providing additional repetitive training for their subordinates. However, it appeared that this was insufficient, as some managers also needed to engage in overtime work to complete the tasks of their subordinates.

The OCB literature consistently identifies a number of components. We regard some of these, notably organizational loyalty and civic virtue, as constituting mental states whose presence is essential to the later manifestation of actual OCB. Examples of actual behaviors that are relevant to the current case include helping behavior, altruism, individual initiative, and self-development (see Podsakoff et al. 2009). Through an analysis of our interview data, we noted the frequently expressed sense of professional responsibility or *zerengan*. This is akin to what Farh et al. (1997) refer to as “self-derived obligations” and to what Lu and Koeln (2015) considered to be implicit yet still morally obligatory responsibilities of employees. While the sense of responsibility is accepted as an independent concept in the literature, this is the first time that it has been explicitly identified as a driver of OCB. Although the volume of evidence in this study is limited, several employees repeatedly talked about their sense of responsibility to the company. We suggest that the sense of personal, implicitly obligatory professional responsibility acts as a driver of the kinds of specific IS-based OCB actions that employees take, such as helping others, workarounds, problem solving, and changes to working processes.

When employees experience difficulties in their work, whether due to inability, incompetence, lack of time, or sickness, another employee, often a manager, who has a strong sense of professional responsibility, is likely to intervene to help resolve the situation. If necessary, the manager may provide additional training to the employee in the missing skills so as to enhance competence. Thus, when experiencing problems associated with software or work processes, employees (both managers and junior employees) can create workarounds. The professional sense of responsibility at work has thus spawned actions that positively influence organizational agility with customer satisfaction, which is more assured.

To formalize our findings more carefully, we now present a high-level research model (see Figure 1) that is developed both inductively from our research data and deductively from the relevant literature. The model is centered around *zerengan*, the sense of responsibility that constitutes the key research contribution, because this was
the single most frequently mentioned concept in our interviews. We identify *zerengan* explicitly as an instance of a mental state associated with OCB that mediates the links between key antecedents (the inadequacy of various aspects of the organization’s IS environment, the employee’s guanxi orientation, and the employee’s moral perceptions) with the way employees undertake their work in the organization. We must note that given the way we orient this research model around the unique position of *zerengan*, it only captures a partial view of the overall working environment for which we collected evidence, whether through literature review or interview data. In consequence, we do not intend to say that the research model represents an overarching framework that delineates all the permutations and interactions involving the various antecedents, *zerengan*, and other mental states associated with OCB, and the IS-related OCB actions that are taken by employees in the organization.
5.1 Systemic Inadequacies

The IS literature is replete with examples of inadequate systems. These include software that does not support employee work requirements and inadequate training opportunities (Wong et al. 2005; Ignatiadis and Nandhakumar, 2009; Alojairi et al. 2013; Alter, 2013). Meanwhile, a basic level of IT competence is essential for successful system use (Somers and Nelson, 2001). In this article, we conceptualize these systemic inadequacies as covering the software, training, and personal skill domains associated with the focal IS. In addition to the lack of system support for the current work process, in our interviews we noted a marked inclination to attribute weak performance to both, a poorly performing ERP software and an inadequate training regime in the organization. Several managers commented on the paucity of relevant training that led to employees failing to understand how to use the ERP correctly. Even on-the-job training appeared to be missing. In consequence, all problems were directed to the ERP practitioner for resolution. However, this proved to be an ineffective solution as, unlike the situation described in Deng et al. (2015), the ERP practitioner failed to teach employees how to solve their own problems, instead complaining about their laziness and criticizing their lack of attention to detail. When employees are hampered by systemic inadequacies in the operating environment, some seem to have the inclination to develop a stronger sense of responsibility to solve the problems. They do this by creating workarounds or helping each other, thereby addressing the problems in the work process and acting in the best interests of the organization and its clients. When problems arise, instead of blaming the inadequate system, we observe that these employees take the initiative to solve problems in a responsible fashion. Accordingly, we propose:

P1a: The inadequacy of an IS can trigger employees to develop a sense of responsibility for the organization and its clients.
P1b: The inadequate training in the use of an IS can trigger employees to develop a sense of responsibility for the organization and its clients.

P1c: The lack of basic IT skills and competence to use an IS effectively can trigger employees to develop a sense of responsibility for the organization and its clients.

5.2 Moral Influences

We detect two distinct forms of moral influence: “organizational loyalty” and “role models.” We group these together because, in the Chinese context, there is a moral dimension to each, as we explain below. The sense of loyalty reflects the internal value that an individual employee has for both the organization and the immediate supervisor (Chen et al., 2002; Hui et al., 2004). Meanwhile, the notion of role models captures the external influence that an individual employee feels with respect to his/her peers and superiors (Morgenroth et al., 2015).

Organizational loyalty is associated with the way employees identify themselves with and bear allegiance to both their leaders and the organization as a whole, essentially ignoring the self-serving interests of individuals, teams, and departments (Podsakoff et al. 2000). Organizational loyalty is closely linked with the sense of responsibility as it entails ensuring that the needs of the organization and its clients are met, “remaining committed to it even under adverse conditions” (ibid.).

In the Chinese context, loyalty to the supervisor and the organization are highly regarded (Chen et al., 2002; Hui et al., 2004), as they are indicative of conformance to principles of Confucian ethics (Farh and Cheng, 2000). Employees, particularly at senior levels, are expected to be loyal (Yeophantong, 2013). In our interviews, we observed that the more senior employees [e.g., S, W, X, and ZY], most of whom had developed their careers over many years with Hardware Systems, all exhibited a strong sense of both affection and loyalty to the organization. The finance manager [X] is typical, telling us: “I am loyal to my company, I feel responsible to it. When there is anything abnormal, we will investigate and find out the reasons to solve the problem. … I feel shameful if I do not do my job well. This is because I treat the company as my home.” Similarly, the warehouse manager [ZY] commented: “when there are things I can do to improve the efficiency of a job, I would do them. This is because we have the same goal, to produce products and ship them to our customers.” When the level of organizational loyalty is high, employees will be less concerned with the parochial interests of individuals, teams, and departments, instead developing a sense of collective responsibility for the organization and its clients. The sense of organizational loyalty was also reflected in one new recruit [M] who demonstrated a high level of sense of belonging to Hardware Systems, and the willingness to advocate a better operation of the company. We thus propose:

P2a: In the Chinese context, employees are normatively expected to be loyal to the organization, and thus will be more likely to develop a sense of responsibility for the organization and its clients.

The role model theory (Morgenroth et al., 2015) suggests that role models play an important role in “motivating individuals to set and achieve ambitious goals.” First coined by Merton (1957), role models “refer to individuals in specific roles … who serve as examples of the behavior associated with this role.” A key component of a role model is the inspiration that the individual provides for others. As Morgenroth et al.
(2015, p.475) explain: “inspiration leads individuals to adopt new or better goals or to think in new or better ways.” Furthermore, “inspiration is generally evoked by something outside of one’s own will, for example, a role model. Finally, inspiration leads one to want to strive toward these new goals.”

Admiration is an alternative mechanism that might explain how role models influence others (Schindler et al. 2013). According to Morgenroth et al. (2015), admiration is closely associated with desirability, which refers to the extent to which an individual “perceives a role model in a positive light, and … is likely to make a role aspirant want to be like the role model.” The intention to change oneself so as to be like another closely resembles the mimetic isomorphic tendency often associated with institutional theory (DiMaggio and Powell, 1983), and is salient in the current context because of the need to actualize the sense of collective responsibility into a specific workplace behavior. Two further drivers of this isomorphic change process are the moral value associated with the role model (Brambilla et al., 2011, 2012), and the notion of shared group membership (Shamir et al. 1993), which is very common in the Chinese context (Triandis, 1989). The moral dimension is central to the sense of responsibility: as noted elsewhere (e.g., Yeophantong, 2013; Farh et al., 2004), it is morally, even if not contractually, obligatory for role holders to demonstrate OCB. In consequence, other employees may find the sense of morality persuasive and so seek to emulate the role model’s behavior by developing the sense of collective responsibility. At Hardware Systems, some of the employees [A, X] are highly motivated by certain behaviors of the CEO, including her devotion to work, enthusiasm in life, and care for the employees. For instance, the financial manager (X) commented: “I worked for several companies before joining Hardware Systems, but this company makes me feel different. The CEO is the core of the company and she takes care of us in the company. This can be reflected in all sorts of details. She did a lot of things, both big and small. She might not notice this, but we (and I) have felt that and got inspired.” Although the term “moral role model” was not explicitly mentioned during the interviews, the motivation and inspiration by the CEO appears to have been influential to some of the managers, cultivating the sense of shared responsibility for taking care of the whole company and its customers.

P2b: In the Chinese context, moral pressures to conform mean that the presence of a moral role model will stimulate the employee to develop a sense of responsibility for the organization and its clients.

5.3 Guanxi Orientation

Guanxi is a ubiquitous construct in Chinese societies, including the workplace. A large number of subconstructs is associated with guanxi, notably interpersonal trust (xinyong), obligation (yiwu), reciprocity (huibao), and harmony (hexie) (cf. Ou et al., 2014). Guanxi orientation refers to the extent to which an individual recognizes, accepts, or applies these guanxi attributes (Yang, 1994). Prior research into OCB and organizational communication in China has mentioned guanxi as a lubricator of interpersonal connectivity. We consider that guanxi orientation and its components function as a moderator to influence the systemic inadequacy and moral perception on the formation of a sense of responsibility in the work context. When an employee advocates interpersonal trust, obligation, reciprocity, and harmony, it is more likely that s/he is willing to conform to the organization’s expectation to share the responsibilities of the company and its clients, even when the IS and the environmental conditions are inadequate and obstruct him/her from accomplishing the work. At the same time, if an
employee has a stronger guanxi orientation, his/her loyalty to the organization and the positive impact of role models will more likely be activated, thereby strengthening the relational climate and helping all work toward the collective goal. Meanwhile, employees with a strong guanxi orientation are also likely to want to adhere to a standard of professional responsibility in the workplace; hence, in addition to the moderated effects, we suggest the presence of a direct effect as well.

A number of employees referred to guanxi-related concepts. For instance, the planning manager [W] remarked: “I have worked in this company for 10 years. I think we don’t have a lot of conflicts, and we have a harmonious culture.” The material worker [SH] also commented on the harmonious relationships among employees, comparing them to a family. With respect to obligation, the sales supervisor [S] commented: “If colleagues are absent from work, their work must be replaced by someone else. We are comfortable to do the extra tasks without complaint.”

Hence, the presence of guanxi orientation can strengthen both preexisting organizational loyalty and the effects associated with systemic inadequacies. We thus propose:

**P3a:** If an employee has a stronger sense of guanxi orientation, systemic inadequacies will be even more significant in enhancing his/her propensity to develop a sense of responsibility for the organization and its clients.

**P3b:** If an individual has a stronger sense of guanxi orientation, his/her loyalty to the organization and reliance on role models will be more significant in driving his/her propensity to develop a sense of responsibility for the organization and its clients.

**P3c:** If an employee has a stronger sense of guanxi orientation, his/her sense of professional responsibility within the organization will be stronger.

### 5.4 From Responsibility to OCB

The prior literature has not formally associated the sense of responsibility with OCB. However, the perception that role-based responsibilities are obligatory by virtue of the social context where those roles are enacted, even as they are informal and implicit (Yeophantong 2013; Lu and Koehn 2015), suggests that responsible employees will seek to undertake their work in a way that at minimum complies with organizational norms, and that on occasion may exceed those norms. Senior employees are likely to be particularly sensitive to this implicit and noncontractual obligatory expectation and to respond in kind, given that the alternative is to face social ostracism (Yeophantong 2013) or even the loss of employment.

Our interviews with employees revealed a variety of different patterns in workplace behavior. Some junior employees shirked their workplace responsibilities, engaging in avoidance behavior, and seemed not to care that work should be undertaken following correct procedure. This was quite surprising given the normative expectation in the literature that Chinese employees at all levels should demonstrate loyalty to their superiors and their employer (Yeophantong 2013; Lu and Koehn 2015). We argue that this surprising result can be attributed to the lack of sense of responsibility. Other employees complied, as expected, with organizational norms as good citizens. A small number of employees performed at levels exceeding role norms and thus engaged in OCB. The most prominent forms of OCB included showing others how to use the ERP software [S, W, Y, and ZY] and undertaking unpaid overtime work at night so as to
complete the work of others [X], thereby protecting the interests of the organization and its customers.

In practice, the more innovative OCB behaviors focused on creating workarounds to solve problems. As already noted, the ERP software provided inadequate support for employee work in certain respects and some employees certainly experienced difficulties using it. This in part stemmed from the nonstandard operating environment at Hardware Systems where many one-off production situations occurred, each requiring a fresh setup in the ERP with a new BOM. The standardized ERP software is seldom this flexible, and so the responsible employees needed to create workarounds to resolve these issues.

Workarounds also extend to helping others. This was highlighted by the sales supervisor [S]: “When my colleagues need help, I help. This is not because we are close to one another, it is because of the sense of responsibility. ... Sometimes we should not just finish the jobs which are allocated by our boss, we should do our best within our abilities.” In a similar vein, the planning manager [W] observed: “I am still thinking of work after I leave the office; I would think how to arrange jobs, how to produce the products. There is a motivation [responsibility] driving me to make things better.”

In cases where senior managers took actions to help their colleagues far beyond the call of duty, we suggest that they were acknowledging their implicit yet mandatory responsibilities, behaving in accordance with the expectations that they perceived to exist for specific roles, and so acting as influential supervisors and leaders for junior employees in a positive way. We thus propose:

**P4: The strength of an employee’s sense of responsibility for the organization and its clients will influence his/her behavior in using the IS. Employees will create IS-based workarounds and changes to work processes, to solve problems in accordance with their sense of responsibility.**

### 6 Implications, Limitations, Future Research, and Conclusions

In this exploratory case study, we have investigated the way OCB is manifested in, Hardware Systems, a Chinese manufacturing SME in the specific context of ERP usage. While there are previous studies of OCB with respect to both ERP and Chinese organizations, we believe that this is one of the earliest to combine all three elements. Our separation of OCB into mental states and physical actions, which was stimulated by our analysis and of the way sense of responsibility (zerengan) plays a mediating role between various exogenous antecedents, and the IS-based actions that employees take to solve problems, is also novel in the OCB literature. While the organizational adoption and use of ERP software has been thoroughly explored in prior research, an assessment of the way ERP use is affected by OCB has hardly been touched upon. Indeed, since Hardware Systems is an SME, we suggest that the lack of organizational slack might highlight the importance of OCB in operating a business, as the onus of responsibility is all the more salient for employees. Finally, although the Chinese concept of *zerengan* has been studied previously, it has not been formally associated with the OCB literature.

A key criterion for OCB is that the behavior not be formally mandated or obligated in an employee contract. Our understanding of the way *zerengan* works is that it is entirely implicit and noncontractual, even as the individual senses that it is informally obligatory. The evidence we have presented suggests that this sense of responsibility
particularly applies to more senior employees, such as managers, which is consistent with the literature (Yeophantong 2013; Lu and Koehn 2015). Responsibility is normally commensurate with authority: more senior employees, such as managers, will feel a stronger sense of responsibility than their junior colleagues. Nevertheless, even junior employees can normally be expected to display at least minimal levels of compliance with organizational expectations, and so the instances of laziness and carelessness that we encountered were unexpected: such behavior is countercultural in the Chinese context. Given the limited evidence base in this study, we recommend that in future researchers investigate the prominence of zerengan as a phenomenon in a wider range of organizational settings. These future studies can also usefully explore the links between OCB and zerengan, not only among managers, but across the organizational spectrum. Indeed, there is no reason to suggest that zerengan should be limited to the Chinese context: it is plausible to imagine that in other cultural contexts some employees will demonstrate similar behavior in similar circumstances. However, the salience of zerengan might vary significantly in different cultures.

In addition to OCB, it is also important to highlight that three different dimensions of IS-related systemic inadequacy are identified in this study, relating to software, training, and IT skills. All three are related to the lack of resources that is common in SMEs such as Hardware Systems. Although a cross-case comparison is not immediately possible, we suspect that IS-related systemic inadequacies are rather common in SMEs. Thus, the conceptualization and articulation of these three dimensions of IS-related systemic inadequacies provide an important foundation for future research: we encourage further theorization of the concept of inadequacy in the IS discipline, as well as investigations into how IS inadequacies are related to workaround behavior (cf. Alter, 2014; Davison and Ou, 2018). We suggest that Hardware Systems’ systemic inadequacy problems are overcome by employees who draw on both their loyalty to the organization and their reliance on role models to develop a sense of responsibility, moderated by their individual guanxi orientation. The extant research on workarounds mostly focuses on technical solutions and their consequences (cf., Ignatiadis and Nandhakumar, 2009); however, the factors that contribute to the solutions remain underresearched. In this study, we have filled this gap, by integrating the indigenous cultural factors, namely guanxi orientation and zerengan, in a single model to explain the IS-related OCB phenomenon.

While the eternal problems of inadequate resources mean that an ideal technology environment may never be realized, practitioners should encourage the development of a sense of responsibility among employees. Employees who are loyal to the organization and their supervisors, and who find moral role models in the workplace, are more likely to develop a sense of responsibility for the organization and its customers, even when the technology environment is inadequate. Such responsible employees are more likely to engage in OCB, which will help to ensure that organizational objectives are met.

7 References


**Appendix: Interview Questions**

1. What is the ERP system most useful and most useless for? What can you not do with the ERP that you would like to do? Does the ERP system make your working life easier or harder? Why?
2. How do you solve these kinds of problems with the ERP system?
3. How do you become familiar with the system’s functionality? Did you do any training? Was the training helpful? Please explain.
4. Do others help you with the ERP system? How do you feel about this?
5. To what extent does guanxi affect the way you use the systems and help others? Do you have that sense of guanxi with your fellow employees or with Hardware
Systems as a company or with the customer? Do you feel a need to develop or maintain those feelings?

6. You are a [job title]. In this role, do you have a sense of implicit moral obligation or responsibility to perform OCB? Please explain.

7. Do you help others to use the ERP system? For example, when they are sick or overloaded or too busy? How and why? Why do you think they need help? Is this a temporary problem or a long-term situation? What steps should management take to resolve the issue?

8. Please describe the culture of Hardware Systems. How does the organizational culture affect how work is done?