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### Going beyond transactions

Beckers, Sander Floris Marie

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# 4

## HAPPY USERS, GRUMPY BOSSES: HOW B2B CUSTOMER SUPPORT CHANNELS IMPACT USER AND UPPER MANAGEMENT SATISFACTION<sup>12</sup>

### ABSTRACT

Due to new technologies customer support is evolving from traditional one-to-one support (i.e., service requests) towards one-to-many passive (i.e., online knowledge consultation) or active (i.e., active support community usage) web-based support. We investigate the impact of customer usage of a supplier firm's support channels on firm level satisfaction within a business-to-business (B2B) context. These B2B networks often have multiple layers within one organization, as the individual who uses the customer support is often distinct from the individual(s) responsible for purchase decisions. Therefore, we take service support research beyond the individual user and investigate how both users and upper management value the various ways their organization obtains customer support. Results indicate that for both users and upper managers traditional service requests (e.g., phone consults) have a negative effect and active community usage (e.g., posting questions or giving replies in an online support forum) has a positive effect on satisfaction. In addition, for upper managers (contrary to users) their organization's online knowledge consultation (e.g., browsing a frequently asked question section) also has a negative effect on their satisfaction.

*Keywords:* Customer support, online communities, business-to-business (B2B), multiple informants, multivariate regression

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## 4.1 INTRODUCTION

Offering support services is a critical component of successful business relationships (e.g., El Sawy and Bowles 1997; Karpen et al. 2015). In line with marketing literature, we define service support as customer assistance in learning about the product and its usage opportunities and solving product related issues (e.g., Das 2003; Dholakia et al. 2009). Given technological advancements, delivering customer support is evolving from traditional one-to-one support *service requests* (i.e., logging a formal service demand on a one-to-one basis, for instance through phone consults) towards one-to-many web-based support services, which can be both passive *online knowledge consultation* (i.e., consulting a static online knowledge repository, such as a frequently asked questions section) and *active community support* (i.e., participating in an interactive online support community, for instance by posting questions) (Dholakia et al. 2009; Nambisan 2002). Managerial interest in organizing and facilitating web-based support services, online communities in particular, to deliver support is thriving (Nambisan and Baron 2010); triggered by the possibility to invest in customer relationships and to obtain cost advantages (Algesheimer, Dholakia, and Herrmann 2005). Recent research suggests that online community support is cheaper to deliver than traditional support (Dholakia et al. 2009; Rosenbaum 2008), and also reduces the usage of more costly traditional support through service requests (Bone et al. 2015). Also, community usage is documented to lead to stronger customer relationships, such as increased likelihood to recommend (Gruen, Osmonbekov, and Czaplewski 2006). In this study, next to the impact of traditional service requests, we seek to understand the impact of both online knowledge consultation and active support community usage on customer satisfaction. Although customers might use alternative support channels (e.g., do a Google search), we focus our attention on the support channels which are directly offered by (i.e., under direct control of) a focal service provider.

Research in this realm is predominantly situated in a business-to-consumer (B2C) setting with the individual consumer as the unit of analysis (e.g., McAlexander, Schouten, and Koenig 2002; Porter and Donthu 2008; Thompson and Sinha 2008). In contrast, we investigate the impact of customer usage of a supplier firm's support services on satisfaction within a high technology high-involvement business-to-business (B2B) context. B2B organizations have multiple organizational layers, as the individual who uses the support services (which is not necessarily the individual who uses the functional product for which support is requested) is often distinct from the individual(s) responsible for purchase decisions. Therefore, for support usage in a B2B setting to have an effect

on beneficial and lasting corporate relationships, the benefits of obtained support (e.g., increased knowledge or efficient problem solving) and/or awareness of benefits must transfer from the individual support user to the decision maker within the customer organization. Yet, it is questionable whether the impact of customer support actually goes this far up the corporate ladder. Above and beyond, given their role in corporate buying centers (Webster and Wind 1972) and consequential differences in job roles and benefits sought from support (Narayandas 2005), upper management's perspective towards customer support might be fundamentally different from the perspective employed by the actual service support users. Therefore, upper management (as compared to frontline staff, which are the actual support users) might value different elements of support.

Accordingly, our central research objective is to take service support research beyond the individual user<sup>13</sup> by investigating the effect of different types of service activity (i.e., service requests, consulting online knowledge database, and active community support) on the customer satisfaction of users as well as its influence on upper management decision makers. Besides we aim to compare satisfaction implications among novel support channels (online knowledge consultation and active community support usage) and in contrast with the traditional support channel (service requests). Current literature typically investigates effectiveness of distinct support channels in isolation (e.g., Bagozzi and Dholakia 2006b; Wiertz and DeRuyter 2007), while it is managerial relevant to contrast various support channels in order to determine which channel is most effective in terms of driving customer satisfaction.

To examine these issues, we use the overall customer organization as the unit of analysis and relate a customer organization's support usage to satisfaction outcomes of employees operating at different corporate levels within the organizational hierarchy of the customer organization. Data were collected in partnership with a large Fortune 100 supplier of high tech services and merged from multiple internal sources over a longitudinal period of time. This data includes survey and behavioral data from both individual users and individuals working at higher corporate levels within the customer organization, including key decision makers.

In this research, we make three key contributions to extant literature. First and foremost, we take service support research in general and support community research in particular beyond the individual user (see Table 4.1). We show that in a B2B setting

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<sup>13</sup> To be concise throughout this Chapter we use the term 'user' to denote the customer support user. In a B2B setting the support user is not necessarily the product user. It occurs that product users contact an internal support department within their customer organization, which in turn contacts (i.e., uses support of) the service provider.

managers should not only seek to understand the value of their support services to the individual user, but also to individuals working at higher corporate levels within the collective customer firm, since users and upper management differ in their reaction to their firm's support usage. It might be especially fruitful to look beyond the individual user and shift focus (more) towards upper managers, since the latter group typically is responsible for the corporate relationship and the associated buying decisions (e.g., Webster and Wind 1972). Second, we contrast various ways of delivering customer support and determine which way of obtaining support is preferred by users and decision makers. Results indicate that for users obtaining support through active community support has a positive effect and obtaining support through service requests a negative effect on satisfaction, whereas for upper managers active community support has a positive effect and both service requests and online knowledge consultation have a negative effect on satisfaction. Our study shows that users and upper managers have different evaluations of customer support, based on their job tasks and bearing similarities with a classic principal-agent tension (e.g., Laffont and Martimort 2001). In response to Libai et al.'s (2010) call, we accordingly seek to show through which mechanisms operating active and passive web-based support (as well as alternative ways of delivering support) translate into broader results for the supporting firm, including satisfying relationships. Third, by contrasting online knowledge consultation and active community usage, we extend research on customer co-creation and customer self-service (e.g., Vargo and Lusch 2004). As explained in more detail below, support through online knowledge database consultation can be seen as self-service in customer support, since customers can obtain support without the service provider's direct interference (yet, the support solutions can only be searched and accessed). Active support community involvement can be seen as customer co-creation in customer support, since customers can help themselves and help other customers in a support community (for which support solutions can be added to and altered). We show differences between self-service in customer support (i.e., support through online knowledge database) versus customer co-creation in customer support (i.e., active support community usage), in particular by determining how job function relevance influences the valuation of customer self-service in support.

**Table 4.1: Research contribution and exemplary overview of support community literature**

<i>Paper (exemplary)</i>	<i>Setting</i>		<i>Unit of analysis</i>	
	B2C	B2B	Individual user	Upper management decision maker
Bagozzi and Dholakia 2006b	✓		✓	
Dholakia et al. 2009	✓	✓	✓	
Mathwick, Wiertz, and DeRuyter 2008	✓	✓	✓	
Nambisan and Baron 2007		✓	✓	
Wiertz and DeRuyter 2007		✓	✓	
Zhu et al. 2012	✓		✓	
<b>THIS PROJECT</b>		✓	✓	✓

## 4.2 CONCEPTUAL DEVELOPMENT AND HYPOTHESES

In a B2B setting multiple persons operating at different corporate levels are involved in buying decisions, which together constitute the organizational buying center (Webster and Wind 1972). In such a setting, service support users might not be the ones making actual purchase decisions. Therefore, it is imperative to not only look at how support service is perceived by users, but also at how upper managers perceive the support service. To investigate how both users and upper managers perceive the support service, we relate three distinctive types of service activity (i.e., traditional service requests, online knowledge consultation, and active community support) to customer satisfaction and argue that these relationships vary across individuals working at different corporate levels, influenced by job function relevance. Building further towards our predictions, we first highlight an underlying evolution of customer support and contrast various ways of obtaining support (in which we restrict attention to support channels offered by a focal service provider), followed by discussion on how both support users and upper managers (separately as well as in comparison) value these various ways of obtaining support. See Figure 4.1 for our conceptual framework.

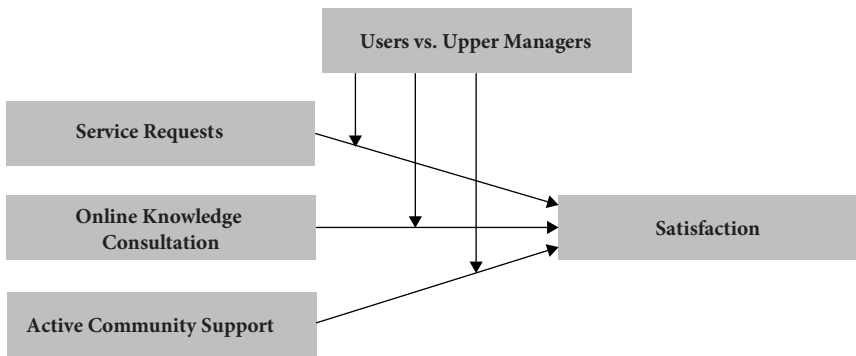


Figure 4.1: Conceptual framework

## 4.2.1 Sources of Service Support

### 4.2.1.1 Service requests

Traditionally, support has been delivered to customers on a one-to-one basis through service requests, in which the customer reports a problem to the company and a member of the company's support staff works together with the customer to solve this problem. A service request occurs when a customer contacts the service department of a service supplier, thereby logging a formal service request. Typical methods to log a service request include calling the helpdesk and receiving phone consults, email support, and on-site visits (Wiertz and De Ruyter 2007). From the support provider's perspective, as well as the customer organization's perspective, this labor-intensive way of delivering customer support is costly, since there is a great deal of repetitiveness due to solutions being distributed on an individual basis (Bone et al. 2015) and obtained solutions still need to be disseminated further throughout the customer organization. Yet, from the receiving customer organization's perspective, more labor-intensive customer support might nevertheless be yielding better service quality, due to involvement of support staff that understands the customer organization's nuances and thereby tailoring solutions (Rust and Huang 2012). Traditionally, research has argued that support users will perceive the service provider's staff members (in comparison to peer customers) to be the highest experts and to provide the most reliable answers (Dholakia et al. 2009); leading to higher quality perceptions of obtained solutions through service request activity. However, research also documents that the mere act of having to use traditional support (i.e., logging a service request) is often not liked by customers, since it typically indicates a service failure (e.g., Bitner, Booms, and Mohr 1994; Challagalla, Venkatesh,

and Kohli 2009). The non-performance of a supplied product can lead to significant losses (Markeset and Kumar 2005); potential system downtime due to service failures leads to a significant reduction in B2B company revenues (CA Technologies 2011). Thus, not surprisingly given the undesirable atmosphere they are in, customers typically have a negative mindset when (needing to) contacting the service provider (Challagalla, Venkatesh, and Kohli 2009), and thus evaluate the service requests negatively.

#### **4.2.1.2 Online knowledge consultation**

Technological advancements have altered, the above described, traditional way support is delivered to customers (Rust and Huang 2012). Information technology, and in particular the internet, made it possible to go from a one-to-one support model towards one-to-many web-based support services (Wiertz and De Ruyter 2007). Instead of on an individual basis, solutions are disseminated on a global basis by making them visible and accessible to other customers. Customers in turn can be passively or actively involved in one-to-many web-based support. On the passive side, they can go to the company's online knowledge base to solve their product issues. Instead of contacting a support employee, customers can browse a web-based support portal containing a static knowledge repository, which "can only be searched and accessed for support service but cannot be added to, changed, or altered" (Bone et al. 2015, p. 25) (e.g., searching for key terms, reading the frequently asked questions section of the service provider). As such, online knowledge consultation is a self-service channel in which customers can obtain service support without the service provider's direct interference (Negash, Ryan, and Igbaria 2003). From the service provider's perspective, this is a lower-cost support channel due to savings on support staff costs (Dholakia et al. 2009; Rosenbaum 2008). From the receiving customer organization's perspective this support channel has the potential to solve problems in a timely manner, since recurring problems do not have to be solved from scratch and/or individually by a staff member of the service provider (El Sawy and Bowles 1997). In addition, besides problem resolution, online knowledge consultation also enables learning about the product and its usage opportunities (Bone et al. 2015). Through static knowledge repositories, service providers can transfer knowledge and provide more timely dissemination of information to stakeholders (e.g., their customers). In static knowledge repositories solutions to previous problems are ubiquitous, so that support users can access them again and hence do not require much internal information dissemination throughout the customer organization. Also, the customer organization gains in flexibility of solution resolvance (Piccoli, Ahmad, and Ives 2001) and can learn



about and prevent new unanticipated issues. Hence, contrary to service request activity, online knowledge consultation offers increased efficiency of problem resolution (i.e., faster problem solution) and pro-active support / learning opportunities (i.e., knowledge gains) (Bone et al. 2015), which make customers likely more positive towards online knowledge consultation. However, there are also some innate drawbacks to this support model. For instance, solutions might not be exactly fine-tuned to the customer's individual situation, they may be out-of-date, they may be difficult to navigate, or may take considerable time investments to search for the correct solution (Bone et al. 2015).

#### **4.2.1.3 Active community support usage**

To overcome some of the limitations associated with passive web support, customers can actively be involved in peer-to-peer problem solving communities. In such communities, they can ask questions and/or reply to questions of others. Similar to online knowledge consultation, active community support usage offers increased efficiency of problem resolution. An online support community has the potential to offer real-time solutions for new problems (Dholakia et al. 2009). For instance, for novel problems other support channels might not be available or updated, yet community users could already be a few steps ahead in problem resolution. A support community enables users to tap into a large knowledge network (i.e., wisdom of the crowd) at any point in time (Bone et al. 2015). In addition, community support not only also allows learning opportunities, but goes a step further by allowing dynamic and interactive learning. A support community facilitates active engagement with the 'teacher' (be it a peer customer or a staff member of the service provider) (Piccoli, Ahmad, and Ives 2001). Contrary to static knowledge repositories, active involvement allows shared understanding and thereby greater insights (Porter et al. 2011), which is often necessary for effective learning with respect to problem resolution (Nambisan and Baron 2010). Because of this active involvement, support community usage goes beyond self-servicing towards customer co-creation in service support (Bone et al. 2015). In comparison to alternative means of obtaining support, customers have to perform more tasks on their own and thereby make more investments to obtain support (Wiertz and De Ruyter 2007). However, since customers co-create value with the company, they gain additional control over support and have the ability to improve the service offering (Chan, Yim, and Lam 2010). Furthermore, besides providing mere utilitarian value, active community support allows participants, particularly in a high involvement setting, to experience additional benefits from the co-creating experience, such as social status gains (e.g., Karpen et al. 2015; Yim, Chan, and Lam 2012). Such an

exceptional service experience will positively impact customer retention (Bolton, Lemon, and Bramlett 2006). Hence, active community support engagement offers even further increased efficiency of problem resolution, interactive learning opportunities, and a favorable service experience. Due this favorable experience customers likely evaluate active support community usage positively; recent research indicates a wide variety of positive effects of active community usage, such as increased recommendation likelihood (Gruen, Osmonbekov, and Czaplewski 2006) and repurchase intentions (Bagozzi and Dholakia 2006b).

#### 4.2.2 Job Function Heterogeneity

As apparent from our previous reasoning, each distinctive support channel operated by a focal service provider (i.e., service requests, online knowledge consultation, and active community support) has its own inherent benefits and drawbacks. In general, service requests are negatively evaluated, since they typically indicate a service failure (e.g., Challagalla, Venkatesh, and Kohli 2009). In contrast, online knowledge consultation and active community support usage are typically valued due to increased efficiency and, especially for community usage, the offering of a favorable service experience (e.g., Dholakia et al. 2009). Nevertheless, we expect that job function influences the evaluation of the distinctive benefits and drawbacks of various ways of obtaining support, bearing similarities with a classic principal-agent problem. The basic tenant of principal-agent theory is that a principal (e.g., an employer) delegates work to the agent (e.g., an employee), however the agent and the principal might have different interests and the principal cannot perfectly observe the behavior of the agent (Eisenhardt 1989). In our service setting, users (i.e., the agents) need to solve their customer organization's support issues, whereas upper managers (i.e., the principals) need to manage, supervise, and oversee their staff members' behavior (Eisenhardt 1989). Upper managers pursue the customer organization's interest, whereas their staff members (i.e., users) pursue their own (job function) interest. Upper managers should make sure that the interests of the customer organization and the individual users are aligned. These job functions have implications regarding how both users and upper managers perceive the various ways of obtaining support, which we will discuss next.

#### 4.2.2.1 *Users*

With respect to support, the user's core need, as defined by their job role within the organization, is solving their customer organization's support needs fast and adequate (Van der Heijden et al. 2013). Since users are the ones within their customer organization that need to participate in actual support tasks on a regular basis (i.e., in principal-agent jargon they are the agents to which principals delegated tasks; e.g., Laffont and Martimort 2001), they likely employ a short-term orientation towards support by focusing on day to day issues. This short-term orientation may be further amplified due to frontline staff often being stressed and hardly emotionally connected to the organization they work for (Katzenbach and Santamaria 1999). Due to this short-term orientation users may trade quality for speed when dealing with their customer organization's support issues. They need to solve the actual issues and would like to do this quickly. Since increased efficiency of problem resolution is a prime benefit of web-based support (e.g., Nambisan and Baron 2010; Rust and Huang 2012) users will positively evaluate web-based support. In contrast, service request may yield higher perceived quality due to involvement of supplier support staff (Dholakia et al. 2009; Rust and Huang 2012), yet may be less efficient. Besides, since users are the ones actually dealing with their organization's support issues, users will experience the negative mindset associated with having to log a service request. They experience the actual service failure and need to take care of it.

In addition, besides their core job task, individual users are also interested in their own personal values and needs, which can be considered non-task jobs (Webster and Wind 1972). After all, according to principal-agent theory, users are expected to maximize their own utility (e.g., Davis, Schoorman, and Donaldson 1997). In particular active community support yields the ability to satisfy the users' own personal values and needs, by providing the opportunity to obtain side benefits from customer support. Users have to invest resources (e.g., time, effort) in order to participate in and contribute to the community (e.g., by helping other customers), without this aiding them directly in their core job. However, in return for their community investments, users can not only gain technological knowledge (e.g., gaining product knowledge, which is their core task), but also psychological (e.g., emotional) and/or social benefits (e.g., by gaining community status) (Hoyer et al. 2010; Van Doorn et al. 2010). As such, active community usage not only delivers purely informational value, but also a favorable service experience (Mathwick, Wiertz, and De Ruyter 2008; Nambisan and Baron 2007). This aids the individual user, but not necessarily the customer organization he or she is working for.

#### 4.2.2.2 *Upper managers*

In contrast to users, upper management is typically not directly involved in daily and regular service support and problem resolution. Instead of directly experiencing the benefits of customer support (such as increased product knowledge and problem resolution; e.g., Dholakia et al. 2009), employees operating at higher levels simply need to know that support channels are helpful (i.e., successful in issue resolution) for his or her staff in order to assess whether investments are paying off, especially given the predominant contractual nature of B2B problem resolution (Bone et al. 2015). In other words, upper management wants to confirm that the company funds invested in support deliver value. Given their different functions within the customer organization (principal versus agent), the core benefits upper managers are looking for in support are different from the core benefits users are looking for. Whereas users might primarily want fast solutions, upper managers additionally also want solutions that are meeting future business needs, reflecting a tension between short-term (which are more likely pursued by users) and long-term (which are more likely pursued by upper management) goals (Katzenbach and Santamaria 1999). As stated before, within the typical trade-off between automated and fast support on the one hand, and high quality support on the other hand (Rust and Huang 2012; Van der Heijden et al. 2013), community support leans towards the former, rather than the latter (Dholakia et al. 2009). In contrast, traditional service requests might be more time-consuming, yet yield higher perceived quality of support, due to the involvement of supplier support staff understanding the customer organization's particularities, sensitivities, and future needs (Dholakia et al. 2009; Rust and Huang 2012). Besides, since upper managers are typically not the ones solving their organization's actual support issues, they will not personally experience the negativities and frustration of having to deal with service request issues. Upper managers are therefore neutral towards this aspect of service requests, since they will not personally be frustrated, yet their quality perceptions may be lowered. Yet, although we think that upper managers will evaluate service requests less negative, we thus do not think this goes as far as upper managers evaluating service requests positively. Still the general principle holds that service requests typically are surrounded by negative conations and being thought of as service failures (e.g., Bitner, Booms, and Mohr 1994; Challagalla, Venkatesh, and Kohli 2009), such that upper managers will still evaluate service requests negatively.

Additionally, with respect to active community usage, since upper managers do not personally experience additional (psychological and social) benefits from customer

support, they are likely attaching less value to these benefits. In fact, upper managers might even recognize potential dark sides of active support community usage. First, their staff members (i.e., users) invest valuable company resources (e.g., their time) in order to obtain side benefits of community support, while these investments have no direct or tangible payoffs for the customer organization. Since the job of upper management is to oversee the customer organization's interest (e.g., Davis, Schoorman, and Donaldson 1997; Eisenhardt 1989), upper managers will attach less or even negative value to citizenship behavior in the support community (such as helping other customers by replying to their questions). From a rational customer organization perspective such behavior has a negative cost-benefit tradeoff, due to potential knowledge leakage, waste of time, and even leakage of human capital. Upper management may treat their knowledge as proprietary goods (i.e., intellectual capital) and therefore be reluctant to knowledge spoilage in web-based support (Wasko and Faraj 2000). In addition, upper management may, correctly or not, regard their employees' community activity as "socializing and detracting from work" (Wasko and Faraj 2000, p. 171) and believe that time spend taking up additional service roles could be better spend on more important tasks for the customer organization (Van der Heijden et al. 2013). Also, in extreme cases, highly qualified staff members may reveal their qualifications and may become susceptible to competitive job offers.

### 4.2.3 Hypotheses

To recap, given their different job functions and reflecting a classic principal-agent tension, users and upper managers employ different perspectives on customer support. Due to a short-term orientation, users are (in comparison to traditional service requests) likely to being prone to put more value in the distinctive upsides of web-based support (i.e., learning opportunities and increased efficiency of problem resolution in both online knowledge consultation and active community usage). Upper managers, on the contrary, employ a long-term orientation and are likely to be less negative towards traditional service requests. In addition, users might have a negative predisposition towards service requests, since service requests are typically indications of service failure and other negativities, whereas upper managers are likely neutral towards the process of logging service requests being frustrating, they still will hold the notion that service request indicate service failures. Upper managers will also negatively value potential side benefits of active community support usage (such as, building connections and gaining status), since they, amongst others, may view this as a waste of company time. In contrast, users will like these benefits, since they can actual obtain them.

In light of these arguments, we hypothesize the following:

- $H_{1a}$ : *The effect of service request activity on satisfaction is negative for users.*
- $H_{1b}$ : *The effect of service request activity on satisfaction is negative for upper managers.*
- $H_{2a}$ : *The effect of online knowledge consultation on satisfaction is positive for users.*
- $H_{2b}$ : *The effect of online knowledge consultation on satisfaction is negative for upper managers.*
- $H_{3a}$ : *The effect of active community support usage on satisfaction is positive for users.*
- $H_{3b}$ : *The effect of active community support usage on satisfaction is negative for upper managers.*

### 4.3 RESEARCH DESIGN

To test these hypotheses, we use the overall customer organization as the unit of analysis and relate, through multiple regression equations, a customer organization's support usage to satisfaction outcomes of employees operating at various corporate levels within the organizational hierarchy of the customer organization (i.e., individual users and upper managers).

#### 4.3.1 Data and Sample

Data were collected in partnership with a large Fortune 100 supplier of high tech services and merged from multiple sources over a longitudinal period of time. The data covers a representative group of 7865 customer organizations, all with access to each distinct support channel offered by the Fortune 100 high tech service company, operating in a wide variety of industries and using various products and services offered by the Fortune 100 company. Data include behavioral activities, aggregated over all individuals working within the same customer company, regarding the support activity of these customer organizations and survey data regarding their satisfaction. Using a common identifier we merged service request logs (captured from the service provider's log files), the customer organizations' online knowledge consultation (captured from clickstream data), the customer organizations' active support community usage (also captured from clickstream data), and a customer relationship survey. Since we relate support behavioral data to survey outcomes, we preclude typical survey research limitations, such as common method bias.

The customer relationship survey, which contains our dependent variable, is targeted at employees operating at various corporate levels performing various job roles within the organizational hierarchy of the customer organization. We classified those who self-reported their job level as individual contributor (i.e., functional and technical users) or as manager (who at least used support themselves once) as users and those who indicated their job level as director or as manager (but did not use support themselves at least once) as upper managers. Discussions with the Fortune 100 high tech service company revealed that respondents who classify themselves as managers can be either lower-level managers seeking service or community support themselves or upper managers who do not do so. We therefore distinguished between managers that used or did not use support themselves at least once. In addition, we excluded those who indicated their job level as executive (they are, according to the Fortune 100 high tech service company, too far removed from daily operations) from our sample. Although the Fortune 100 company administers the customer relationship survey on a bi-quarterly basis, their basic sampling policy is to survey one job role per customer organization and to survey each customer organization only once, in order to reduce burden on their customers. Therefore, to ensure a representative and substantial sample, we pooled multiple time periods by relating support activity in either the third fiscal quarter of 2011 (December 2010, January 2011, and February 2011) or the first fiscal quarter of 2012 (June 2011, July 2011, and August 2011) to satisfaction outcomes measured in the succeeding quarter of either the fourth fiscal quarter of 2011 (March 2011, April 2011, and May 2011) or the second fiscal quarter of 2012 (September 2011, October 2011, and November 2011), respectively. These time periods were selected on the basis of the start of the online community. Note that in order to test causal relationships, we measured support activity in one time period ( $t_1$ ) and measured satisfaction outcomes in a subsequent time period ( $t_2$ ).

### 4.3.2 Measures

#### 4.3.2.1 *Dependent variable*

Our dependent variable is customer satisfaction (with the firm). Customer satisfaction is measured with a survey item on a 10-point scale. Since customer satisfaction is a straightforward construct and a central predictor of future performance (e.g., Morgan and Rego 2006), we used a single-item survey measure (cf. Bollen 1989; Rossiter 2002).

#### 4.3.2.2 *Independent variables*

Our independent variables are captured with behavioral data and reflect the various ways of obtaining customer support. We measured *service requests* with a single-item measure: the total number of opened and closed service requests. We measured *online knowledge consultation* with three items (which we combined into factor scores): the number of search queries, the number of community logins, and the number of note reads. We also used a multi-item scale to measure *active community support*. This scale contained the following items (we also combined these items into factor scores): number of threads started in the support community, number of questions asked in the support community, and number of replies given in the support community.

**Table 4.2: Summary of measures**

<i>Construct</i>	<i>Measure</i>	<i>Time period</i>	<i>Level</i>
<b>Dependent variable</b>			
Satisfaction	Survey item (“Overall, how satisfied are you with company X as a provider?”) on a 10-point scale	Q4 of 2011 & Q2 of 2012	Users & upper managers
<b>Independent variables</b>			
Service request	Number of opened and closed service requests (log-transformed)	Q3 of 2011 & Q1 of 2012	Customer organization
Online knowledge consultation	Number of search queries (log-transformed)	Q3 of 2011 & Q1 of 2012	Customer organization
	Number of note reads (log-transformed)	Q3 of 2011 & Q1 of 2012	Customer organization
	Number of community logins (log-transformed)	Q3 of 2011 & Q1 of 2012	Customer organization
Active community support	Number of threads started (log-transformed)	Q3 of 2011 & Q1 of 2012	Customer organization
	Number of replies given (log-transformed)	Q3 of 2011 & Q1 of 2012	Customer organization
	Number of questions asked (log-transformed)	Q3 of 2011 & Q1 of 2012	Customer organization



We log-transformed all behavioral items, since they were non-normally distributed (we do this for means of normality, which is amongst others a requirement for the factor analysis we perform later on; Byrne 2001).<sup>14</sup> An overview of all measures and associated data sources appears in Table 4.2; the overview of the descriptive statistics and correlations of variables is in Table 4.3.

**Table 4.3: Descriptive statistics and correlation matrix<sup>15</sup>**

	<i>Mean</i>	<i>SD</i>	<b>1.</b>	<b>2.</b>	<b>3.</b>	<b>4.</b>
1. Satisfaction	6.83	1.86	1.00			
2. Service request	-1.20	4.76	-.10***	1.00		
3. Online knowledge consultation	0.00	1.00	-.09***	.83***	1.00	
4. Active community support	0.00	1.00	.01	.19***	.17***	1.00

\*\*\*  $p < .01$

### 4.3.3 Modeling Approach

To test our hypotheses we make use of a three-step approach. First, we use factor analysis to develop and verify a multi-item scale for online knowledge consultation and a multi-item scale for active community support usage. Since usage of various support channels is likely correlated, we use an oblique rotation (Hair et al. 2005)<sup>16</sup>. Second, we estimate a pooled regression equation relating a customer organization's service request activity, online knowledge consultation, and active community support usage to customer satisfaction. We then investigate if pooling our data over job levels (users and upper managers) is justified by means of a Chow test. Third, after determining that it is not justified to pool over job levels, we estimate two separate regression equations for the two job level groups: one regression for the user group (with a sample size of 4323 customer organizations) in which we relate a customer organization's support usage to their users' satisfaction and another regression for the upper manager group (with a sample size of 3542 customer organizations) in which we relate a customer organization's support

<sup>14</sup> Since we log-transformed our independent variables we essentially estimated a level-log model. We also re-estimated our model after log-transforming our dependent variable and hence investigated a log-log model. Results of the log-log model are substantially very similar to the results of the reported level-log model.

<sup>15</sup> The mean and standard deviation for online knowledge consultation and active community support usage are 0 and 1, respectively, since these scales are based on Z-scores from factor analysis.

<sup>16</sup> We also estimated our model with an orthogonal rotation method. Results are similar, only exception is the diminished significance (from 5% to 10% significance level) of the effect of active community usage on upper management satisfaction.

usage to their upper managers' satisfaction. We formally compared regression coefficients across groups by means of a  $\chi^2$  test.

## 4.4 RESULTS

### 4.4.1 Factor Analysis

By means of a factor analysis with Oblimin rotation we reduced the dimensionality of our online knowledge consultation and active community usage scales. Both the Kaiser-Meyer-Olkin (KMO) measure (KMO = .74, which is above the recommended value of .60) and Bartlett's test of sphericity ( $\chi^2 = 85918.50, p < .01$ ) justify the use of factor analysis (Hair et al. 2005). The factor analysis confirmed our scales; all items loaded substantially on their target factor (average factor loading .97, minimum factor loading .89) and did not load on their non-target factor (all cross factor loadings below .30). Cronbach's  $\alpha$  indicates that our scales are 'excellent' (Cronbach's  $\alpha_{\text{online knowledge consultation}} = .99$ ; Cronbach's  $\alpha_{\text{active community usage}} = .94$ ). We used factor scores for online knowledge consultation and active community usage in our subsequent analyses. We displayed factor loadings and Cronbach's  $\alpha$  of our scales in Table 4.4.

### 4.4.2 Regression results

We pooled our sample over users and upper managers and estimated a pooled regression equation relating a customer organization's service request activity, online knowledge consultation, and active community support usage to customer satisfaction. Results in Table 4.5 indicate that a customer organization's service request activity significantly decreases satisfaction ( $\beta = -.04, p < .01$ ), a customer organization's online knowledge consultation does not significantly impact satisfaction ( $\beta = -.02, \text{n.s.}$ ), and a customer organization's active community support usage increases satisfaction ( $\beta = .06, p < .01$ ). We investigated whether these coefficients are similar across the satisfaction of users and upper managers, and thus whether it was justified to pool our data over job level, by means of a Chow test. A Chow test indicates that the effects of service request activity, online knowledge consultation, and active community support usage differ between users and upper managers (Chow F statistic (4, 7857) = 18.10  $p < .01$ ).

**Table 4.4: Multi-item scale validity and factor loadings**

<i>Scale (Cronbach's <math>\alpha</math>)</i>	<i>Items</i>	<i>Item loading</i>
Online knowledge consultation (Cronbach's $\alpha = .99$ )	Number of search queries (log-transformed)	.99
	Number of note reads (log-transformed)	.99
	Number of community logins (log-transformed)	.98
Active community usage (Cronbach's $\alpha = .94$ )	Number of threads started (log-transformed)	.98
	Number of replies given (log-transformed)	.88
	Number of questions asked (log-transformed)	.98

Therefore, we estimated separate regression equations for users and upper managers. As can be seen from Table 4.5, a customer organization's service request activity significantly decreases user satisfaction ( $\beta = -.05, p < .01$ ), in support of  $H_{1a}$ . Supporting  $H_{1b}$ , service request activity also significantly decreases satisfaction of upper managers ( $\beta = -.03, p < .05$ ). We also formally compared the coefficients of service request activity for users and upper managers by means of a  $\chi^2$ -difference test, whereby we compare a model in which we restrict the coefficients to be equal across groups to an unrestricted model<sup>17</sup>. Results indicate that the satisfaction implications of service request activity do not differ significantly between users and upper managers ( $\Delta\chi^2(1) = 1.65, n.s.$ ). With respect to online knowledge consultation, surprisingly, a customer organization's online knowledge consultation does not increase user satisfaction, although the coefficient is in the hypothesized direction ( $\beta = .03, n.s.$ ) (contrary to  $H_{2a}$ ). However, online knowledge consultation significantly decreases upper management satisfaction ( $\beta = -.13, p < .05$ ), in support of  $H_{2b}$ . Furthermore, users and upper managers differ significantly in their reaction towards their customer organization's online knowledge consultation

<sup>17</sup> We also compared whether the satisfaction implications of various support channels differ between users and upper managers by means of a pooled regression with interaction effects between job level and support channel. Results indicate that upper managers do not differ in their reaction towards service request activity ( $\beta_{\text{service requests} * \text{upper managers}} = .02, n.s.$ ), become dissatisfied instead of satisfied from online knowledge consultation ( $\beta_{\text{online knowledge consultation} * \text{upper managers}} = -.16, p < .05$ ), and do not differ in their reaction towards active community support usage ( $\beta_{\text{active community usage} * \text{upper managers}} = -.04, n.s.$ )

( $\Delta\chi^2(1) = 4.23, p < .05$ ). Finally, as predicted in  $H_{3a}$ , a customer organization's active support community usage significantly increases user satisfaction ( $\beta = .07, p < .05$ ). For upper management, active support community usage also increases upper management satisfaction, opposite to the direction predicted in  $H_{3b}$  ( $\beta = .07, p < .05$ ). Given these results, users and upper managers do not differ significantly in their reaction towards their customer organization's service request activity ( $\Delta\chi^2(1) = .01, n.s.$ ).

**Table 4.5: Impact of customer organization's support channel usage on satisfaction**

	<i>Pooled sample</i>	<i>User group</i>	<i>Upper manager group</i>
<b>Independent variables</b>			
Service request activity	-.040 (.008)***	-.049 (.010)***	-.028 (.012)**
Knowledge consultation	-.021 (.037)	.031 (.050)	-.128 (.056)**
Active community usage	.064 (.021)***	.066 (.028)**	.069 (.033)**
Intercept	6.783 (.023)***	6.922 (.030)***	6.601 (.036)***
Number of observations	7865	4323	3542
R <sup>2</sup>	.012	.013	.018
Adjusted R <sup>2</sup>	.012	.012	.017
F-Value	31.778***	18.620***	21.167***

*Notes:* Parameter estimates (standard errors). Two-sided tests are used for all effects. The dependent variable is customer satisfaction; for pooled sample this is overall satisfaction, for user group this is the satisfaction of users, and for upper managers group this is the satisfaction of upper managers. \*  $p < .10$  \*\*  $p < .05$  \*\*\*  $p < .01$ .

## 4.5 ROBUSTNESS CHECKS

To add further robustness to our findings we investigate alternative explanations of our findings and an alternative estimation method.

### 4.5.1 Ruling Out Alternative Explanations

Besides our hypothesized reasoning, three alternative explanations of our results are that (1) upper managers tend to be older and older people may like novel technologies (such as, web-based support) less, (2) customer organizations self-select their support channel (e.g., first use the support community and only log a service request when active community usage did not resolve the problem), and (3) problems that are solved through

service requests may be more severe than problems that are solved through either online knowledge consultation or active community support usage.

#### ***4.5.1.1 Upper managers are older and older people dislike web-based support***

To investigate this first alternative explanation, we used a subsequent survey (measured in January 2012). This survey is targeted at a different and smaller set of individuals ( $N = 2191$ ), since the data provider wants to avoid respondent fatigue and burden upon their customer organizations. The survey, amongst others, contains respondents' age, job level, online knowledge consultation satisfaction, and community satisfaction. 1056 respondents out of the total of 2191 survey respondents reported their age. After removing 33 observations with an unrealistic reported age (i.e., age > 100 years), results indicate that older respondents indeed like web-based support less (correlation between age and support community satisfaction =  $-.09$ ,  $p < .05$ ; correlation between age and online knowledge consultation satisfaction =  $-.10$ ,  $p < .01$ ). However, surprisingly, age was significantly negatively correlated with job level (correlation =  $-.07$ ,  $p < .05$ ). A t-test substantiates that also users and upper managers specifically do significantly differ in age. On average, users ( $M = 42.82$ ,  $S.E. = .39$ ) are slightly older than upper managers ( $M = 40.24$ ,  $S.E. = .54$ ); this difference is significant ( $t(992) = 3.620$ ,  $p < .01$ ). Thus, although older people dislike web-based support, it appears upper managers are, contrary to expectations, slightly younger than users.

#### ***4.5.1.2 Customers use support channels in sequence***

Our data provider provided us with monthly count data, therefore we cannot investigate sequences of support channel usage in our focal dataset. Nevertheless, in the same subsequent survey as mentioned above, targeted at a different and smaller set of individuals, we asked respondents to rate their preferred support channels to solve support issues. The respondents of this follow-up survey do not necessarily work for the customer organizations of the focal sample; the customer organizations they work for only partially overlap with the customer organizations of the focal model. With using support channel preference, instead of support channel sequence, we cannot perfectly rule out sequences of support channel usage; however we can determine the distribution amongst choice of first/primary channel (to find out whether this is varied or uniform across customer organizations) and whether the choice of first support channel impacts our findings. Descriptive statistics indicate that service requests is for 22%, online knowledge consultation for 55%, active community usage for 8%, and an alternative channel for

15% of the respondents their first preferred support channel. Of the respondents with online knowledge consultation as preferred channel, the second preferred support channel is service requests for 43% of the respondents, active community usage for 32% of the respondents, and an alternative channel for 25% of the respondents. Thus, support channel preferences are relatively disperse. Although we did not have observations for all customer organizations, we also included support channel priorities (service request priority, online knowledge consultation priority, active community usage priority, and other channel priority) as control variables in our model (using mean replacement for missing observations). These control variables were not significant and results of hypothesized effects are equal (identical signs and significance levels) to our focal model. Thus, after controlling for choice of first support channel our results remain similar.

#### ***4.5.1.3 Service requests are used for more severe problems***

To control for the severity of a customer organization's service requests, we used the average time needed in minutes before their service requests were closed as a measure of service request severity<sup>18</sup>. When adding this measure as a control variable to our model, the control variable itself is, not surprisingly, significantly negative for users and upper managers, yet the results of the hypothesized effects are similar to our focal model (sign and significance of hypothesized effects are equal).

#### **4.5.2 Alternative Estimation Method**

We investigated whether an alternative model estimation method would yield similar results. An alternative to using factor analysis coupled with linear regression to test our hypotheses is using a multi-group structural equation model (Byrne 2001). We estimated two separate structural equation models: one for user satisfaction and one for upper management satisfaction. We compared coefficients across groups with a nested model approach: we use a  $\chi^2$  difference test to compare a model in which a structural path (e.g., active community support on customer satisfaction) was constrained to be equal across both groups with an unconstrained model in which the structural path was allowed to differ across both groups. Results are similar to our focal model (sign and significance of coefficients are equal across modeling approaches and  $\Delta\chi^2$ -test yield also similar sign and significance levels).

<sup>18</sup> Since service requests that are closed very fast might in some cases also indicate very severe problems we also investigated a non-linear, inverted U-shape effect of average service request closing time. We added a quadratic term as additional control variable: this variable was significant positive at the 10% in the pooled sample and upper management sample. Still same hypothesized effects as in our focal model, with equal signs, remained significant.

## 4.6 CONCLUSION AND DISCUSSION

We investigated how both users and upper management value various ways of obtaining customer support (i.e., through traditional service requests, online knowledge repositories, and active community support). Results demonstrate that for support users traditional service request activity has a negative effect on satisfaction while active support community usage has a positive effect on satisfaction. In contrast, for upper managers both passive web-based support and traditional service requests have a negative effect on satisfaction, and active web-based support has a positive effect on satisfaction. The main insight of our research is that we show that when studying the effectiveness of various support channels within a B2B setting it is imperative to not only look at implications for users (they that obtain the actual support), but also at the implications for upper managers (they that are primarily responsible for contract renewal, contract upgrading, and the like). Our key insight and results have important theoretical and managerial implications.

### 4.6.1 Theoretical Implications

The effectiveness (in terms of customer satisfaction) of various types of customer support behavior varies significantly across employees operating at various corporate levels. Those in upper management become satisfied from active community support and dissatisfied from service support employees spending time and resources solving their problems in online knowledge databases or using traditional service requests. It seems that managers in general dislike that their customer organization has to use support, but that active community usage buffers this negative effect. The surprisingly positive effect for upper management satisfaction of active community usage could be because upper managers see upsides in networking with other customer organizations, benefitting from the wisdom of the crowd, and solution richness when obtaining advice from peer customers who can include context from using the product (e.g., Mathwick, Wiertz, and De Ruyter 2008). Conversely, as predicted, those actually involved in support activity (i.e., users) appear to attach satisfaction to more engaged types of support (i.e., active community support) over traditional support (i.e., service requests). Therefore, we can conclude that 'one size does not fit all'. We take service support research in a B2B setting beyond the individual user and show the relevance of investigating individuals operating at various job roles within the customer organization. In information systems research user satisfaction is investigated in various settings, incorporating users operating at various

job levels (ranging from individual users, managers, to executives) (Negash, Ryan, and Igbaria 2003). Still, within a single study only users operating at a single job level are investigated. We add to this by showing that it is imperative to investigate multiple job levels within a single study, since due to job function heterogeneity individuals working at different corporate levels hold opposite views.

Our results also show the applicability of principal-agent theory in a service support setting. Since users and upper managers have different job functions and responsibilities within their respective customer organizations they make different trade-offs when evaluating received support. Users need to solve day to day support issues and can obtain side benefits from active community support usage, whereas upper managers need to evaluate the behavior of their staff members (i.e., users) and make sure the customer organization's investments in support are providing value. Due to this interrelationship between individuals working at different job levels we demonstrate that support engagement of one individual (users) can impact the satisfaction of another individual (upper manager) working at a different job level.

#### **4.6.2 Managerial Implications**

We provide managers valuable insight in the performance implications of offering various support channels in a B2B context and the underlying processes. Our key findings point at the crucial role of understanding your audience in service support, especially since in typical B2B relationships and organizational buying centers multiple individuals are involved taking up various roles and responsibilities (e.g., Anderson and Narus 1990; Narayandas 2005; Webster and Wind 1972). We show that users' satisfaction declines from traditional service support through service requests and inclines from active web-based support through community support usage. In contrast, upper managers' satisfaction declines from traditional service requests and passive web-based support through online knowledge consultation, and inclines from active community usage. Since staff members of a customer organization operating at different corporate levels have various interests, service providers have to make a trade-off when determining which support channels they want to offer their customers. Nonetheless, current practice seems to hint at a lack of understanding due to their 'one-size-fits-all' policy and 'when we build it, they will come' approach (Nambisan and Baron 2009).

Our results also have important managerial implications with respect to customer self-service and customer co-creation (e.g., Vargo and Lusch 2004). We view online knowledge consultation as customer self-service in support. Since active



community support usage goes a step further by including peer-to-peer interactions, we view active community support usage as customer co-creation in support (cf. Bone et al. 2015). Based on this analogy, our findings can provide an answer to the following central question managers nowadays face (e.g., Wiertz and De Ruyter 2007): Can you (partially) delegate support to customers? Difference in the effectiveness of online knowledge consultation versus active community support allows us to provide an answer to this question. Our results show that self-service in customer support appears to not be accepted, since users do not become more satisfied from their customer organization's online knowledge consultation, while upper managers become less satisfied. In contrast, customer co-creation in support seems more appropriate, for both users and upper managers, since for both of them active support community usage has a positive effect on satisfaction. For the service provider, online support is a low-cost alternative to deliver support (Dholakia et al. 2009; Rosenbaum 2008), yet key players become less satisfied from solving problems through online knowledge databases (even in comparison to other types of support). This difference between the effectiveness of online knowledge consultation and active community support usage is intriguing. Previous research suggests that it would be more rational to free-ride in the community by being a so-called lurker instead of contributing actively to the community (and therefore having to invest more time, effort, and resources) (Wiertz and De Ruyter 2007). However, our results indicate that upper managers hold the insight that obtaining solutions through online knowledge consultation might not be exactly fine-tuned to the customer's individual situation and might highly dependent on the effectiveness of their staff members' search skills and the completeness of the knowledge database, whereas active support community usage allows customer organizations to have more control over support, gain the opportunity to improve the service offering they receive, and actively discuss problems with peer customers (Bone et al. 2015; Chan, Yim, and Lam 2010). Therefore, it appears that upper managers, within the emerging web-based support services, do not fear for a dark side of community rather they fear for a dark side of static knowledge consultation.

The above insights bring inherent channel guidance recommendations. Support service providers could create a win-win situation by steering away support users from traditional service requests. This traditional model is usually costly for the service provider (Bone et al. 2015) and our results show that both service users and upper managers become dissatisfied from using this support option. In addition, with respect to web-based support service, service providers should aim to activate customers instead of having them only lurk in communities, since online knowledge consultation decreases

upper management satisfaction and active community support usages increases upper management satisfaction. An alternative approach is that service providers could highlight the benefits of and aim to create leverage for passive web-based support services among upper managers. While upper managers may hold the view that in web-based support active engagement is a prerequisite (upper management might want solutions rather than just reading and browsing), service providers should inform them that mere lurking also provides value and is not a waste of company resources. For instance, in order to increase visibility and perceived usefulness, service providers could send a monthly update to upper managers to inform them of the top knowledge database insights of that particular month. These results also brings inherent recommendations for the design of reward systems in online support communities; since users as well as upper managers become satisfied from community support usage and upper managers become dissatisfied from static knowledge database consultation, service providers should reward users (e.g., give points and/or guru status) for their activities and not reward for mere passive browsing.

#### 4.6.3 Limitations and Further Research Opportunities

In our study we face some limitations. These limitations yield avenues for future research. First, in our model we were not able to relate user satisfaction to upper management satisfaction within a single customer organization. Our data provider used a sampling procedure to only sample one job level per customer organization, in order to reduce burden upon them. Future research could include this potential social influence effect within a single customer organization.

Second, we make use of data provided by a single service provider, which operates in IT support. Although our results regarding user satisfaction (in particular the positive effect of community usage) are in line with previous research in various settings (e.g., Gruen, Osmonbekov, and Czaplewski 2006; Porter and Donthu 2008), and we complement these studies by also incorporating upper management satisfaction, inherent to working with a single company is that our results may potentially be limited to the particular setting our data provider operates in. Nevertheless, the Fortune 100 high tech service provider is a large company serving customer organizations from a broad array of industries, located across the globe, and using various products and services. Still, IT professionals may have a predisposition towards customer support provided through relatively novel technologies. Also, the value of additional benefits of active community usage (e.g., social status gains) might be dependent on customer involvement. These benefits are likely important in our high tech high-involvement setting, but might be

less relevant for customer support for low involvement products and services. All in all we encourage future research to investigate generalizability of our findings across other intangible service settings.

Third, we focus on the support channels which are offered by a focal service provider, since these channels are under direct managerial control. However, descriptive statistics in the robustness check section indicates that 15% of the respondents mentioned an alternative channel (e.g., Google) as their first preferred support channel. Due to lack of data availability we could not incorporate alternative channels outside the scope of our data provider in our analyses.

Fourth, our study establishes negative satisfaction implications of online knowledge consultation. On the other hand, online knowledge databases (e.g., FAQ-sections) are cheaper to deliver (Bone et al. 2015). Therefore, a service provider has to make a trade-off between lower costs of delivering support and satisfaction implications (Rust and Huang 2012). Future research should study the net effect of operating web-based support, as called for by Libai and colleagues (2010).



