Design Principles for a Social Question and Answers Site: Enabling User-to-User Support in Organizations

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Abstract. The adoption of consumer technology in organizations, termed as IT consumerization, alters the IT infrastructure of many organizations. Letting employees decide which IT tools to use for their work increases the complexity of the organizational IT landscape and immediately raises the question how to provide adequate support given the multitude of technologies. Bring-Your-Own-Device advocates argue that employees can provide IT support on their own. An established concept to provide user-to-user support are social questions & answers sites (SQA). While such community sites are perfectly suited for exploratory problem solving, they lack however suitability to help solving specific problems subject to a specific organization. Moreover, receiving fast ad-hoc help in SQA is rather unlikely, as communication is always indirect and experts to solve the problem are unknown beforehand. The work presented in this paper explores key design characteristics of SQA sites in organizations that overcome the shortcoming of public SQA sites. Based on existing IS literature, we identify four kernel theories that are relevant for SQA sites in organizations and derive meta-requirements from them. In a next step, we analyze five public SQA sites to identify common design principles of SQA sites that are already applied. The main part of our analysis matches the identified design principles with the formulated meta-requirements to address potential gaps with respect to an enterprise environment. We conclude our research with the suggestion of additional design principles for SQA sites that account for their application in an organizational context.

Keywords: IT consumerization, BYOD, user-to-user support, social questions and answer sites.

1 Motivation

The adoption of consumer technology in organizations, termed as IT consumerization [1], alters the IT infrastructure of many organizations. Inspired by experiences from

the private realm, people demand the use of sophisticated IT tools for work purposes that ideally can be chosen by themselves [2]. IT, once found solely in large organizational units, is now in the possession of single individuals. People have started to operate "complex and relatively large-scale individually owned IS" [3, p. 252]. In positive terms, IT selection by employees gives organizations the opportunity to apply technology more precisely to the individual needs of a particular knowledge [4]. In order to provide their employees with this choice, many organizations have launched "bring/choose-your-own-device" (BYOD/CYOD) initiatives [5]. However, letting employees decide which IT tools they want to use for work increases the heterogeneity of a company's IT landscape leading to various negative consequences. One particular problem is the question of enterprise wide IT support. By now, organizations have attempted to maintain control over devices, access points, interfaces and security controls in order to protect critical IT resources. However, "more devices, times more apps, equals exponentially more complexity for IT to support" [6, p. 4]. A recent survey found out that IT leaders termed "providing IT support for multiple mobile platforms" as a top challenge of BYOD [7]. Similarly, Niehaves et al. identified an increased support complexity as a major disadvantage of IT consumerization for organizations [8]. In this sense, every BYOD or CYOD strategy automatically creates a target conflict between higher freedoms for employees and comprehensive tech-support. The "growing variety of devices, computing styles, user contexts and interaction paradigms will make everything everywhere strategies unachievable" [9]. This complexity will challenge traditional support approaches that are often standardized to save costs or to be outsourced to an external provider.

BYOD advocates argue that employees that use privately owned devices for work can provide IT support on their own. Digital literacy has increased sufficiently to put the keys for IT support in the hand of the users. Younger generations are increasingly tech-savvy because they have grown-up with technology [10]. Wang et al. refuse this disparity between generations and replace it by a continuum of digital literacy that is influenced by demographical, psychological, organizational and social factors [11]. In any case, it is indisputable that people give more importance to IT, in both private and professional life. Consequently, people have built a familiarity with technology that they can transfer to the workplace to solve work problems [1]. Even complex problems can be solved if users receive expert assistance. The internet has brought up multiple social questions and answers sites (SQA), where users can give support to each other [12]. While such sites are perfectly suited for explorative problem solving, they lack suitability to help solving specific problems, for example, related to a particular business process, subject to a single organization. Moreover, receiving fast ad-hoc help in SQA is rather unlikely, as communication is always indirect and experts to solve the problem are unknown beforehand. When implementing SQA's in an organization, the aforementioned aspects can be healed. As employee skills are partially knowledge inside the organization, experts for specific problems can be identified enabling direct interaction. Furthermore, management practices can be used to encourage knowledgeable employees to share their know-how. In consequence, SQA implemented in an organization may address support challenges raised by BYOD or CYOD strategies. With this aim in view, our paper searches for principles that guide the design of SQA in organizations. Hence, we address the following research question:

RQ: What are design principles of SQA in organizations to enable user-to-support between employees?

The remainder of this paper is structured as follows. The next chapter lists related work about social software in organizations and SQA. After explaining our research method in Chapter 3, Chapter 4 presents a set of kernel theories, which we use to derive design principles for SQA in organizations. Following, in Chapter 5 we analyze five online SQA regarding our identified principles. We discuss the findings in Chapter 6 and draw conclusions regarding the formulation of our design principles.

2   Related Work

2.1   Social Software in Organizations

Kaplan and Haenlein define social media as a „group of internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content" [13, p. 61]. Similarly, Kim et al. state that social web sites "make it possible for people to form online communities, and share user-created contents" [14, p.216]. Hence, the term social network sites focuses more on the networking aspects than the user generated content (UGC). Commonly the term is associated with web-based services that allow individuals to construct a public or semi-public profile, provide a list of other users they are connected to, and allow viewing this list of connections as well as those made by others within the system [15]. Typically, enterprise social software (ESS) is seen as a combination of social networking and social media for use in an enterprise [16].

Connected to the fact that most social software, whether in a private or a business context, is based on UGC, acceptance of these tools is crucial for their success. This is why several studies have targeted use behavior on these platforms. One important antecedent of use is the perceived network size [17], i.e., the total number of members, or, even more so, the number of peers [18]. Especially the latter was found to influence both the perceived usefulness as well as the perceived enjoyment of the particular platform [18]. While many studies have focused on explaining individual intention to use by means of established constructs from technology acceptance literature [19, 20], use behavior has also been analyzed on a group level with respect to the we-intention to use the social system [21, 22]. In addition, different use types have been identified. For instance, in an enterprise context, Muller has differentiated between passive („lurking") and active usage („contribution") of enterprise social media [23]. Similarly, in a private context, Pöyry et al. differentiate between participation and browsing [24]. With respect to UGC, the contribution of knowledge is an important behavior. In this context, Pi et al. found that especially subjective norm and a sense of self-worth positively influence the attitude towards knowledge sharing [25].

2.2   Social Question and Answer Sites

Previous research distinguishes between three types of question and answers sites (QA) currently found on the internet [26]: (1) Digital reference services are an online

analogue of library reference services: information seekers direct questions to expert researchers who refer them to sources of useful information. (2) Expert services are topic centric and employ experts who provide information seekers with the required information. (3) Social question and answer sites (SQA) leverage the time and effort of everyday users to answer questions. Shah et al. define SQA as "a Web-based service for information seeking by asking natural language questions to other users in a network" [27]. SQA sites allow anyone to ask and answer questions and make use of various algorithmic strategies to allow a collaborative assessment of the quality of the content submitted [28]. Usually SQA focus on the information needs of an individual and do not specifically support the collaborative information accumulation of a group ([29]). Respectively, most SQA sites have little structural or role-based organization. However, many sites share characteristics of online communities as they have a base of regular users who engage in off-topic discussion, reply to one another instead of just asking or answering questions or take the role of a moderator [26].

One prominent research stream on SQA studies the behavior of users on SQA sites. For instance, Gazan identified two roles of question answerers – specialists and synthesists [29]. Specialists are knowledge experts who provide answers without referencing other sources, while synthesists are the ones who do not claim any expertise and provide answers with references to existing solutions. Furthermore, Gazan showed that answers from synthesists tended to be rated more highly than answers from specialists [29]. With regards to information seekers, Gazan found two types of questioners – seekers and sloths. Seekers demonstrate active engagement with the community and pursue communication regarding their questions. Sloths do not pursue further interaction with community members after receiving answers to their questions [29]. A second research stream focuses on design characteristics of SQA sites and tries to link them to user behavior or answer quality. A study of Tiwana and Bush found that most systems which do not allow social interaction with other users suffered from underuse or were abandoned outright [30]. Shah et al. examined Yahoo Answers and showed that its popularity is connected to its sophisticated reward features that intensify participation of users [27]. Adamic et al. argue that the approach of Yahoo Answers to allow exactly one answer as best, poses a potential weakness as several answers may be equally good and the standards by which answers are evaluated differ among individuals [31]. In turn, the possibility to annotate previous answers contributes to a higher user engagement as it creates a sense of collaborative information seeking [32].

3   Methodology

In order to investigate our research questions, we followed a two-step approach. First, we analyzed scientific literature to determine the relevant body of justificatory knowledge. Our literature search focused on such work which addresses three reoccurring themes of related work on SQA: (1) overall volunteer participation, (2) organization as a social network and (3) focus on knowledge storage and retrieval.

After consolidating all sources in joint discussions, we identified four research streams that provide guidance for core design questions of SQA artifacts in organizations [33] and furthermore establish theoretical links to system outcomes that can be empirically tested [34]. The results of this step, were summarized in form of eight meta-requirements (MR) that outline the scope and purpose of the anticipated class of SQA artifacts [35].

The second step included the development of design principles (DP) for SQA in organizations that satisfy the MR. The review of related work in Chapter 2 indicated that previous research as well as practice have already developed various DP for public SQA. To identify such design principles and determine gaps with regards to the anticipated private SQA applications inside organizations, we conducted an analysis of five popular public SQA on the internet. The analyzed SQA included stackoverflow.com, quora.com, discussions.apple.com, yahooanswers.com and success.salesforce.com. While some of these SQA are business oriented (e.g., stackoverflow.com), others are not limited to a context of question and answers (e.g., yahooanswers.com). We followed three consecutive steps in this SQA analysis. First, we identified all features of the selected SQA sites that related to our MR. Second, we clustered similar features across sites and derived commonly applied DP. Third, we matched the list of design principles with the MR derived from literature to determine whether the DP already addressed the MR completely or if additional DP were necessary to account for the particular requirements of an organizational context. If we identified a gap, we propose additional DP for SQA sites that are deployed in organizations.

4   Meta-Requirements Discovery

4.1   Knowledge Management

To prevent the loss of valuable knowledge, companies rely on strategies to manage knowledge effectively. Knowledge Management (KM) is "…the systematic and explicit management of knowledge-related activities, practices, programs and policies within the enterprise. Consequently, the enterprise's viability depend directly on: (1) the competitive quality of its knowledge assets and (2) the successful application of these asses in all its business activities […]" [36]. The KM process consists of knowledge (1) collection, (2) storage/retrieval, (3) transfer and (4) application [37]. Previous research provides a vast body of knowledge on collection, storage/retrieval and transfer. However, as Choi et al. state "… no matter how much knowledge is shared among team members, it cannot enhance team performance unless it is effectively applied" [38, p. 866]. Research on KM systems suggests that knowledge application increases, if the provision of knowledge is tailored to actual user needs – in particular to users' actual business process [39]. Consequently, we suggest that the (1) collection, (2) storage and especially retrieval, and (3) transfer of knowledge in a user-to-user support platform must be aligned to current user needs in order to enable knowledge application. This requires that the system be aware of the business context the knowledge is applied.

MR1: A user-to-user support platform should monitor the user context in order to provide access to knowledge based on current needs.

Before the emergence of Web 2.0 applications, many companies relied on technologies such as databases or repositories in order to collect, store and transfer knowledge. However, many researchers like [40–42] realize that such central storage locations are used only seldom. Instead, they discover that individuals prefer to exchange their knowledge in direct communications [40]. Since organizational learning relies on externalization of knowledge, companies need to implement both, documentation of knowledge for indirect knowledge exchange, and multiple communication channels to enable direct knowledge sharing [43].

MR2: A user-to-user support platform should provide integrated access to knowledge both, externalized in documents and provided by experts.

4.2   Social Presence

Social presence (SP), i.e., the feeling of human warmth and sociability based on the presence and perception of social cues [44], plays a major role in SQA. In contrast to face-to-face interactions, few social cues are available in online environments. Moreover, high anonymity leads to various negative effects for interpersonal relationship and community formation [45, 46]. As a consequence, many people desire online environments to be social as "social cues, such as pictures, can increase positive impressions of group communication (such as online discussions) and elicit warm feelings, causing users to have a more satisfying experience" [47, p. 9]. While SP can be designed [48], e.g., by providing options for using higher media richness such as profile pictures, in user-to-user platforms the users themselves have to act (e.g., use emoticons) in order to re-embed social cues [49]. Besides a feeling of a social environment, trust [50] and enjoyment [51] are further positive outcomes of SP.

While user-to-user support platforms are mainly designed to ask and answer questions, users also care about the impressions they make. Thus, beside the task-oriented character of SQA, presenting oneself and forming impressions is done by users intentionally and unintentionally [52]. One of the basic design elements of SQA is the user profile which gives room for self-expression [15, 53]. However, SQA may allow users to also ask questions anonymously. While pseudonyms or real anonymity may help to lower the barrier to ask questions [54], anonymous postings lack social cues and subsequently desirable outcomes of SP. Many studies show that social cues let others make judgments about others' personality and perceived SP subsequently [55, 56]. Therefore, we derive the following design principle:

MR3: A user-to-user support platform should stimulate users to include many social cues in their user profiles by providing users enough room for self-expression.

While insights from the field of KM show that direct user-to-user communication is demanded, in terms of SP, the question is how this communication is specified. Studies have shown that direct communication which includes more social cues can positively benefit from SP [44]. However, high levels of SP might not always be necessary to accomplish a solution for easy to solve problems. For example, a simple information transfer through text-messaging can be sufficient [53]. As a result, SQA should intend to provide the best technical mediation for the interacting partners.

> MR4: A user-to-user support platform should provide options for direct user-to-user communication that reflect the continuum from basic text message functions up to the technological state-of-the-art.

4.3   Gamification

Deterding et al. [57, p. 10] define gamification as "the use of design elements characteristic for games in non-game contexts". In terms of SQA, gameful design elements are often used as interface design patterns like badges, leaderboards or level rankings [57, 58]. Since user participation in online communities is often carried out by only a small percentage of the overall users [23, 59], the gameful design is used in order to foster user participation and promote quality contributors. In SQA high participation and high willingness to share knowledge is essential. Wasko and Faraj show that people share their knowledge, if they perceive that sharing increases their professional reputation [60]. To this end, gameful design elements, that increase the reputation of users, are likely appropriate to support knowledge sharing in SQA. However, a careful design is necessary to harness the benefits of gameful design elements [58].

> MR5: A user-to-user platform should include gameful design elements that activate user behavior to support the use objectives of the platform.

In SQA it is particularly important that experienced users share their knowledge with the questioners. Welser et al. notice that users with many contributions do not necessarily provide value for the community in terms of knowledge sharing [61]. Consequently, gameful design elements for SQA must consider the quality of contributions as a crucial factor thereby an obvious target conflict between the individual and the platform operator exists. While knowledge seekers are motivated intrinsically to use the platform (motivated by receiving an answer to their question), special attention must be paid to motivate experts to contribute [62]. In the consumer sector, this is done by providing special services to please the best customers. In doing so, organizations use gameful design elements to enrich their services in order to influence user behavior [62]. For example, clothing stores offer special shop hours for premium customers or aviation companies provide special service like lounge entry or food selection for frequent travelers. In this sense, the application of gamified services could also be used in SQA for attracting experts to share their knowledge.

MR6: A user-to-user platform should provide gamified services that lead to a new cognitive, emotional, social use of the core offer.

4.4 Social Network Theory

User-to-user support is based on knowledge exchange among users and, thus, can be considered a social network. Similar to SQA, one important aspect of social networks is participation, which goes along with the overall long- and short-term success of the platform [63]. Social network operators actively try to foster participation by establishing a close connection to the users over various communication channels, e.g., notification by email. These notifications have been found useful to increase participation in social networks [64]. In order to guarantee a rapid progress in the question-answer cycle, i.e., from the initial question until the approval of the best answer, a SQA may overtake this principle to provide real-time mechanisms to send user notifications.. There are multiple ways how such a feature may be implemented. For instance, notification icons that flash when a new answer or a comment is given to an asked subscribed question are quite common. Other possibilities to establish near real-time communication are notifications via RSS feed or email [65].

MR7: A user-to-user support platform should inform the users about changes in order to speed up the support process by pointing out recent changes.

Another striving feature of social network is self-regulation. For example, this can be achieved by dedicated moderators who can delete or re-categorize questions [29]. In addition, the task may also be accomplished by active and encouraged users who flag redundant questions or merge them together. Beyond that, normal users, in the role of an evaluator, may be provided with the opportunity to report abusive behavior [66]. It has been shown, that measures of self-regulation are beneficial in the context of SQA sites [67]. Thus, it may be considered as MR for user-to-user support.

MR8: A user-to-user support platform should implement measures for self-regulation in order to increase the overall quality of both structure and content of the support requests and answers.

5 Analysis of SQA Tools

In our analysis of popular SQA, we identified 27 DP. Table 1 summarizes the DP and relates them to the formulated MR. An "x" indicates that the DP is used to influence user behavior in the corresponding SQA.

The analysis shows that SQA already apply many DP related to the MR that were derived from the kernel theories. However, we argue that not all DP can be transferred simply to an organizational context without modifications. An analysis of possible modifications and extensions is presented in the following chapter.

Table 1. Overview of design principles used in popular SQA

MR	Design principles	SO	YA	SF	QR	AP
MR1	Follow watchlist to enable reuse		x	x	x	
	Reputation bounties to motivate use	x				
	Integration into work context			x		
MR2	Answers can be weighted	x	x	x		x
	Questions can be weighted					x
	Experts are exposed (e.g., through badges)	x	x		x	
	Direct communication			x	x	
MR3	Pseudonyms as user names allowed	x	x			x
	Free choice of profile picture	x	x	x	x	x
	Text fields to provide personal information	x		x	x	x
	History of user activities	x	x	x	x	x
	Links to users other profiles (e.g., twitter)			x	x	
MR4	Direct text messaging			x	x	
MR5	Badges	x		x		
	User level system		x			x
	Point system	x	x	x		x
	Number of contributions in user profile	x	x	x		x
	Leaderboard	x	x	x		
MR6	Privileges for users with more points	x				
MR7	Notification icon	x	x		x	x
	Sharing of posts		x	x	x	
	RSS feeds	x	x		x	
	E-Mail notifications	x	x		x	x
MR8	Question improvement (by another user)	x			x	
	Answer improvement (by another user)	x			x	
	Community tagging	x			x	x
	Report abusive behavior		x			

SO = stackoverflow.com; YA = yahooanswers.com; SF = success.salesforce.com

QR = quora.com; AP = discussions.apple.com

Table 2. Additional design principles for user-to-user support in an organizational context

MR	Additional design principles
MR1	Business process integration
MR2	Integration with internal knowledge bases
MR3	Post questions anonymously
MR4	Direct audio- or video-chat
	Collaboration support (e.g., screen-sharing)
MR5	Quality emphasis of game-based elements
MR6	Gamified services combined with real life
MR7	Integrate with enterprise social media, rather than with public social media.
MR8	Establish user hierarchy

6   Discussion and Conclusion

This paper investigated design principles for user-to-user support platforms in an organizational context. From four kernel theories, we derived eight MR. By researching public web-based SQA, we found a set of DP that address the MR. Based on our analysis, we suggest additional DP for user-to-user support platforms that take into account the specific requirements of an organizational context. A summary of suggested design principles can be found in Table 2.

MR1. The detection of the overall context is necessary to provide knowledge that is adapted to user needs [39]. For example, Salesforce puts questions and answers in a particular context of development. An indirect form of context-awareness is the inclusion of follower or watch lists. By putting questions and answers in an entire stream of previous issues, users can understand current questions easily and adapt their answers accordingly. However, none of the SQA under investigation is embedded in actual working process of its users. Each platform is realized as a standalone application forcing users to interrupt their actual activities in order to ask questions or provide answers. In consequence, users are exposed to media disruptions. While it is difficult to define a comprehensive process embedment for public SQA, processes are defined within the context of an organization. In order to enable efficiency and decrease the amount of media disruption, we argue that such a DP will increase the value of the SQA.

MR2. All investigated SQA provide access to expert knowledge in the form of previous discussion streams. By asking questions open to an entire community, indirect communication between knowledge seekers and experts is enabled. In addition, weighing questions and answers enable users to get a quick overview on those comments that are most important or helpful. In organizations, however, many answers to questions are already captured in company-wide knowledge repertoires. While none of the SQA platforms include such externalized knowledge, the implementation of an organizational user-to-user support platform needs to consider existing internal knowledge bases enabling users to connect their questions and answers to externalized knowledge [43].

MR3. Creating answers and questions under a pseudonym is allowed for most of the analyzed SQA. However, none of the platforms allowed anonymous questions, since users had to register with their name and email address. In an organizational setting, anonymity, as a way to lower the barrier for asking questions [54], might be even more important, for example, people do not want to appear as incompetent, are afraid of mobbing or consequences of critical questions. While there were restrictions on user names, for profile pictures no obvious restrictions seem to be in place. Also, providing text-fields for self-expression ("about me") seems to be a standard feature. Less frequent was the option to make connections to users other profiles such as Facebook. Finally, histories of user activities (e.g., recently answered questions) were implemented in every platform. For an organizational context, room for self-expression and showing user activities is also important as this may increase SP and subsequently a climate of trust [47].

MR4. As SQA are mainly designed for public discussions, little direct communication measures were implemented. Other than Salesforce and Quora, no platform included direct user-to-user text messaging. In both existing cases, there were no features for self-expression such as emoticons, choice of fonts or text colors. More advanced direct communication functions such as video-chat, screen-sharing or remote desktop control could not be identified at all. In an organization, such features might be more important and used: Colleagues might be more willing to take the effort to work through a problem together (e.g., by having a shared-screen session). Credits taken and reputation gain is less virtual than in public SQA and might even help in being promoted. Colleagues also likely have no motives to harm (e.g., via a remote desktop session) [45, 46]. Also, the necessary IT infrastructure (e.g., webcams) might be implemented more easily under the lead of an IT department.

MR5. Besides Quora, all investigated SQA include gameful design elements to influence user behavior. It can be assumed that most of the badges, point and level systems are applied to motivate user participation. As public SQA strive for maximum participation, an organization should put emphasis on knowledge retrieval, transfer and application [37]. Thus, in an organizational setting the adjustment of such game-based approaches differs from public SQA. In particular, we argue that it must be ensured that people do not waste their working time to make contributions without value [61], just for gaining reputation in the gameful logic of the SQA. In this sense, in an organizational setting, game-based elements should focus more on quality than quantity adapted to the needs and goals of organizations and their members.

MR6. Gamified services in the SQA could be rarely identified in our analysis. This is likely due to the fact that public SQA have only a virtual binding to its users, so that a provision of real services can also only apply virtually. In an organizational context, the importance of the SQA can be enhanced by offering services that tackle the real world of contributors. For instance, an organization can award real badges instead of virtual ones. Moreover, organizations that want to foster knowledge transfer may even grant extra work hours for expert users so that they are relieved from other work duties. Here, the core service of more flexible work hours is enhanced with gameful experiences in the SQA that support the user's value creation [62].

MR7. All analyzed platforms have implemented some DP to point out recent changes to the users. Apart from Salesforce, all sites featured notification icons as well as the possibility to be notified by email or RSS if new posts or comments are added. In addition, several platforms allow users to share content on social media sites like Facebook or Twitter. This can be seen as an additional mechanism to keep users informed and, thus, to speed up response times and foster participation. However, in an organizational context, it has to be argued that this type of social media integration is likely to be unwanted by the enterprise as it would encourage employees to check their private accounts at work. Here, integrating the newsfeed with internal company portals or, if used, enterprise social media, may be more promising.

MR8. With respect to self-regulation, the platforms under investigation differ significantly. While Salesforce and Quora have implemented DP that allow other users to improve questions and answers as well as to tag existing posts, Yahoo Answers only allows users to report abusive behavior. Salesforce on the other hand did not allow for any self-regulation. In an organizational context, this aspect of self-regulation needs to be carefully considered as users are likely to know each other and may also be located on different hierarchy levels within the company. Thus, if usernames are tracked, this may lead to interpersonal issues affecting the working environment. This is highly dependent on the organizational culture. Here, allowing for anonymous change requests or assigning dedicated moderators (e.g., from the IT department) could help to overcome the issues.

Limitations and Outlook. Our study is beset with several limitations. First, our selection of relevant theories for the derivation of meta-requirements is not conclusive. While we believe that focusing on theories in the context of social interaction is a valid approach for identifying important aspects for a user-to-user support platform, other theories may have been used which would have led to a different set of MR and, thus, DP. Second, we only analyzed a small set of the SQA platforms currently available online. Therefore, it may be the case that some of the discussed improvements and current gaps are already addressed to some degree by other platforms. Future studies could target these limitations by incorporating other theoretical perspectives and expanding the number of analyzed platforms. In addition, research could focus on evaluating the potential of the discussed additional DP (e.g., process embedment or collaboration support) to improve the support process.

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