Evaluating Crowdsourced Designs: How Community Shapes New Product Design

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Organisations increasingly initiate and develop crowdsourcing communities based on the needs for problem solving and innovation. The amount and diversity of designs generated on online communities pose new challenges in evaluating and selecting promising ones. This research aims to examine how crowdsourcing community evaluates crowdsources designs, especially what and how social and technical mechanisms in the community affect evaluating practices of designs. Drawing on prior work in design and creativity, and social evaluation, we uncover multiple criteria of defining and capturing value and conducting evaluating practices in crowdsourcing. More specifically, we argue that categorical assignment of a product design affects evaluators' endorsement and this relationship is moderated by designers' cognitive engagement The findings have theoretical implications for crowdsourcing research community and provide managerial insights for organisations engaged in design crowdsourcing practices.

Keywords: product design; crowdsourcing community; evaluation; design innovation

1 Introduction

The rise of the prosumers (Toffler 1980: 265) and the advancement of Internet technology result in vibrant crowdsourcing communities contributing new ideas especially through the web-based platforms (Amabile 1996; Konieczny 2009). Crowdsourcing, coined as a term by Howe (2006), refers to the process of calling for inputs from a large group of people particularly though web-based platforms, which is increasingly applied in generating new designs (Evans et al. 2015; Liu and Lu, 2016).

Design crowdsourcing allows organisations to access a wide and diverse knowledge (Füller et al. 2007) at a lower cost (Nambisan 2002), facilitate new product development and problem solving (Thomke and Von Hippel, 2002), and generate significant commercial benefits for business (Nishikawa et al. 2013; 2017). Whereas third-party design crowdsourcing services are available such as InnoCentive, DesignCrowd and DesignHill, many companies, including LEGO, Threadless and Tokyoflash, have established their own design crowdsourcing platforms (Liu et al. 2019). Yet, the amount and diversity of generated

designs from crowdsourcing platforms pose a new challenge to evaluate and select promising ones and integrate them into organisations' strategies (Eling and Herstatt 2017).

Facing cognitive and attention limitations, organisations start to use the crowdsourcing evaluation to increase the processing ability and reduce costs (Schemmann et al. 2016). They develop communities of contributors and enthusiasts, mobilise them to rate designs, and provide recommendations for improvement, aiming at simplifying and supporting organisations' decision making (Alam and Perry 2002). Previous research is predominantly concerned with two perspectives: first, how crowdsourcing evaluations effectively assess designs' novelty, originality, and usefulness contributing to new product development (Onarheim and Christensen 2012) and second, how to innovate and optimise incentive systems to encourage the participation of the crowd (Dontcheva et al. 2011). While these studies offer significant insights of crowding's instrumental role in design generation and its service to organisations, very limited research focuses on the evaluation stage of crowdsourced designs. It remains unclear how community evaluates designs in a space characterised by shared identity and intimate social relations among design contributors and evaluators (Sukhov 2018). This is not a trivial question for several reasons: first, such communities, after creation, can form their own norms and values that shape external audiences' perception of organisational identity, and influence market receptions of products; second, internal dynamics among enthusiastic contributors can offer invaluable information for organisations to monitor changes of tastes and preferences of users; third, such communities can also provide inspiration and stimulation for organisations' internal procedures and practices of product design and development.

Our paper considers crowdsourcing communities as one type of navigating device that connects innovation with market through generating and evaluating ideas and designs (Araujo et al. 2010). On the one hand, crowd serves as a critical source of innovation with a strong linkage with consumption; on the other hand, it also provides an opportunity for users and enthusiasts to express their passion and engagement. Thus, crowdsourcing practices are instantiations of multiple definitions and orders of worth, including economic, cultural, social and technical values (Stark 2009). Crowdsourcing communities are venues of encounters and interactions between different actors involved in related practices (Collins 2004). We draw on literature from creativity and design research (West and Bogers 2014), and social evaluation (Lamont 2012) and define crowd evaluation is a social process that negotiates intersubjective understanding of designs and creativity in a relational manner. The aim of this study is to understand what makes product designs more attractive than others to community members.

The online community of enthusiastic members provides a unique opportunity to study crowdsourcing evaluation. Since both designers and evaluators are familiar with the firm and its products, and the spirit and lifestyles they present, their evaluations are situationally and culturally bounded. We argue that evaluators interpret product designs by looking for creativity cues (Cronin and Loewenstein 2018). First of all, category research (Hsu and Hannan 2005; Negro et al. 2010) suggests that evaluators use categorisation or classification to understand product designs' meanings and market identities and assess

their intrinsic and actual appeal. If a product design is assigned with many categories, it may confuse evaluators and demonstrate its limited efforts in each of the categories. Consequently, product designs with more categories assigned compared to less categories will receive penalties and worse evaluation (H1).

Product designs presented via online platform as cultural goods are talked about, discussed and communicated through language and pictures (Loewenstein et al. 2012). How both dimensions are presented in the design indicates the level of cognitive engagement of a submitter in the design, and her/his taste and sophistication in understanding the collectively shared identity around the firm (Loewenstein and Mueller 2016). By cognitive engagement we refer to actors' efforts invested in verbal and visual behaviours to present and promote their image publicly (Elsbach 2003). We expect to find textual and visual cues in design descriptions condition evaluators' perception and judgment based on categorical understanding. Thus, we propose that higher cognitive engagement (verbal and visual resonance) mitigates the negative relationship between the number of categories assigned to a product design and evaluations' assessment (H2). Figure 1 shows the conceptual framework of this research.

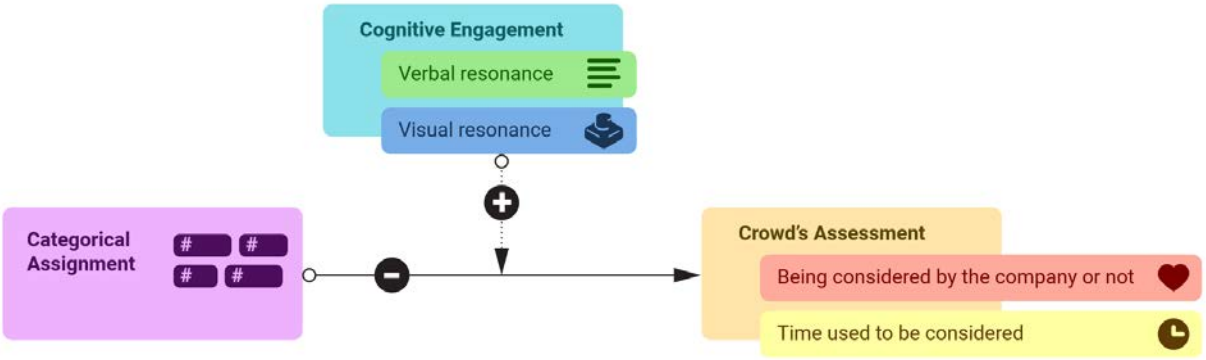

Figure 1. Conceptual framework of this research

2 Research methods

To address the research question, a crowdsourcing community developed and managed by a leading international company in the entertainment sector is investigated. This empirical setting is ideal for our research. First, the successful history of the company was based on providing innovative and creative products. However, a recent crisis has forced the company to rethink and redefine creativity. A crowdsourcing community was developed as part of the reposition attempt to better understand customers and market dynamics. Second, the company has a worldwide customer base that not only buys the products, but also constitutes a community of enthusiastic fans and players. Because of the interactive and experiential nature of the products, customers share the passion in developing new designs. Third, the crowdsourcing community provides a unique space for customers and enthusiasts to generate and play with, and evaluate product designs, and co-develop products with the company. The web-based platform offers a wide array of multimodal information, including

visual, physical, textual, and numerical for our analysis of evaluating dynamics within the community.

The crowdsourcing community provides naturally occurring data covering ideational, interpersonal and textual elements of idea generation and evaluation. We collected all existing product designs in this crowdsourcing platform until August 2018, which led to a data sample of around 2000 designs generated and evaluated by members of the community. This community is a web-based platform, where registered users can post their own product designs and evaluate others. Non-registered users can only browse ideas.

A product design typically consists of following information: the submitter's ID and design submission date, textual description of the design, visual presentation of the design, the update records of the design by the submitter, other users' comments and "likes", and the firm's official comments. To understand how community members evaluate product designs, we use different techniques to explore the rich information provided by the platform. First of all, we coded the textual description of a design by using computational textual analysis to capture linguistic styles and patterns as the text serves as an important communication component to evaluators (Carley 1997). Second, we also coded visual presentation of a design relying on expert raters to assess the content and quality of design components (Kreuzbauer and Malter 2005). In addition, we manually coded the success of each product design – how many supporters an idea gains in a certain time period, and if an idea is chosen by the company or not.

Dependent variable: we are interested in examining what leads to better evaluations. To measure evaluations, we take two different approaches. First of all, we coded whether a product design reached 10000 supporters (a requirement set by the case company). Reaching a certain number of supporters is an indicator of a design\s popularity and marketability. Product designs that surpass 10000 supporters will be chosen by the company for consideration of production. Second, we also counted how many days a product design needed to obtain 10000 supporters.

Independent variables: Categories research has demonstrated that assigning more categories may lead to social penalty because of increasing confusion (Hsu et al. 2009). In our case, a product design may be assigned with more or less tags or categories. For example, a classroom setting may refer to students, teachers, classes, biology, school, etc. We measured *categorical assignment* as the number of tags claimed by a submitter for a design. We coded *cognitive engagement* in two ways. To measure verbal resonance, we used the sociolinguistic – LIWC (Linguistic Inquiry and Words Count, see Tausczik and Pennebaker 2010) to capture words used in the description of each product design. This tool is based on sociopsychological evidence and grouped words in different categories. Percentages of words in cognitive categories are used as a measurement of the level of verbal cognitive engagement. Visual resonance are measured by expert raters' assessment of the quality of various design demonstrations, such as image quality and design details.

Moreover, a number of control variables at the project and submitter level are added in this research. Logit model and ordinary least squares (OLS) methods are applied separately for analysing two dependent variables.

3 Initial findings

We are currently in the process of fine-grained data analysis. Preliminary results provide support to our hypotheses: product designs assigned with more tags are less likely to reach 10000 supporters' threshold. If reached, they used more days to obtain evaluators' endorsement. The abovementioned relationships are moderated by cognitive engagement, so that the higher verbal/visual resonance, the less the negative effect of the number of tags assigned to a product design on evaluation.

4 Contributions to knowledge

This research is an interdisciplinary attempt to study a virtual online community aiming at fostering creativity through the power of social intimacy. This study has important theoretical implications. First of all, it contributes to open innovation literature by elucidating multiple criteria of defining and capturing value. The convergence and divergence in their grammars of worth will advance the understanding of how to organise and structure creativity more effectively. Second, this study advances the knowledge of design generation and evaluations by zooming in onto a small world where contributors and evaluators voluntarily engage in design activities that shape organisational identity. In particular, the multimodality of social evaluations of creative designs are uncovered. Third, this research contributes to interdisciplinary research by showing how design and creativity research and organisational theory research can complement and inform each other. This study also has practical implications. First, it can provide detailed observations of crowdsourcing communities for organisations to test and improve different mechanisms that safeguard and sustain creativity and design innovation. Second, it will showcase different dimensions of design generation processes and patterns, so organisations can learn from the crowd and develop new tools and frameworks to achieve innovative design.

5 References

Alam, I., & Perry, C. (2002). A customer-oriented new service development process. *Journal of services Marketing*, 16(6), 515-534.

Amabile, T. M. (1996). *Creativity in context: Update to the social psychology of creativity*. Hachette UK.

Araujo, L., Finch, J. H., & Kjellberg, H. (2010). *Reconnecting Marketing to Markets*. Oxford: Oxford University Press.

Carley, K. M. (1997). Extracting team mental models through textual analysis. *Journal of Organizational Behavior*, *18*(S1), 533-558.

Collins, R. (2004). *Interaction Ritual Chains*. Princeton: Princeton University Press.

Cronin, M. A., & Loewenstein, J. (2018). *The craft of creativity*. Stanford University Press.

Dontcheva, M., Gerber, E., & Lewis, S. (2011). Crowdsourcing and creativity*. In CHI 2011: Crowdsourcing Workshop* (Vol. 10, p. 4).

Eling, K., & Herstatt, C. (2017). Managing the front end of innovation—Less fuzzy, yet still not fully understood. *Journal of Product Innovation Management*, 34(6), 864-874.

Elsbach, K. D. (2003). Organizational perception management. *Research in organizational behavior*, *25*, 297-332.
Evans, R. D., Gao, J. X., Mahdikhah, S., Messaadia, M., & Baudry, D. (2015). A review of crowdsourcing literature related to the manufacturing industry. *Journal of Advanced Management Science*, *4*(3), 224-321.
Füller, J., Jawecki, G., & Mühlbacher, H. (2007). Innovation creation by online basketball communities. *Journal of business research*, 60(1), 60-71.
Howe, J. (2006). The rise of crowdsourcing. *Wired magazine*, 14(6), 1-4.
Hsu, G., & Hannan, M. T. (2005). Identities, genres, and organizational forms. *Organization science*, *16*(5), 474-490.
Hsu, G., Hannan, M. T., & Koçak, Ö. (2009). Multiple category memberships in markets: An integrative theory and two empirical tests. *American Sociological Review*, *74*(1), 150-169.
Konieczny, P. (2009, March). *Governance, organization, and democracy on the Internet: The iron law and the evolution of Wikipedia*. In Sociological Forum (Vol. 24, No. 1, pp. 162-192). Oxford, UK: Blackwell Publishing Ltd.
Kreuzbauer, R., & Malter, A. J. (2005). Embodied cognition and new product design: Changing product form to influence brand categorization. *Journal of Product Innovation Management*, *22*(2), 165-176.
Lamont, M. (2012). Toward a Comparative Sociology of Valuation and Evaluation. *Review of Sociology*, 38(21), 201–221.
Liu, A., & Lu, S. C. Y. (2016). A crowdsourcing design framework for concept generation. *CIRP Annals*, 65(1), 177-180.
Liu, W., Moultrie, J., & Ye, S. (2019). The Customer-Dominated Innovation Process: Involving Customers as Designers and Decision-Makers in Developing New Product. *The Design Journal*, 22(3), 299-324.
Loewenstein, J., & Mueller, J. (2016). Implicit theories of creative ideas: How culture guides creativity assessments. *Academy of Management Discoveries*, *2*(4), 320-348.
Loewenstein, J., Ocasio, W., & Jones, C. (2012). Vocabularies and vocabulary structure: A new approach linking categories, practices, and institutions. *The Academy of Management Annals*, *6*(1), 41-86.
Nambisan, S. (2002). Designing virtual customer environments for new product development: Toward a theory. *Academy of Management Review*, 27(3), 392-413.
Negro, G., Koçak, Ö., & Hsu, G. (2010). Research on categories in the sociology of organizations. In *Categories in markets: Origins and evolution* (pp. 3-35). Emerald Group Publishing Limited.
Nishikawa, H., Schreier, M., and Ogawa, S. (2013). User-generated versus designer-generated products: A performance assessment at Muji. *International Journal of Research in Marketing*, 30(2), 160-167
Nishikawa, H., Schreier, M., Fuchs, C. and Ogawa, S., (2017). The value of marketing crowdsourced new products as such: Evidence from two randomized field experiments. *Journal of Marketing Research*, 54(4), pp.525-539.
Onarheim, B., & Christensen, B. T. (2012). Distributed idea screening in stage–gate development processes. *Journal of Engineering Design*, 23(9), 660-673.
Schemmann, B., Herrmann, A. M., Chappin, M. M., & Heimeriks, G. J. (2016). Crowdsourcing ideas: Involving ordinary users in the ideation phase of new product development. *Research Policy*, 45(6), 1145-1154.
Stark, D. (2009). *The Sense of Dissonance: Accounts of Worth in Economic Life*. Princeton: Princeton University Press.
Sukhov, A. (2018). The role of perceived comprehension in idea evaluation*. Creativity and Innovation Management*, 27(2), 183-195.
Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of language and social psychology*, *29*(1), 24-54.
Thomke, S., & Von Hippel, E. (2002). Customers as innovators: a new way to create value. *Harvard business review*, *80*(4), 74-85.
Toffler, A., & Alvin, T. (1980). *The third wave* (Vol. 484). New York: Bantam books.
West, J., & Bogers, M. (2014). Leveraging External Sources of Innovation: A Review of Research on Open Innovation. *Journal of Product Innovation Management*, 31(4), 814–831.