Understanding Customer-Oriented Organizational Citizenship Behavior in Information System Support: An Exploratory Study

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Abstract
Organizations increasingly rely on information system (IS) professionals to facilitate end-users’ effective use of information technologies. Focusing on IS post-adoptive support and drawing upon organizational citizenship behavior (OCB) theory, this study seeks to understand IS professionals’ customer-oriented citizenship behavior, discretionary behavior that would greatly enhance customer service quality in IS support context. Analyzing 300 support service interactions at three points in time and with two applications, we identified five categories of customer-oriented citizenship behavior by IS support personnel, including anticipation, education, justification, personalization-technology and personalization-business. Moreover, different types of OCB were found dominant across three periods, starting with the justification OCB and gradually shifting to anticipation and education OCB. Results from this study demonstrate the value of customer-oriented citizenship behavior in IS context. Our findings contribute to the literature on IS post-adoptive use and provide organizations a useful guideline for enhancing IS service quality.

1. Introduction
For organizations to realize the promised benefits from their information system (IS) investment, employees in the organizations must be able to adapt the installed technologies into their work routines. IS professionals in post-adoptive support have been playing an important role in assisting organizational end-users with their technology use (e.g., [3, 13]). In this regard, IS professionals are considered as customer service providers rather than developers of technical products. As a result, understanding the drivers to effective customer service of IS support personnel has a potential to generate new insights into promoting and sustaining end-users’ technology use. IS literature has implicitly examined the customer-orientation behavior of IS support professionals, such as building interpersonal relationships with business users to offer personalized service [3] or acquiring business domain knowledge to better serve end-users’ information needs [13]. Although insightful, it remains unclear what customer-oriented behaviors IS professionals demonstrate during their IS post-adoptive support work and how those behaviors evolve over time.

In this study, we draw on insights from literature on organizational citizenship behavior (OCB) and investigate the customer-oriented behavior of IS professionals. Organizational citizenship behavior is defined as a discretionary behavior that promotes the effective functioning of an organization but is not part of a formal job description [12]. For example, when one team member offers to help a newcomer learn how to perform a specific team task, the team member demonstrates an OCB. Nielsen et al. [11] reviewed the studies on employees’ OCB at the individual level and within groups, and concluded that OCB enhances coworker productivity and organizational performance. Likewise, when IS support personnel demonstrate those extra-role helping behaviors that are not prescribed in their job descriptions nor explicitly requested by their customers (end-users), those IS professionals are likely to enact an OCB in their provisions of IS support services. As predicted by organizational scholars (e.g., [12, 14]), these extra-role behaviors will exert a positive impact on the performance of end-users. To this end, examining OCB occurrences in IS support will provide valuable implications for both IS research and practice.

In this study, we intend to examine the presence of customer-oriented OCB in IS support service, and to develop a categorization schema of OCB in IS post-adoptive support. In particular, we compare and contrast the support services in a real organizational setting for two applications across three time periods so as to understand the evolution patterns of IS professionals’ OCB in technology support. We hope that both the OCB categorial schema and the generic model will provide IS management with useful guidance for promoting customer services and for building strong relationships between business users.
and IS personnel in organizational support of technology use.

The remainder of the paper is organized as follows. We start with reviewing studies on IS post-adoptive support and on organizational citizenship behavior. Then we present the research methodology for undertaking this investigation, describing our research site, data collection and analysis. We present the results with illustrative examples, and discuss the theoretical contribution and practical implications of the research. The paper concludes with directions for future research.

2. Theoretical background

2.1. Knowledge challenges in IS support service

During the post-adoptive use of information system, individuals begin to actively learn about and utilize technology applications. They may encounter problems which, if unresolved, prohibit their continued and extended use of the applications. Each request by an end-user for information or for problem solution at any point in time reflects a knowledge barrier that the end-user encounters in his or her technology use. For example, knowledge barriers have been documented in the post-adoptive use of enterprise resource planning (ERP) technology, preventing end-users’ effective use of the enterprise technology [1, 21]. System use problems, if unresolved, could result in individual productivity loss [4] and negatively affect organizational performance [20].

In IS post-adoptive use, IS support departments become one major channel to facilitate end-users’ employment of those newly-implemented information technologies. For example, Santhanam et al. [23] identified different types of knowledge flows between IS support personnel and end-users such that technical knowledge flows from support personnel to business users while business domain knowledge flows in the opposite direction. Pawlowski and Robey [13] found that, in addition to technical knowledge, IS professionals in the support context were able to pass good practices of technology use from one user group to another, playing an important knowledge brokering role. Das [5] studied the software support by vendors and suggested that matching problem resolution strategies with the nature of problem-solving tasks resulted in timely resolution of system use problems, improving the productivity of support operations. The limited studies on IS post-adoptive support highlighted the importance of knowledge sharing and service responsiveness in enhancing client organizations’ use of the installed technologies, but they did not focus on the customer service aspect of IS support. The provision of quality service is growing in importance in information system field, as shown in the development of service quality scales in the IS field [3]. One useful theoretical lens for studying effective customer service is the extra-role behavior by a service provider. In this regard, we draw upon literature on organizational citizenship behavior for further insights.

2.2. Organizational citizenship behavior (OCB) and customer orientation

Organizational citizenship behavior (OCB) has been well-studied by organizational scholars during the last two decades. OCB was originally defined by Organ [18] as employees’ behaviors that are discretionary and not directly or explicitly recognized by organizational reward systems. In other words, those behaviors are not part of a formal job description [12]. Helping a new co-worker with work-related problems and showing good sportsmanship in teamwork are both examples of OCB. Research in this field suggests that both teams and organizations benefit when employees engage in extra-role behaviors that go beyond the job requirements specified in their employment contract [11, 14]. In the instances of the extra-role behaviors extended to new co-workers or to team members, the former is likely to lead to improved productivity for the work unit, while the latter may enhance the moral of the team.

However, Podsakoff and colleagues [15] reviewed literature on OCB and acknowledged the academic debate in the literature over the distinction between an in-role and extra-role behavior. Is a citizenship behavior in fact distinct from an in-role behavior (expected from a formal job description)? According to the review, both employees and managers have difficulty in recognizing the distinctions between in-role behaviors (expected job responsibilities) and extra-role behaviors (discretionary, organizational citizenship behaviors). On the one hand, employees may consider particular behaviors “expected” as part of their job, even though those behaviors are not formally rewarded by their employer organizations. This may be due to employees’ perceptions that they are expected to make their best efforts to contribute to the effective functioning of the organizations. On the other hand, managers may take all those efforts (whether required or not) for granted when evaluating the performance of the employees. The difficulty and confusion in distinguishing in-role from extra-role behavior necessitate further theoretical development of the OCB construct.

One appropriate context for the further conceptualization of OCB is the service sector, i.e., IS support service, where service providers’ OCBs are
critical to customer service quality. Prior studies have highlighted the importance of OCBs in customer service provision. For example, Podsakoff and MacKenzie [14] described the concept of customer-focused OCB and referred it as employee behaviors in serving customers’ interests and needs beyond their job specification. Similarly, marketing researchers have emphasized the role of customer orientation in service workers’ performance, and defined the concept as “an employee’s tendency or predisposition to meet customer needs in an on-the-job context” [2]. The two concepts share a common focus on customer service orientation. Similarly, the support service of information technology involves responding to end-users’ requests for information and solution to facilitate their technology use. Customer orientation has become an important factor in improving the image of IT departments [3]. In this study, we adopt the term “customer-oriented OCB” and define it as “employees’ discretionary behaviors in serving customer interests and needs not explicitly requested.”

In summary, the conceptualization of customer-focused organizational citizenship behavior provides us insights into understanding the extra-role helping behaviors of customer service employees in the service sector, yet the conceptualization of OCB needs further development. In this study, we view IS support personnel as customer service providers, and aim to categorize customer-oriented OCBs emerging in the service interactions between support personnel and end-users of information technologies.

3. Research methodology

3.1. Research site

The research site is an organization (referred to as the “Institution”) in the northeastern region of the United States. In January 2007, the Institution successfully implemented a Human Resources/Payroll (HR/Payroll) Management application and a Supplier Relationship Management (SRM) application, two common components of the enterprise system SAP/R3. A centralized support center, the SAP Support Center, was set up by the Institution to support 11,000 employees (end-users) with their use of the newly-implemented technologies during the first 12 months (April 2007 –April 2008) post implementation. In this paper, we view the end-users of the two applications as “customers” and the IS professionals at the Support Center as “customer service provider.” The study reported here focuses on the service interactions between IS support personnel and end-users at the Institution.

End-users at the Institution started to employ the new systems to perform their work tasks in April, after initial trainings during the three months (January – March 2007). The end-users contacted the SAP Support Center for assistance when they requested system-related information and/or experienced problems with their system use. The majority of customer service requests were called in, while about 25% to 30% of the requests were submitted via e-mails. Both emailed and phoned requests were logged in the Support Center’s ticket tracking database with details of each interaction, including details of the customer contact information, support service requests, the assignment of support personnel, and the response/resolution for service requests. There were three levels of support personnel at the SAP Support Center: front-liner, specialist, and developer. Frontliners were the level 1 support where a front-line analyst received end-users’ calls and emails, logged them with unique ticket numbers, and then assigned them to specialists (level 2) at a functional team: HR/Payroll or Supply Chain. When the level 2 specialists could not address a request or resolve a problem, they passed it to the development team (level 3) for system modification and enhancement. Among the three levels of support, specialists at level 2 were the main knowledge source to directly address end-users’ requests with regard to the SAP/R3 system use. Hence, this study focused on the level 2 specialist (referred to as “support personnel”), and examined their service interactions with end-users.

The Support Center emphasized the service quality of the IS support personnel, and monitored their service performance in addressing customer requests. Similar to the commonly used measures adopted by traditional call centers and help desks [5, 16, 17], the management at the Support Center routinely calculated the total number of tickets closed by a support person in a week, the ratio between closed and open tickets, and the weekly ticket closure ratio on Fridays. As the Support Center was one major knowledge source in facilitating end-users’ learning of the implemented technologies, the management emphasized the quality of customer service in each service interaction between IS support personnel and end-users. Meanwhile, the management admitted that it was difficult, if not impossible, to measure the quality of the support service in each individual customer interaction, even though descriptive texts of the service encounters were available in the database records.

3.2. Data collection

Our main data source was the archived ticket records extracted from the ticketing database of the
Support Center. We randomly sampled 300 ticket records for three time periods, April 2007, October 2007, and April 2008, which were six months apart. Doing so allowed us to examine if the key variable of our interest, the customer-oriented OCBs, varied across different time periods during the critical one-year window of user learning post implementation. Our sample contains data on the support activities with regard to the two applications of SAP/R3, the HR/Payroll and SRM system. Each ticket record included data on a customer’s request, its categorization and assignment, and the details of service provision and problem resolution.

In addition, we collected information about the SAP support operation through interviews and documents. We conducted a total of five interviews with support center managers and specialists in December 2007 and March 2008 for additional insights about the IS post-adoptive support environment. We asked open-ended questions about their experience with post-implementation support, including the types of problems encountered by organizational end-users, support staff’s resolution strategies, and challenges in helping end-users learn to use the new systems. Each interview lasted forty-five to seventy-five minutes. Insights from the interviews are used to supplement our data analysis.

3.3. Data coding and analysis

Before we identify extra-role (OCB) behaviors, we need to understand the expected in-role behaviors in the customer support context. The expected behaviors of a customer service employee cover a broad range. Main job responsibilities in call centers include responding to customer inquiries, providing customers with product and service information, handling and resolving customer complaints, and researching required information using available resources [5, 6]. According to Call Center Helper, a popular call center magazine in the United Kingdom, call center employees are evaluated by a number of generic measures, including overall volume of calls handled, percentage of calls abandoned, and average call duration time [19]. All of those performance measures focus on the efficiency of customer interactions, e.g., total count of calls and response time. For extra-role behaviors in this context, we focused on the effectiveness of customer service interactions. Consistent with Rafaeli et al. [16], we defined instances of customer-oriented OCB as "instances of services during which support persons offered customers assistance that was not explicitly requested by the customers, but that could promote effective customer service."

To identify instances of OCBs, we carefully reviewed the extracted 300 ticket records of end-user requests. As our research interest was in the customer-oriented behaviors of those IS support personnel, we primarily focused on the support persons’ written description of their activities undertaken to address end-users’ information needs and to resolve end-users’ system use problems. However, because the job responsibility of the IS support function was to assist end-users with their system usage, responding to end-users’ explicit requests and resolving the problems that end-users reported should not be considered as an instance of customer-oriented OCB. In this regard, there was a need to review the descriptive texts of end-users’ requests so as to fully understand the context of each service interaction and to determine if a support person’s helping behavior exceeded the explicit request made by an end-user. When coding the OCB instances, we followed the generic guideline by Podsakoff and colleagues [15, p.549] that an OCB behavior is not (1) an explicit part of job description; (2) something the support personnel were trained by the organization to do; and (3) a behavior that formally and explicitly rewarded when exhibited, and punished when not exhibited.

We adopted a two-level coding strategy [9]. First, we reviewed both service requests by end-users (e.g., problem description) and activities by support personnel (e.g., problem resolution) to identify the instances of extra-role behaviors. Both authors determined the coding scheme together, performed a pilot coding on 40 episodes (20 on the HR/Payroll application and 20 on the SRM application), and discussed the coding results. Then, from reviewing prior studies on OCBs, we compiled a list of customer-focused OCB categories (such as anticipation, education, and emotional support). The definitions of the OCB categories and examples are provided in Table 1. Based on a review of studies on system usage problems, we compiled a list of end-user request categories, including types of information requests (technical “know-what”, “know-how”, and “know-why”) and system use problems (i.e., system generated information, technical functionality, and workflow control). For example, “Error in Document xxx Period 007 Not Open for Posting” was categorized as a functionality issue and the user would like to know why this was the case. “What happens to the paid hours when the retroactive reassignment is processed?...the Business owners xxx need to follow procedures for retro processing...” was a workflow problem and the user would like to know how the reassignment would be processed. According to the modified coding scheme, both authors independently coded the remaining 260 records of service interactions. Then we
performed the second-level coding, the pattern-coding, during which we summarized themes related to each service interaction. The themes were identified from prior literature and from those emerging from the initial analysis.

Data coding and analysis were conducted iteratively between the examination of the data and the development of theoretical interpretations. Initial data analysis focused on understanding the customer service behaviors of the support personnel during information system support. As discussed earlier, we would like to know whether the support personnel provided additional information beyond end-users’ explicit requests. When an OCB instance was identified in a service interaction, we coded it as “1” for the presence of customer-oriented OCB.

The inter-rater reliability is measured by Cohen’s Kappa index [8] which ranged between 0.835 and 0.938 for system use problems and tasks. The inter-rater reliabilities of coding the dummy variable OCB and different categories of OCB are also high (Cohen’s Kappa Index of 1.000 and 0.958). This suggests an acceptable level of agreement between the two coders [22]. When a coding discrepancy exists, the two coders discussed the coding and resolved the discrepancies.

Overall, 94 instances of OCBs were identified from the 300 service interactions. Each instance represented a manifestation of extra-role helping behavior by IS support personnel. We further categorized the customer-oriented extra-role behaviors into five different groups, including (1) anticipation, (2) justification, (3) education, (4) personalization tailored to business domain, and (5) personalization tailored to technical system. Table 2 provides the frequency distribution of OCB instances by the two technical systems across the three time periods. Meanwhile, Table 3 provides the frequency distribution of the five categories of OCB across the two technical systems.

Table 1. Illustration of the Coding Scheme of OCBs

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0) None</td>
<td>No OCB instance identified.</td>
<td>“Educated or trained the customer as to the correct procedure”</td>
</tr>
<tr>
<td>(1) Anticipation</td>
<td>Anticipating customer requests (sharing consequence/next action).</td>
<td>“…Told xxxxxx what to do to update the document, and how to send it into Workflow. Also advised her what to do if document doesn’t allow changes.”</td>
</tr>
<tr>
<td>(2) Justification</td>
<td>Offering explanations and justifications (additional info on why problem occurred).</td>
<td>“The specified application had an incorrect configuration setting…Changes were made to the WSR for Executives. The configuration changes impacts the function PART, which determines the partial period salaried amount.”</td>
</tr>
<tr>
<td>(3) Education</td>
<td>Educating the customer.</td>
<td>“…customer had a question about parked document. I gave the customer a walkthrough of how to get a parked document into workflow.”</td>
</tr>
<tr>
<td>(4) Personalization-Business</td>
<td>Offering personalized information/solution on business processes and rules.</td>
<td>“…requesting the Fund number which was missing from the xxxxxx Create ISR…xxx will enter the ISR#4xxx information, plus Fund, into SAP, which creates the position that needs to be filled for an employee starting today…”</td>
</tr>
<tr>
<td>(5) Personalization-Technical</td>
<td>Offering personalized information/solution on technical features.</td>
<td>“…Employee #4xxx error in Batch 11 due to incorrect Birth date on IT0002. Date was the same as hire date. HR shared services has corrected so batch was re-run and employee was able to be paid.”</td>
</tr>
</tbody>
</table>

Table 2. Frequency Distribution of OCBs by Application and Time Period

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Freq. (%)</th>
<th>OCBs</th>
<th>Non-OCBs</th>
<th>OCBs</th>
<th>Non-OCBs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>HR/Payroll Application</td>
<td>SRM Application</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OCBs</td>
<td>Non-OCBs</td>
<td>OCBs</td>
<td>Non-OCBs</td>
</tr>
<tr>
<td>Period 1: 2007-04</td>
<td>100 (33.3%)</td>
<td>21 (44.7%)</td>
<td>29 (28.2%)</td>
<td>13 (27.7%)</td>
<td>37 (35.9%)</td>
</tr>
<tr>
<td>Period 2: 2007-10</td>
<td>100 (33.3%)</td>
<td>16 (34.0%)</td>
<td>34 (33.0%)</td>
<td>16 (34.0%)</td>
<td>34 (33.0%)</td>
</tr>
<tr>
<td>Period 3: 2008-04</td>
<td>100 (33.3%)</td>
<td>10 (21.3%)</td>
<td>40 (38.8%)</td>
<td>18 (38.3%)</td>
<td>32 (31.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>300 (100%)</td>
<td>47 (100%)</td>
<td>103 (100%)</td>
<td>47 (100%)</td>
<td>103 (100%)</td>
</tr>
</tbody>
</table>

Table 3. Frequency Distribution of OCBs by Application and Category

<table>
<thead>
<tr>
<th>OCB Category</th>
<th>Freq. (%)</th>
<th>HR/Payroll Application</th>
<th>SRM Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Anticipation</td>
<td>41 (43.6%)</td>
<td>21 (44.7%)</td>
<td>20 (42.6%)</td>
</tr>
<tr>
<td>(2) Justification</td>
<td>20 (21.3%)</td>
<td>14 (29.8%)</td>
<td>6 (12.8%)</td>
</tr>
<tr>
<td>(3) Education</td>
<td>17 (18.1%)</td>
<td>2 (4.3%)</td>
<td>15 (31.9%)</td>
</tr>
<tr>
<td>(4) Personalization-Business</td>
<td>8 (8.5%)</td>
<td>6 (12.8%)</td>
<td>2 (4.3%)</td>
</tr>
<tr>
<td>(5) Personalization-Technical</td>
<td>8 (8.5%)</td>
<td>4 (8.5%)</td>
<td>4 (8.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>94 (100%)</td>
<td>47 (100%)</td>
<td>47 (100%)</td>
</tr>
</tbody>
</table>
4. Results

Our data analysis revealed five major categories of customer-oriented OCB, including anticipation, justification, education, personalization-business, personalization-technical. First, anticipation OCB means that the support personnel provided additional information to customers because the support personnel anticipated the need of such information. Second, justification OCB occurred when additional information was given to justify the delay of a service response. Third, education OCB refers to extra helping behavior in educating end-users. The fourth and fifth OCB refer to the customization of information and solution provided to end-users regarding business domains and the installed technologies respectively. Next, we first elaborate on each type of behaviors. Then we compare and contrast the occurrence of OCBs in supporting the two different technical systems. Finally, we present the patterns of the OCBs across the three time periods.

4.1. Customer-oriented OCBs in IS support service

Anticipation OCB. The first category of OCB, anticipating customer requests, involves providing customers with information that customer did not explicitly request, but was directly related to the reported problems. For example, when a customer requested an update on the percentages in the federal work study (FWS) table in the HR/Payroll application, the support person did the update as requested, and offered further information that “FWS percentage changes moved to production. List of 32 personnel numbers (for 32 employees) affected sent to payroll for retro processing.” In this case, the customer did not inquire into the number of work study employees’ payment affected by the updated percentage. However, the support person provided the customer with the information on the consequence of the “update” in the system, and assured the customer that the retro processing of those employees’ payroll had been performed. Both pieces of additional information will be needed by the customer later.

In another example, when a customer made an inquiry about the status of the travel documents he submitted in the SRM system, the support person explained that “There are a few days between the time that Accounts Payable (AP) approves a document and the time that Finance actually gets the (dollar) amount into your hands.” In addition, the support person took an initiative to process (launch) a workflow action on behalf of the customer, as evidenced in the following record,

{"The customer also asked about the lack of workflow for trip # 1xxxxxxx for personnel # 1xxxx. The user (xxx xxxx) had not submitted the trip into workflow - I arranged for it to be launched (I launched it myself!)”}

Justification OCB. The second category of OCB, the justification behavior, is demonstrated especially when a customer’s request(s) cannot be fulfilled immediately. For example, a payroll employee questioned why the overstatement of vacation hours and sick leave balance for a union employee had not been resolved in the HR/Payroll application. The support personnel first explained how the overstatement issue affected entire business group, and then offered a justification on why the problem on individual records could not be resolved immediately. This extra-role behavior is evidenced in the record,

{"For personnel # xxxx, the record of vacation was locked by me and when TE runs it will fix her overstated balance. The (vacation) maximum issue is global for the xxx group and not individual. I am in the process of working this issue.}

In this service interaction, the support person illustrated the interdependence of data (e.g., vacation hours) and processes (updating the data of vacation hours) embedded in the technical system; correcting an individual piece of the data (e.g., overstatement of vacation hours for a union employee) required updating the data for the entire group of users. In response to the customer’s request, the support person could simply indicate that he was working on the issue and could provide an estimated timeframe on the completion of the update; he was not required to offer the details of problem causes and resolution process. In this case, by providing a “visualized” picture of the problem resolution process, the support person helped the end-user understand how his request was being addressed “behind the scene.” As a result of this justification OCB, the support person not only provided customers with “know-how” knowledge but “know-why” knowledge regarding their technology problems [23].

Education OCB. A third type of OCB, educating the customer, refers to the hands-on training of technical features and ensuring customers’ learning of the features. Often times, a support person would walk a customer through every step in completing a business task enabled by the system, and confirmed that the customer could perform the task without errors. In the following example, when a customer requested
assistance with displaying payment requests in the SRM application, the support person took the initiative to ensure that the customer fully understood the detailed procedure, as reflected in the record below,

"(I assisted with) Education and resetting of display. (Customer) got message that G/L (general ledger) account not good. We (the support person and the customer) checked G/L and it was good. Then we checked the vendor number, and it was a 4xxx number. We found a 2xxx number. That did it. I walked her through saving as complete. Her system lost the doc, so we did it a second time. Workflow didn't display properly. She didn't know her approvers. We located her approvers and fixed the workflow display. (It) Was a 1 hour phone call."

As a result of the walk-through training, the service request, which normally took 15 minutes to complete, lasted one hour in this case. In the context of IS support service, informing and educating end-users with regard to their technology use are listed in their formal job responsibilities. IS support personnel are expected to transfer their technical knowledge to end-users [23]. However, when a support person not only trained the customer about the correct procedure in employing the SRM system but also took extra steps to ensure that the customer was correctly employing the technical feature to perform a business task (e.g., payment request) without errors, an education OCB was demonstrated, as shown in the example above.

**Personalization OCBs.** The *fourth* category and *fifth* category refer to providing information and solution customized to customers’ business domains and to technical features respectively. To perform both types of personalization citizenship behavior, support personnel needed to rely on detailed input about a customer’s request, before they were able to offer information and resolution tailored to those incidents of system use problems. In one example of using the SRM, when an end-user made an inquiry about a payment request from a research grant, the support person took the initiative to contact another group to get more details specific to that grant account and to offer personalized information about the account billing. The personalization OCB is evidenced in the following record,

"(I) Talked to Finance source in the Help Desk area. Any G/L (general ledger) acct. # beginning with a 3, as Mary’s is, is an equity account, and should not be used to pay bills of this sort. (I) Suggested a G/L acct. # beginning with a 6."

Sometimes, support persons provided end-users with customized solutions to a system feature. This category is related to the concept of offering workaround solutions with implemented technologies [1]. The focus in this case was to offer customers a workaround solution when the required feature was not available in the installed technology. As shown in the following example, customers needed to apply different deductions for two different events, union due vs. political action fee, which were not available in the HR/Payroll system. The support person thus did some research and proposed the following workaround solution,

"(I) created two BW (business warehouse) reports (1) Union Dues (2) Political Action, and attach them to the two checks and mail with a note that in the future the deductions will be on separate checks with separate reports, as they (customers) requested."

As discussed above, IS professionals in the support context did demonstrate customer-oriented extra-role behaviors, which exceeded customer expectations and enhanced customers’ learning and utilization of the newly-implemented technologies. Some categories of OCB identified in the IS support service, such as anticipation, education, and justification, have been identified in the traditional customer call centers of financial services [16]. However, data analysis of the service interactions in IS support showed that the complexity of the integrated technologies (e.g., HR/Payroll and SRM) and the dynamics in end-users’ interactions with the technologies presented more knowledge challenges to those IS support personnel. In other words, IS support personnel must equip themselves with comprehensive knowledge about both the implemented technologies and the data and processes of customer business domains. Moreover, IS support personnel should develop a competence in understanding the details of customer requests and problems so as to offer workaround solutions (personalization to the business or to the technology) to cope with the deficiency of technical functionalities. Our data analysis revealed the two personalization OCBs, one tailored to business domain while the other focusing on technical features. Further, the support services of the two different technical systems entailed different patterns of OCBs, which we will present next.

### 4.2. OCBs in supporting two technical systems across three time periods

The two components of SAP/R3 system, the Human Resources/Payroll (HR/Payroll) Management system and the Supplier Relationship Management (SRM) system, are developed to support different business functions and are associated with different types of business users. First, the HR/Payroll system
manages employee personal and position-related information, and facilitates the processing of payrolls. Users of the HR/Payroll system are mainly HR/Payroll specialists working at HR and accounting departments. Managing personal benefits and payroll processing involves complex business policies and rules. As shown in the example of employee vacation hour overstatement, customers were familiar with their business domain, but needed to understand why the technical system did not generate the correct data (e.g., vacation hours) as they expected. The justification OCB greatly enhanced customers’ understanding of the data updating process enabled by the technology.

As shown in Table 2 and 3, more OCBs were observed in the support services of the HR/Payroll application during the first time period. Moreover, among the OCBs identified, most OCB instances were associated with justification (in Time 1), followed by anticipation and education (as in Time 2 and 3), as reflected in Figure 1. One explanation for the increasing importance of anticipation and education was that, support personnel had accumulated knowledge about HR/Payroll employees’ commonly-raised information requests and problems so that they could offer further information or perform personalized training in anticipation of HR/Payroll specialists’ future needs.

As discussed above, the support services of both the HR/Payroll system and the SRM system were challenged by new technical features introduced and the integrative business processes enforced in the HR/Payroll and SRM systems. However, the two systems differed in the extent to which they involved complex business policies and rules, and to which they engaged multiple parties in completing a business task. While the HR/Payroll system was internally-focused and more data-driven, the SRM system involved external vendors and the delivery of physical goods. Thus, the information and problems that end-users needed assistance with varied between the two systems and required different levels of assistance from IS support professionals, making them suitable contexts for us to compare and contrast the customer-oriented citizenship behaviors by IS support personnel.

5. Discussion

In this study, we identified five categories of customer-oriented extra-role behaviors in the IS support context, from analyzing 300 service interactions between IS support personnel and end-users over three time periods and by two technical applications. Extending prior studies on customer-oriented OCBs (e.g., [16]), our study identified two types of personalization OCB specific to the IS support context, the personalized OCB regarding business domains, and the personalized OCB tailored to the underlying technical features. Moreover, different types of OCB required different levels of competence from the support personnel. For example, anticipation OCBs would rely on the support personnel’s accumulated experiences in handing similar problems such that they could anticipate the consequence of a corrected action in using the technical system. This was evidenced in the case of updating the federal work study (FWS) tables for payroll processing. In the case of business personalization OCB, such as in helping to resolve Mary’s equity account problem, the support person not only needed a solid knowledge base of the business processes and the technical functionalities, but also the problem diagnosing and solving capabilities. These suggest that antecedents of OCB should consider individual capability, in addition to intrinsic motivation and organizational commitment [15].

Occurrences of OCBs evolve over time. Our data analysis revealed that during the early time period,
more OCBs were manifested in supporting customers’ use of the HR/Payroll application, but the number of OCB instances in the SRM system support exceeded those in the HR/Payroll application during the third time period. This finding suggests the importance of recognizing the temporal pattern when examining the occurrences of OCBs. Moreover, different types of OCBs were found dominant across the three time periods, starting with the justification OCBs and gradually shifting to anticipation and education OCBs. This suggests that the experience and competence of the service providers (e.g., IS support personnel in our case) have a potential impact on the types of OCB demonstrated. For example, as support personnel accumulated experiences in addressing error messages regarding the “3-way match” rule in the procurement process, they were more likely to offer anticipation and education OCBs after repeatedly addressing the same or similar customer requests.

Our data analysis also suggests that customer-oriented OCBs are not costless; OCBs cost additional time and effort from service providers. As reflected in the example of one-hour call on G/L account display and setting, more time was spent on hands-on walking a customer through system functionalities and making sure the customer fully understood the system features. This finding is consistent with those from the study of financial customer service: Customer calls longer than 3 minutes witnessed more occurrences of OCBs than shorter calls [16]. While OCBs have a positive impact on customer service quality, they may increase the time spent on each service interaction, reducing the efficiency of support service. Hence, it remains an open and interesting question to investigate the optimal balance between service effectiveness (e.g., the demonstration of OCBs) and efficiency (e.g., time spent on customer interactions).

6. Contribution and Implication

Our study contributes to the OCB literature in two ways. First, our study developed a multi-facet conceptualization of OCB by identifying OCBs in IS support services and organizing them into five categories. Each type of OCBs required different levels of providers’ initiatives and effort. Moreover, the enactment of each type of OCBs demanded different level of competence and expertise, ranging from knowledge about the technical products and business domains to expertise in problem-solving and diagnosing. Second, our study discussed the temporal nature of OCB. The IS service providers’ practice of OCBs evolved over time as a result of adapting to end-users’ changing requirements and improved learning.

Results of this study also contribute to IS research on post-adoptive use and support. Prior studies on IS support have investigated the types of knowledge transferred between IS support personnel and end-users [23] and suggested that matching support tasks with resolution strategies would enhance the productivity for IS support professionals [5]. By focusing on the customer service side of IS support, our study contributes to the literature on IS post-adoptive use by identifying IS professionals’ customer-oriented behaviors that would greatly enhance end-users’ learning and use of new technologies.

Practically, our findings on the customer-oriented OCB and its evolving patterns provide a useful guideline to IS support departments and personnel on how to enhance IS service quality via those extra-role behaviors. The additional helping behaviors will be especially important for those frustrated end-users whose work tasks were delayed due to their use problems with a technical system. Studies on end-user frustration suggest that a good strategy in improving IS use is to “bridge the gap between what user know and what they need to know, thereby leading to more successful, less frustrating user experience” [4, p.336]. By offering the customer-oriented OCBs, IS support personnel were able to anticipate what end-users need to know in the future and thus to provide them with the relevant information and knowledge, reducing the likelihood of having similar service requests or problems in the future. In this regard, organizations can enhance their information system support services by designing support services around the needs of end-users [10]. In the meantime, as OCBs were found to cost employees more effort and to require competence and expertise, organizations need to incorporate the customer-oriented OCBs in their development and implementation of reward and incentive policies. In the long run, OCBs are expected to enhance end-users’ technology usage, leading to improved individual productivity and organizational performance.

7. Conclusions and Future Research

Findings from this study demonstrate the value of collecting secondary data at multiple points in time to investigate customer service interactions of IS professionals in discovering the evolving patterns. The findings not only advance our understanding of critical customer-oriented behaviors in supporting the HR/Payroll and SRM applications, but also provide a good basis for large-scale empirical investigations of IS professionals’ customer services in supporting a variety of emerging information technologies.

This research was conducted in an organizational context in the United States, which may limit the
extent to generalize the research findings. Future research can be extended along several directions. First, our dataset from the ticketing database mainly reflected the service records made by IS support personnel. Customers (end-users) may have different counts of the same service interactions and may perceive OCB differently [15]. A further investigation of IS support personnel’s customer-oriented OCB should also adopt the assessment of OCB by customer side. Second, our study suggests the temporal pattern of OCB. A large-scale empirical study of multiple IS support organizations will validate our initial findings in this study and enhance our understanding of the dynamic patterns in the interplay between the categories of OCB and customer service quality. It is a long-term organizational goal to achieve the maximum benefit of IT investment. By highlighting the customer service aspect of IS support, our study shows a promising and value-added source for promoting organizational IT usage and for achieving that goal.

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9. References