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Design as Common Good

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Digital collaborations for the common good: key learnings from four community projects

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Abstract | In this research we are concerned with how to make people collaborate for the common good in digital platforms, how to raise empathy, how to create, motivate or manage initiatives for common good, how to encourage responsibility to engage people with problems. To investigate this, we analyzed four digital collaborative projects found in the literature to understand how the collaboration is mediated and to examine their opportunities and challenges. The four online communities investigated are collaborations *as* and *for* common good: the first is a time-bank (Case 1: C1), a platform where the unit of exchange is not money, but time. The second is about Wikipedia (C2), where users are building an open encyclopedia by indexing information and making it available to internet users. The third has to do with users' participation in open-source software (C3), designing together and making it openly available. And the fourth is about some crowdsourced science platforms that involve people in species digitalization of irreplaceable data (C4), given the unprecedented biodiversity loss. The analyses of the cases were done through the lenses of a theoretical framework for collaboration in immersive environments which helps us to better understand the different factors affecting the collaboration. Revealing how those factors play a role in each case allows us to understand how to encourage and facilitate digital collaborations.

Keywords: digital collaboration, collaboration, common good, community

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1. Introduction

Times of Anthropocene and Capitalocene require unexpected alliances, collaborations, to effectively address public matters (Haraway, 2016). In this research we are concerned with how online communities collaborate for the common good. To address this interest, we segmented this article in two main sections: the first section discusses some theory about common good and collaborations as presented by science and technology studies' authors. There we explore some significance of collaborations *as* and *for* common good, supported in some analysis of practices of individualization, we analyze their analytical implications and material consequences. And we conclude this part by pointing out the potentials and the necessity of collaboration for the common good. In the second section we do a cross-case analysis, we reviewed four digital collaborations taken from literature to try to understand how the collaboration is mediated and to examine their opportunities and challenges.

2. Theoretical background: common good and collaborations

In this article we analyze four cases taken from literature, four collaborations *as* and *for* common good. We are concerned with those two senses. Collaborations *as* common goods are present in the work of the four communities, we are going to analyze whose products are openly available, there common good is about shared property, a sense widely researched by scholars involved in common's movements (Coriat, 2015). However, the second sense was even more interesting for us, collaborations *for* the common good, there common good is about the benefit of collectives. This second sense is a bit redundant, well-being is not an individual matter, one cannot complain about insecurity on the streets without facing inequality and precarisation. COVID showed us how much our health is related, the argument of the individual liberty to not wear a mask ignores that interdependency. Even if "collaboration for common good" seems redundant, individualization continues shaping our politics and knowledge practices, so it is still necessary to stress its importance. Some authors have criticized practices of individuation in different fields from social sciences (Escobar, 2018, p. 83), population genetics and neo-classical economy (Tsing, 2015, p. 28), biological sciences and philosophy (Haraway, 2016) and even quantum physics (Barad, 2007).

But then what does it mean to say that "we are not individuals?" Here we want to foreground two senses of this claim. The first has to do with what constitutes a unit, a unit is a contingent concept, things are made or make themselves a unit, a different constitution of a unit is always possible, there units are heterogeneous assemblages of contaminated diversity (Tsing, 2015, pp. 33–34). And even when care practices are done individually it is always interconnected with collective endeavors (Puig p.133-136). As soon as interdependency is accepted as a condition (Escobar, 2016, 2018), that nothing holds together without agency of care (Puig de la Bellacasa, 2017), care becomes an ethical obligation. The idea of interdependence is crucial because even when death is necessary for

the continuation of life, when interdependence is recognized, one can notice how there are not some individuals dying, there is mass-extinction of entire ways of living. Anthropocene or Capitalocene is not the killing of some units, in the words of Tom Van Dooren and Deborah Bird Rose, double death (Haraway, 2016), the killing of the ongoingness.

In this context, collaborations are crucial because they have the potential to address the two components of response-ability, a praxis of care and response: the first, being able to notice (Haraway, 2016, pp. 34–36; Tsing, 2015), and the second, being capable to respond (Haraway, *Staying*, p. 78) becoming capable with others (Despret, 2008; Haraway, 2016). Aligned with the first component of response-ability, collaborations can be transformative encounters, and is not about showing the own's truth to the others with their beliefs, the world is full of people who believe that others believe passively and wrong (Despret, 2008), nor pretending to fully understand the others. We should not expect collaborators to articulate their thoughts the same way. Collaboration does not necessarily imply consensus, is not about agreement, nor about convincing. The noticing of the transformative encounters we talk about are made by asking questions together, in Marilyn Strathern's terms putting relations at risk with other relations (Haraway, 2016, p. 12), our assumptions with those of others. It is a possibility to think from below (D. Haraway, 1991; Harding, 2015).

And collaborations are not innocent alliances, hidden interests and power relations do not simply disappear because of the cooperation. Collaborations have the potential to, but not necessarily lead to transformative encounters and alliances to become capable to act responsibly. It is not that every collaboration leads to a better situation, but they are necessary to survive (Tsing, 2015, p. 30). Collaborations are not altruist, nor utilitarian, they are about mutual obligations (Puig de la Bellacasa, 2017).

In synthesis, collaborations are necessary for the common good, well-being is not about individual interests. Instead, individualization is double death, the killing of the ongoingness. Collaborations have the potential to be “transformative encounters” to notice, to think with others, even to “think from below”, and are also important to render capable with others. That's why collaborations are key for common good. In a landscape of naturalization of individualization, we outlined in the previous part, the fact that entire online communities are formed investing their time and effort to collaborate, to become a community with others would have to be explained, at least it would deserve some of our attention. In the next part we are going to analyze four cases of digital collaborations taken from literature, there we want to think how to better collaborate for the common good in the context of online communities.

3. Materials of analysis

While doing a systematic literature review about digital collaborations, we found four articles especially suitable to think about digital collaborations *as* and *for* the common good.

The first is about a time bank, the second is about a wiki, the third is about open-source projects, the fourth case is about citizen science. Each case is also attached to a collaborative paradigm already explored both in practice and in the scientific literature. Even if we are not going to discuss the history or in general about those paradigms, it is important for us to notice how those are not isolated cases.

Within our search we did not find a model that conceptualized the elements of a collaboration, just research that focused on some aspects of them. But we know the ICE (Immersive collaborative environment) model was made to conceptualize and measure collaborations mediated by immersive environments and thus digital technologies. The model (Dupont, Pallot, Christmann, & Richir, 2018; Dupont, Pallot, Morel, Christmann, & Boly, 2017; Pallot et al., 2017) has two parts, one concerned with immersion and the other with collaboration; is the latter we are going to discuss here (when we refer to the ICE model in the text we will be talking about the collaborative component). For the collaboration component the model proposes four elements, each of them with two properties: Sense Making (SMa): Relevance (SMaR), Context Awareness (SMaCA); Trust Building (TB): Interpersonal Ties (TBIT), Confidence (TBC); Shared Meanings (SMe): Knowledge Sharing (SMeKS), Knowledge Creation (SMeKC); Mutual Understanding (MU): Group Dynamics (MUGD), Collective Intelligence (MUCI).

4. Cases analysis

Given the fact that this model was not made for digital collaborations in general, but for immersive technologies, in this article we want to try to take the four cases' discussions in terms of the model to know if it fits and in consequence, if the model can be used to describe and quantify digital collaborations in a wider sense. Not all the elements of the model are present are analyzed by the authors of the articles we selected to study the four cases (see Table 1), so in this article we analyze each case with one of the four elements of the model.

Table 1. The ICE Model elements present in each case. The x's indicates that the element is explicitly present in each article.

Element	Property	C1	C2	C3	C4
SMa	SMaR		x		
SMa	SMaCA		x		x
TB	TBIT		x	x	
TB	TBC				
SMe	SMeKS				x
SMe	SMeKC		x		x
MU	MUGD				x

MU	MUCI	x	x	x	x
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4.1 Time republik - Time based currency

Time banks are time-based currency communities, all time banks share the same schema: “an-hour-per-an-hour” (Del Moral & Pais, 2015), members use time instead of cash as a unit of exchange. TimeRepublik in particular is a digital time bank, a community of people who freely exchange their talents, interests, and passions. In Timerepublik users can offer time doing things like giving French classes, repairing electronic devices, taking photos, etc. In *Collaborative Economy and the Digitalization of Timebanking*, (Del Moral & Pais, 2015) focus on a particular time bank, Timerepublik to analyze some differences and similarities between digital and traditional time banks. In the analysis of this case, we focused on the element of mutual understanding of the ICE model, who’s interest in power relationships resonates with the debate the authors of the article propose to think if digital time banks are or not and to what extent they can disrupt capitalist dynamics of exchange.

Time banks such as Timerepublik, a digital one, have significant differences compared to traditional ones. In Timerepublik exchanges are much more professional or working-life oriented (Del Moral & Pais, 2015, p.9), there are many young (67% of members under 34 years old) professionals and high-skilled people (Del Moral & Pais, 2015, p.6), there is a high rate of short exchanges (38% of them last less than an hour and 16% just 15 minutes or less) (p.9) and the size of the network is considerably bigger, in just one and a half years, 12.000 people have registered (Del Moral & Pais, 2015, p.10).

From the beginnings of the idea of Time banks, they have been engaged with socio-political concerns (Del Moral & Pais, 2015, p. 4). It has been said that they have the potential to turn inside out the very definition of work and its value, to blurry boundaries between what is considered work and what is not, what is valuable and what is not (Del Moral & Pais, 2015). This communities have been described as predicating ethics of sharing far from capitalistic, this more concerned with the communal (Del Moral & Pais, 2015, p. 12), or destabilizing the association of “economy” with capitalism (Del Moral & Pais, 2015, p. 12). On the other hand, there are critical approaches that describe those initiatives as built upon a business-as-usual foundation: private ownership, funded by venture capital, without any special concern with well-being, community cohesion, local economic diversity, and sustainable job creation (Del Moral & Pais, 2015, p. 12). Even considered the latest capitalism’s trick to survive, even if it could accelerate the phenomenon of real wages stigmatization, job destruction and destruction of basic structures of welfare (Del Moral & Pais, 2015, p. 12).

In this article the authors show how differences in mediations (traditional versus digital) can represent differences in the kind of members and exchanges. In relation to the capacity of these banks to destabilize the dynamics of the capitalist economy, taking into account the criticisms, we consider that the time banks do not represent an absolute disruption of these

conventional dynamics, but they can produce new relations of access to things that people could hardly afford with money, time banks also allow new relationships between their members.

4.2 Wikipedia - Wikis

In *Information Quality in Wikipedia: The Effects of Group Composition and Task Conflict*, Arazy, (Arazy, Nov, Patterson, & Yeo, 2011) ask: what determines the success of community-based collaboration projects? to answer the question they examine the relationships between the cognitive diversity of members' knowledge and experiences, task conflict and roles members play in the community, this interest fits well with the Sense making element of the ICE model. The researchers focus their study on Wikipedia, an online encyclopedia that is experiencing remarkable growth and has become the most notable example of the community-based model (Arazy et al., 2011, p. 72). There are different roles in Wikipedia (Arazy et al., 2011), administrative-oriented participants tend to have high commitment and identification with the community and are highly engaged in the community in contrast to content-oriented participants. The contribution of content-oriented participants is centered on few items while administrative-oriented work is distributed across many items.

Cognitive diversity describes differences between mental models and common task knowledge (Arazy et al., 2011). This kind of difference has been described affecting positively team success and enhancing group's performance, by increasing the variety of perspectives, creating opportunities for knowledge sharing and leading to greater creativity.

Task conflict has been described as both affecting negatively and positively collaborations (Arazy et al., 2011). When negatively described, task conflict is impeding collaboration, escalating minor disagreements to heated debates, and being perceived as detrimental to productivity and satisfaction. When positively described, task conflict can contribute to a group's performance, making members more receptive to new information, fostering a deeper understanding of task issues, increasing the range of possibilities considered, motivating members to question fundamental assumptions, and leading to enhanced problem solving.

Researchers selected randomly selected articles between 200- and 3500-words length. There were taken from 15 to 17 articles from the six subject categories from Wikipedia's classification, a total of 96 articles were analyzed. The article's quality was measured with the help of librarians, who were asked to evaluate the articles with four evaluation criteria: accuracy, completeness, objectivity and representation. The group's members' orientation was measured by analyzing the dispersion of the users' activity, content-oriented members edit few related articles while the administrative-oriented members' contributions are spread between different articles. Cognitive diversity was estimated by comparing the articles edited by each member, when there is a strong overlap between the articles edited by participants, there is less cognitive diversity, if there is no overlap between the articles,

there is huge cognitive diversity. The task conflict was measured studying the articles' discussion page, with the Jehn and Mannix scale (Arazy et al., 2011, p. 83).

The results of the analysis demonstrate that the interaction between cognitive diversity and task conflict was statistically significant (Arazy et al., 2011). When there is high cognitive diversity, task conflict results in improving the article's quality, in contrast, task conflict where there is low cognitive diversity can be detrimental for the articles' quality (Arazy et al., 2011).

4.3 Sourceforge – Open-source

Interested in open-source communities that collaboratively develop software for open access, in *Continued Participation in Online Innovation Communities*, (Zhang, Hahn, & De, 2013) analyze the influence of community response on members' continued participation among members with different roles. Community response can be strongly influential to the involvement of participants in online communities. In this text, we focused on the role motivations identified by the authors play to maintain relations of collaboration that coincide with the element Trust building element in the ICE model.

In previous research the community's response has shown to improve the continued members' participation (Zhang et al., 2013, p. 1114). But participation objectives and motivations are different between users and modifiers (Zhang et al., 2013). Users participate to gather information, request assistance with the setup and use of the software, report problems with it, and provide feedback about it. Modifiers seek to customize the software code to satisfy their software needs, obtain personal enjoyment from performing an intellectually challenging activity, improve their skills, their status and reputation (Zhang et al., 2013). To study empirically the effect of community's response over the continued participation between different members, researchers took data from the online discussion forums of the website sourceforge.net. There were collected a total of 5641 thread-initiating messages (the first message in a discussion thread), the responses from other members and the replies from the thread-initiating user. Member's roles were assumed based on associated activities. User activity is associated with general questions about the software/project, requests for help, for information and problem/bug reports (Zhang et al., 2013). The modifier role is associated with "activities such as contributing code and asking questions about modifying code" (Zhang et al., 2013).

The variables Recent Community response, Time to return and Cumulative Response were measured based on the data from sourceforge.net (Zhang et al., 2013). The recent community response is "a binary variable capturing whether the focal message had received a valid response before the member posted a subsequent message or before the end of data collection" (Zhang et al., 2013). Time to return is "the value of the time (in days) from a member's posting of a thread-initiating message to his posting of the next message. If the member did not post another mess" (Zhang et al., 2013). Cumulative response is "the

cumulative replies that the member received from the community in response to his past thread initiating participations” (Zhang et al., 2013).

The analysis results suggest that the recent community’s response has a positive effect over the continued participation in the community. Authors highlight the role played by the community response attracting continued participation notably for users of the software (Zhang et al., 2013). This case shows how important is the community’s response to motivate the continued participation.

4.4 Software to involve citizens in science tasks - Citizen science

In *Accelerating the Digitization of Biodiversity Research Specimens through Online Public Participation*, (Ellwood et al., 2015) reviewed different online platforms to digitalize specimens. Interested in the so-called *citizen science*, the involvement of citizens in science tasks, they review, identify and propose standards and good practices. For the digitalization, it is needed to transcribe annotations found on the records (with information related to characteristics, classification and location). This process can include a wide range of activities, the authors focus on three tasks: transcription, georeferencing and annotation, here we are going to talk exclusively about georeferencing. In this text, we focused on the importance of required mediations that make possible collaborative activities like georeferencing, that overlaps with the interest in the building of common frames of reference to allow common functioning described by the element Sense making in the ICE model.

Based on comparison between different platforms and some standards, the authors suggest some considerations (Ellwood et al., 2015): First, to train participants on basic skills such as identifying the locality information and interpreting locality types, interpreting geographic jargon, compass bearings, abbreviations, and formats, and understanding the common types of geographic projections, etc. Can lead to more efficient and accurate results. Training emphases can be placed on finding and using relevant maps and indices of place names. Second, familiarity with the area in which the specimen was collected, and with the language in which the label was written can be also helpful. Third, categorization of data records in administrative units of specimen origin (e.g., country, state, region) is useful for assigning records to public participants. Fourth, to record participants’ performance can be useful to evaluate participants’ georeferencing skills. Fifth, to do a threshold based on the work of multiple participants can lead to more accurate results.

This case shows how standardization of the activities allow the coordinated functioning, the collaboration of the community. Tasks such as georeferencing require participants to make use of technical standards, part of the problem with these standards is the fact that they cannot be easily understood by non-expert community members. Their strategies as doing a previous categorization of data records in administrative units as country, state or region can be useful. So, standards are at the same time a matter of common functioning and understanding.

5. The elements of the ICE Model in the analyzed cases

Given this ambivalent role of aspects such as standards, cognitive diversity, community response or task conflict evidenced in the cases, we could not do a list of good or bad practices. But the four ICE model elements linked to the collaborative component (Sense making, Trust building, Shared meanings and Mutual understanding) point out some aspects that should be considered when studying, building or maintaining online communities. In general, those four elements suited well with the four cases, and therefore the ICE model can well describe digital collaborations in a wider sense, not just in immersive environments (see Table 2).

Table 2. The ICE Model elements and how they appear in the discussions of the article that presents the case.

	Element	How the element is presented
Case 1	Mutual Understanding: Collaborators participate in being influential with each other without restrictive impositions (power relationships, for example) from teammates	Authors discuss some positions about how time banks can be disruptive to classical economic systems and the power relationships they are attached to
Case 2	Shared meanings: Participants share knowledge to work creatively	Authors discuss the relationships between cognitive diversity, conflict and article's quality
Case 3	Trust building: Team members are supportive and are confident with themselves and the others	In the paper the support is expressed and received as a community's response, and the effect is the member's continued participation
Case 4	Sense making: Participants are aware of the context and comprehend their teammates	Authors discuss the participants' problems with georeferencing

However, there are some aspects that do not fit as well when one wants to analyze online communities as collaborations. The ICE model was made mainly for face-to-face simultaneous collaborations with a reduced quantity of members working on the same object, and the cases studied in this article do not correspond to this kind of interaction. The time-bank case for example, is one of collaboration but not of collaborative work, members of timebanks work together to build a community, but they are not working on a product. In the digitalization of species case, participants do not always work in the same object or at the same time, the object is not a unique object, but there are a lot of records that have to be labeled or georeferenced. The interactions studied were completely online, collaborators did not see their faces and communication was not simultaneous, so a property like relevance, of the element sense making, concerned with the measure in which participants understand each other does not fit well in the case 4 about digitalization of species, because

each participant is working in a different record without contact with other participants. There are also aspects that are central to the analysis but are not represented in the model, that is the case of the Shared Meaning element, concerned with the knowledge sharing to creative work, even if their two properties evaluate if there is exchange of knowledge and if it leads to creative results, the fact that the exchange can be conflictive, and the conflict can be detrimental or productive to the end result is not taken into account.

6. Key learnings

Far from giving answers the four cases open questions around three aspects both difficult to grasp and important to note when studying online communities. We propose those questions to be considered in the specificity of each community. First: Who are the community members? How to classify them? neither community participants, nor their motivations are homogeneous, so it is important to know the participants. The Wikipedia's and open-source cases show how different community members can be (content and administrative oriented, users and modifiers), and the differences in the kind of interactions and motivations they have. The time bank shows how digital time banks can entail different kinds of community members, differences in the duration and kind of exchanges and the size of the network. These are not easy questions since it seems that every classification of participants can be contested for being insufficient to know the nuances of the group formation (Latour, 2005), the cases show and discuss different member segmentations.

Second: How does technology mediate collaborative work? In the time banks case, it can be observed how the difference between digital and traditional can make a difference in the kind of members and exchanges, in the digitalization of species case it was also clear the difference standards can make to the coordination of the work, but also to make some tasks easier. It is important to consider what mediates collaborations, platforms affect actively communities' participation (Latour, 1992; Mitchell & Hansen, 2010), so it is important to note how software features configure interactions. One can do this by comparing the platform with others, looking for standards and good practices or directly by doing research with the community.

Third: How does the quality of interactions affect collaboration? It is important to pay attention to interactions like community response that was shown to be differently motivating to different kinds of members in the open-source case, or in the task conflict (that in the Wikipedia's case can be beneficial or detrimental). Then aspects like community response, task conflict and even cognitive diversity can have ambivalent effects to online communities' collaborations.

References

- Arazy, O., Nov, O., Patterson, R., & Yeo, L. (2011). Information Quality in Wikipedia: The Effects of Group Composition and Task Conflict. *Journal of Management Information Systems*, 27(4), 71–98. Retrieved from <http://www.jstor.org/stable/41304593>
- Barad, K. (2007). *Meeting the Universe Halfway: Quantum Physics And the Entanglement of Matter And Meaning*. Durham and London: Duke University Press.
- Coriat, B. (2015). *Le retour des communs : la crise de l'idéologie propriétaire*. Paris: Les Liens qui Libèrent.
- Del Moral, L., & Pais, I. (2015). Collaborative Economy and the Digitalization of Timebanking: Opportunities and Challenges. *Studi Di Sociologia*, 53(1), 3–21. Retrieved from <http://www.jstor.org/stable/43924067>
- Despret, V. (2008). El cuerpo de nuestros desvelos: figuras de la antropro-zoo-génesis. In *Tecnogenesis, La construccion tecnica de las ecologias humanas* (pp. 229–260). Madrid: AIBR (Antropologos Iberoamericanos en Red),.
- Dupont, L., Pallot, M., Christmann, O., & Richir, S. (2018). A Universal Framework For Systemizing the Evaluation of Immersive And Collaborative Performance. In *VRIC '18: Virtual Reality International Conference Laval Virtual* (p. 10). LAVAL. <https://doi.org/https://doi.org/10.1145/3234253.3234306>
- Dupont, L., Pallot, M., Morel, L., Christmann, O., & Boly, V. (2017). Exploring Mixed-methods Instruments for Performance Evaluation of Immersive Collaborative Environments. *International Journal of Virtual Reality*, 17(02), 12.
- Ellwood, E. R., Dunkel, B. A., Flemons, P., Guaralnick, R., Nelson, G. I. L., Newman, G., ... Mast, A. R. (2015). Accelerating the Digitization of Biodiversity Research Specimens through Online Public Participation. *BioScience*, 65(4), 383–396. Retrieved from <https://www.jstor.org/stable/90007259>
- Escobar, A. (2016). Cosmo/visiones del Pacífico y sus implicaciones socioambientales: Elementos para un diálogo de visiones. *Foros Semana*, 1–17.
- Escobar, A. (2018). *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds*. Durham: Duke University Press.
- Haraway, D. (1991). Conocimientos situados: la cuestión científica en el feminismo y el privilegio de la perspectiva parcial. In *Ciencia, cyborgs y mujeres: La reinención de la naturaleza*. Titivillus.
- Haraway, D. J. (2016). *Staying with the Trouble: Making Kin in the Chthulucene*. Durham and London: Duke University Press.
- Harding, S. (2015). *Objectivity and Diversity Another Logic of Scientific Research*. Chicago and London: The University of Chicago Press.
- Latour, B. (1992). Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts. In *Shaping Technology / Building Society: Studies in Sociotechnical Change* (p. 252). Cambridge and London: The MIT Press.
- Latour, B. (2005). *Reassembling the social: An introduction to Actor-Network Theory*. New York: Oxford University Press.
- Mitchell, W. J. T., & Hansen, M. B. N. (2010). *Critical terms for media studies*. Chicago: Chicago Press.
- Pallot, M., Dupont, L., Christmann, O., Boly, V., Richir, S., & Morel, L. (2017). ICE Breaking: Disentangling Factors Affecting the Performance of Immersive Co-creation

Environments. In *VRIC '17* (p. 7).

<https://doi.org/http://dx.doi.org/10.1145/3110292.3110316>

Puig de la Bellacasa, M. (2017). *Matters of Care: Speculative Ethics in More Than Human Worlds*. Minneapolis: University of Minnesota Press.

Tsing, A. L. (2015). *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruin*. Princeton: Princeton University Press.

Zhang, C., Hahn, J., & De, P. (2013). Research Note: Continued Participation in Online Innovation Communities: Does Community Response Matter Equally for Everyone? *Information Systems Research*, 24(4), 1112–1130. Retrieved from <http://www.jstor.org/stable/24700297>

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