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Abstract

In their efforts to understand the process of creating and sharing original new product ideas, designs, and prototypes, scholars and practitioners also seek to learn how external participants might become directly involved in new product development. Open and user innovation (OUI) research in particular has generated unique, interesting insights. Yet most studies focus on certain types of OUI stakeholders, ignoring other relevant stakeholder groups. This article therefore prioritizes understudied stakeholders to clarify how their activities might create value for both customers and the firm. Applying stakeholder theory, the authors extend existing OUI literature by explicating critical stakeholder roles for participants in innovation processes (e.g., creator, contributor, or customer). A proposed stakeholder-based organizing framework clarifies the contributions and gaps that characterize existing research and also reveals promising areas for further research.

New product development (NPD) efforts increasingly expand beyond firms' internal, dedicated NPD teams, as exemplified in the innovation programs hosted by LEGO,[1] Amazon,[2] and General Electric.[3] Popular open source products, such as the Python programming language, Firefox web browser, and WordPress content management system, similarly encourage programmers to make novel modifications to the products' source code; WordPress alone is used by 810 million websites—or roughly 43% of the Internet.[4] Thus, the long-standing tradition that involved keeping NPD research totally in-house is transforming into a business model in which firms actively seek collaborations with external stakeholders (Chesbrough 2006; Stanko and Henard 2017), in efforts to generate value by devising novel innovations.

Academic research into such open and user innovation (OUI) practices in turn appears in multiple business disciplines, including marketing, management, and information science, and relies on diverse methodological and theoretical approaches. Open innovation refers to "a distributed innovation process based on purposively managed knowledge flows across organizational boundaries" (Chesbrough and Bogers 2014, p. 17), such that the concept is primarily an organization-level phenomenon (Bogers et al. 2018). User innovation instead entails participation by individuals or small groups of professional users or end-users, working on a noncontractual basis to develop or improve new market offerings. This approach reflects a clear recognition that users who actively employ a product or service possess invaluable insights, needs, and creative ideas that can drive innovation (von Hippel 2005).

Despite their different levels, the complementarity and synergy between open innovation and user innovation research supports the notion of OUI, as well as its regular applications. For

[1] https://ideas.lego.com/
[2] https://www.aboutamazon.com/news/devices/introducing-build-it
[3] http://www.geappliancesco.com
[4] https://colorlib.com/wp/wordpress-statistics/

example, an annual OUI conference[5] highlights their intersections, and WU Vienna, one of the leading institutes for OUI research, describes the close connection clearly:

> Even though open innovation as coined by Henry Chesbrough and user innovation as coined by Eric von Hippel differ in certain assumptions and research foci, both concepts share the understanding that there is a large amount of creativity outside the boundaries of focal firms that the latter can leverage by applying specific methods and that often users and producers are complements in the creation of innovation.[6]

In turn, researchers often treat OUI as a unified, symbiotic research paradigm; as Alexy et al. (2020, p. 98) put it, "Users innovate. Organizations benefit from opening up their innovation funnels." The two foundational insights for this combination derive from critical work by von Hippel (1976, 1986) and Chesbrough (2003, 2006), which have inspired key developments in how firms conduct their research and development. Accordingly, we define open and user innovation (OUI) as the development of innovations through a creative process in which firms collaborate with multiple stakeholders to generate shared value.

A persistent challenge in this research stream is the lack of cohesion and clear knowledge building, which represents a natural consequence of researchers pursuing insights across various programs and contexts. In an attempt to advance these efforts, we introduce stakeholder theory to OUI literature as a potentially consistent theoretical base. We propose that it can deepen understanding of the nature and connectivity of various OUI concepts and thus lay the groundwork for more focused research advances. In particular, by drawing on stakeholder theory, we can systematically explore the different types of actors involved in OUI processes, the roles they take, and the relationships among the parties, which in turn can clarify the various

[5] https://sites.google.com/view/oui2019/
[6] https://www.wu.ac.at/en/ifsto/research/research-program/open-and-user-innovation-general/

ways value gets generated in NPD (Friedman and Miles 2002). With a systematic review, we identify important stakeholders that participate in OUI processes, according to prior literature. In turn, we undertake a more integrative literature analysis that reveals crucial research gaps, as well as opportunities for further research.

Notably, our initial efforts indicate the vast number of potential players and stakeholders involved in OUI research processes. Most existing literature focuses on stakeholders who participate by creating new product ideas, designs, and prototypes (Bogers et al. 2018; Randhawa et al. 2016). Various studies thus cite the role of external participants in developing open source code (Mallapragada et al. 2012; von Hippel and von Krogh 2003; West and Gallagher 2006), creating original graphic designs (Fuchs and Schreier 2011; O'Hern et al. 2022), or generating novel new product concepts (Allen et al. 2018; Mazzola et al. 2018; Zhu et al. 2017). Although this focus is reasonable and not surprising, it has limited attention to other valuable stakeholders. As a simple example, actors frequently contribute NPD-relevant suggestions or vote on the various ideas generated by creators, yet their role has not been studied sufficiently. More broadly, despite the vast complexity of the innovation process and the different types of stakeholders involved, we lack a dedicated study that explicates key stakeholder roles and examines their relative impact on NPD performance. Thus, we also introduce a new stakeholder-based organizing framework to identify gaps in extant research that should be explored moving forward.

Through these multistep efforts, we determine that stakeholders take three important roles in innovation processes: creators, contributors, and customers. Then we identify three separate types of actors that can take on those roles: individuals, firms, or groups. The proposed OUI stakeholder matrix thus specifies nine distinct stakeholders: individual creator, firm creator,

group creator, individual contributor, firm contributor, group contributor, and individual customer, firm customer, and group customer (Table 1).

<<Insert Table 1 about here>>

In turn, our systematic synthesis reveals that prior literature extensively addresses some stakeholders but neglects others. By analyzing the role adopted by each stakeholder in prior OUI literature, we highlight broad research trends and emerging topics, as well as additional research directions. This categorization approach enables more comprehensive investigations and deeper understanding of OUI, and accordingly, we advocate for the integration of stakeholder theory as a means to address calls for a "stronger theoretical embedding to make sense of and guide research" (Gemser and Perks 2015, p. 665). Furthermore, in line with a call by Hulland and Houston (2020) for systematic reviews to establish the current state of knowledge, integrate and synthesize prior work, and highlight gaps in existing literature, we take a comprehensive stakeholder perspective that reveals both the variety of stakeholders involved and the potential interactions among them. This article goes beyond cataloging existing findings in OUI; it offers an organizing framework to examine varied activities within OUI and identify impactful further research opportunities. Finally, in line with marketing recommendations for theory development (MacInnis 2011), we seek not merely to summarize the field but rather to integrate stakeholders within OUI, by drawing connections among previously distinct phenomena.

Open and User Innovation (OUI)

Many researchers self-assign their work to one of the two prominent research streams that constitute OUI: user innovation or open innovation. According to a search of terms related to open and user innovation, a substantial proportion of research adopts neither term (43.3%), and very few studies integrate them (12.5%). Instead, 31.3% of articles use language corresponding

with user innovation, and 37.9% of them refer to open innovation. Fundamentally though, both open and user innovation are based on the core principle that opening the innovation process to external participants improves access to novel, NPD-relevant knowledge, thereby enhancing firms' and individuals' innovation efforts (Almirall and Casadesus-Masanell 2010; Chatterji and Fabrizio 2014). Still, the perspectives differ slightly in terms of their underlying assumptions and the types of innovation activities on which they focus.

In particular, user innovation activity has always existed, but academic research into it began with pioneering work by von Hippel, then gained particular prominence with the rise of new technologies (von Hippel 1988). A key idea is that users possess more comprehensive knowledge about their own needs than companies do. This concept of information asymmetry suggests that users are especially well-positioned to create new products that meet their needs better than products currently available in the market (Block et al. 2016; von Hippel 2006). Researchers in turn have explored user-driven innovation in various industries and contexts, including medical devices (Hinsch et al. 2014; Lettl et al. 2006), extreme sports equipment (Bråtå et al. 2009), and open source software (von Hippel 2001). Yet this literature stream remains neutral about who benefits primarily from these innovative ideas. Original solutions created by user innovators can be exploited by firms to improve their NPD efforts (Fang 2008), by other user innovators to enhance their own creative pursuits (Goes et al. 2016), or by the user innovators themselves to enhance their own experiences and satisfaction (von Hippel 2001).

Similar to user innovation literature, research on open innovation is predicated on the assumption that various stakeholders can generate novel, valuable innovations. This research domain owes much to the pioneering efforts of Henry Chesbrough, whose 2003 monograph on open innovation spurred significant interest. Following some notable developments, recent

scholarship has defined open innovation as "a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model" (Chesbrough and Bogers 2014, p. 17). Whereas user innovation (by definition) focuses on innovation activity by end-users or professional users, open innovation literature posits that creative solutions can come from a broad range of potential stakeholders, including users, corporate–university partnerships, employees working in non-NPD departments, and so on (West and Bogers 2014). Furthermore, whereas user innovation literature aims to understand how users can create solutions to their own problems and share them with others, open innovation literature explicitly addresses how organizations can use external knowledge to improve their innovation strategies. West et al. (2014) emphasize that open innovation primarily takes the firm's perspective; obtaining new external knowledge resources thus is crucial for driving innovation.

The points of connection between these two innovation research streams are substantial: User innovation literature examines how users create and disseminate innovations, and open innovation literature focuses on how firms can obtain, integrate, and market these solutions to improve their products and financial performance (West and Bogers 2014). By building on prior reviews that investigate how, when, and why innovating firms should engage with external participants, as we detail in Table 2, we seek to extend these considerations by applying a stakeholder perspective and framework. In a co-citation analysis of open innovation literature, Hoyer et al. (2010) establish that a pure focus on the firm dominates, with rare studies of user or community perspectives and emergent textual themes. Gemser and Perks (2015) outline the state of the OUI field, focusing on "who is innovating" but also noting the fuzzy boundary between business-to-business and business-to-consumer innovation, each with its own network or

ecosystem of actors. But as Randhawa et al. (2016, p. 767) caution: "Studies to date have predominantly focused on the firm-centric aspects of OI, investigating knowledge, technology, and R&D from the firm's vantage point. Incorporating network, user, and community perspectives present key avenues for future research to gain a more holistic understanding of OI." Accordingly, and with some practical limitations in mind, we make a focused argument for distinguishing three stakeholder units and three stakeholder roles that consistently emerge as themes in prior literature.

<<Insert Table 2 about here>>

Research Scope

Although OUI can be broad in scope, our systematic review establishes some boundaries that exclude some relatively distantly related bodies of research. Our focus on collaborative, noncontractual innovation between users and firms necessarily narrows our review to the space where user and open innovation literature intersect and accordingly excludes some traditional and formal types of external collaborations, such as interfirm R&D alliances, sponsored innovation accelerators, firms that pay full-time employees to improve open source software products (e.g., IBM), and firms that acquire other firms to access novel, external knowledge resources. Similarly, examples of users innovating completely independently and without any involvement from firms exist, but we do not focus on these types of innovation in our systematic review. Instead, like the OUI discipline itself, we prioritize the substantial overlaps between user and open innovation literature, at the point at which users innovate and firms benefit from innovations. Finally, we exclude literature on co-creation, even though the term sometimes appears in OUI literature, because it encompasses so many disparate and unrelated research streams (e.g., service co-creation, postmodern brand research, CCT). Instead, our research scope

entails the points of intersection among user and open innovation literature streams and the myriad ways that three key stakeholder units (individuals, groups, and firms) might adopt different stakeholder roles (creators, contributors, or customers) to drive value in OUI processes.

Stakeholder Theory

Stakeholder theory emerged in the mid-1980s as an alternative to neoclassical economic theory that suggested a firm's sole responsibility is to maximize profits and deliver above-average financial returns to its shareholders. A key tenet of stakeholder theory is that firms must carefully consider the needs of not only their shareholders but also a wider set of stakeholders, such as employees, channel partners, and community members (Freeman 1984). The meaning of a stakeholder is broad, though a commonly adopted definition refers to "groups and individuals who can affect, or are affected by, the achievement of an organization's mission" (Freeman 1984, p. 52). This argument does not suggest that firms prioritize the needs of other stakeholders over shareholders' needs, but it does imply that a singular focus on maximizing shareholder returns can lead to an inappropriate focus on short-term financial gains and thus an erosion of medium- and long-term firm performance. Stakeholder theory also helps identify relevant participants who previously might not have been considered part of a firm's business processes. For example, suppliers and trade unions can be key participants who help establish a firm's corporate social responsibility footprint (Delbard 2011), and firms also should take the needs of communities into account when making business decisions (Luning 2012). In practice, a stakeholder perspective can be especially advantageous, in that firms can use it to understand the dynamics that influence customer perceptions of the firm, how it should engage with stakeholders throughout the supply chain (e.g., sustainable manufacturing processes), or how it can work with political or cultural stakeholders for the greater good (e.g., support for social

causes; Bhagwat et al. 2020; Hollebeek et al. 2022).

Many stakeholders participate in NPD, and OUI literature has long considered potential developers of new product solutions. This tacit focus on a stakeholder perspective has prompted calls to action in prior reviews, such as when West et al. (2014, p. 809) note, "There is also a need to develop more multi-level perspectives on open innovation. Open innovation may be studied (or occur) at different levels of analysis: individuals, groups/projects, business units, ecosystems/communities, firms, regions or even national innovation systems." Accordingly, we undertook a synthesis approach to reviewing prior literature, with the aim of deepening understanding of OUI topics.

Empirical Review

The breadth and variety of study contexts, research topics, and theoretical frameworks in prior OUI literature necessitate a review methodology that can capture relevant phenomena and trends across multiple related but distinct literature streams. That is, the goal of our analysis is to identify common trends across different research streams and derive a unifying framework for a novel perspective on OUI literature. Systematic reviews, inspired by the field of medicine, "involve a detailed and comprehensive plan and search strategy derived a priori, with the goal of reducing bias by identifying, appraising, and synthesizing all relevant studies on a particular topic" (Uman 2011, p. 57). We thus review multiple related, distinct literature streams that feature different research topics and study contexts while also identifying common concepts and trends in literature that reveal research gaps too (Palmatier et al. 2017).

By following the research collection and analysis protocols used in prior systematic reviews (Tranfield et al. 2003; Watson et al. 2018), we ensure transparency and replicability. As Littell et al. (2008) state, a systematic review "aims to comprehensively locate and synthesize

research that bears on a particular question, using organized, transparent, and replicable procedures at every step in the process." Accordingly, our systematic review proceeds through multiple steps, including an initial search to identify potential studies for inclusion, a screening process that reduces that initial set to a subset of relevant studies, and a study coding process in which we review every study in the final consideration set to identify features relevant to the systematic review. Web Appendices A–C provide the full reference lists of included papers, search themes, and a count of the number of included articles by journal source.

Search

We conducted an exhaustive search of published articles in the EBSCO database, with four search themes that characterize OUI literature, as applied by prior marketing reviews (Watson et al. 2018). Each search theme consisted of multiple potential search terms to capture the wide variety of terminology and lack of cohesive language across different literature streams (Web Appendix A). For an article to be included in the initial search, it had to contain all four search themes that reflect concepts of shared value in innovation, from the perspectives of both customers and firms: (1) customer (10 potential search terms), (2) firm (12 potential search terms), (3) shared value (21 potential search terms), and (4) innovation (11 potential search terms). These terms reflect our systematic assessment of the adopted definition of OUI, common terms in OUI literature, and our own professional experience. With this initial search, we identified 2,694 articles that contained all four search themes.

Screening

To ensure the quality of research studies included in the study, we restricted this data set to studies published in 31 high-quality marketing and business journals, identified according to a combination of impact factors, academic consensus, and the authors' professional experience

(Web Appendix B). In addition to this screening based on publication sources, we reviewed the topics of the remaining articles and eliminated any that did not pertain to OUI. Next, we supplemented the data set with articles that we had identified in our prior reading or that appeared in citations in articles in the data set. With these efforts, we obtained a set 243 articles (Web Appendix C).

Research Topic and Stakeholder Coding

To ensure a formal analysis of the elements of the collected articles, we developed a coding protocol pertaining to stakeholder roles (e.g., individual creator, firm contributor), research topics (e.g., open source, crowdsource, lead user, toolkit), and article features (e.g., journal, NPD stage, research method, analytical approach). These features can be coded efficiently and meaningfully across our large set of articles; we discussed and resolved any discrepancies that arose and thus created a common coding system for all articles. Although our initial coding scheme reflected a broad focus on many different elements of OUI literature, in combining our preliminary coding with the evolving insights from the systematic review analysis, we narrowed the coding to stakeholder roles and units. This narrower coding scheme in turn enables a more focused analysis that can capture critical components of OUI literature.

To ensure accuracy and consistency, we randomly chose a subset of 53 articles from the data set of 243 articles, and each of the four authors independently used the preliminary coding protocol to analyze and categorize the data in each article. Thus, we firmly established a set of common coding procedures and confirmed that all authors shared the same interpretation and application of the coding process. This effort resulted in 19 initial categories, among which the Fleiss's kappa (i.e., measure of interrater reliability) revealed 13 categories with scores greater than .8 (almost perfect agreement), 3 categories scoring between .6 and .8 (substantial

agreement), 3 categories between .6 and .4 (moderate agreement), and only 1 category between .2 and .4 (fair agreement).

Using the thus defined common coding process, each author independently coded a subset of 243 articles, an approach adopted in similar systematic review papers in marketing literature (e.g., Hulland et al. 2018). Figure 1 provides an outline of the systematic review process, and in addition to the empirical findings about the distribution of prior literature pertaining to different stakeholders (Table 1, Panel b), we present insights into each stakeholder next.

<<Insert Figure 1>>

Stakeholder Results

Our systematic analysis of prior literature affirms that OUI generates positive outcomes for stakeholders. But these outcomes vary widely across stakeholders and depend strongly on contextual factors, such as stakeholder traits, firm characteristics, and environmental factors. Stakeholder theory in turn provides a unique opportunity to focus much-needed attention on stakeholders that have not received substantial research consideration.

In OUI, a range of actions can enhance desired NPD outcomes. Unlike traditional NPD practices, these actions might be undertaken by different stakeholders, operating inside or outside the firm. We might outline discrete, unique stakeholders (e.g., governments, universities), but in our effort to establish a systematic framework, informed by stakeholder theory, we instead seek to capture the majority of different types of stakeholders involved in OUI. Accordingly, we identify three key roles for stakeholders in the innovation process: creators, contributors, or customers. Our synthesis also yields three distinct units: individual, firm, and group. Taken together, we thus identify a 3×3 OUI stakeholder matrix. For each stakeholder role (creator,

contributor, customer), three corresponding, distinct units exist, such that creators might be individuals, firms, or groups. In turn, we identify nine distinct stakeholders, which we define next. For each stakeholder role/unit combination, we discuss their presence in OUI literature and broad research trends in that domain. We then note some emerging topics. This categorization scheme facilitates a broader examination of OUI that can, we hope, yield deeper understanding into how each stakeholder engages in OUI processes. Table 3 summarizes the key insights and representative publications pertaining to each stakeholder.

<<Insert Table 3 about here>>

Stakeholder Roles *Creators* actively engage in the creative problem-solving process and are directly involved in developing an innovation. Examples of creators in different OUI study contexts include open source developers who improve a product by changing its source code, as well as crowdsourcing participants who share their original ideas, designs, or new product concepts with the sponsoring firm.

C*ontributors* engage in actions to facilitate or enhance the effectiveness of an innovation program but are not themselves actively involved in creating new product solutions. Some small number of crowdsourcing participants might try to create a new product idea, design, or prototype, but most of them assist the firm in evaluating and selecting the most promising content, such as by voting or commenting on creators' original submissions (Bayus 2013; O'Hern et al. 2021). Similarly, in open source development, contributors provide valuable feedback to creators by requesting new product features or by identifying problems ("bugs") (Kane and Ransbotham 2016; Smith et al. 2017).

Finally, *customers* are end recipients in the innovation process. Although they might not engage in innovation activity themselves, participants who assume this role reap the benefits.

Customers are critical to study, because innovation activities strongly influence their perceptions and behaviors. As Schreier et al. (2012) show, products designed by users can generate higher purchase intentions, willingness to pay, and perceptions of the firm's innovation ability. Insights into how customers react to various innovation activities in turn can provide boundary conditions and meaningful limits to the kinds of innovation efforts that firms should pursue. For example, hundreds of millions of Mozilla Firefox users have never developed their own code, but they enthusiastically use this system as their default web browser; hundreds of thousands of Threadless customers might never evaluate peers' submissions but still will purchase the company's new product offerings.

According to practice-centered truisms (i.e., the 1–9–90 rule), 90% of participants in user-generated communities consume content in relative silence, without creating or contributing to the discussion (*Forbes* 2020). Empirical research into open source (von Krogh et al. 2003), crowdsourcing (O'Hern et al. 2021), and online gaming (Smith et al., 2017) confirms that in many innovation contexts, the number of actors who function as customers dwarfs the number who take on a contributor or creator role. This class of customers thus represents the great "silent majority" that remains almost understudied and poorly understood in OUI contexts. This status justifies and highlights the need for dedicated investigation of their role as OUI stakeholders.

Stakeholder Units *Individuals* are single persons who engage in one or more aspects of the innovation process, such as a game modification developer writing code to change the functionality of a game or a *Threadless* enthusiast who derives value from voting and commenting on designs posted by the firm. For our purposes, we define a *firm* in line with traditional notions of a business or entity that seeks profits/revenue/value and, in our case, also is dedicated to pursuing innovation-related tasks. Firms can take different roles in the innovation

process, such as by developing and releasing toolkits for other creators to use, or else marketing open source products created through various innovation processes. Finally, we define *groups* as multiple individuals organized for the purpose of engaging with innovation-related tasks or consuming OUI developed innovations. Examples include collections of open source developers who work together as a team and online communities of individuals who comment or contribute throughout the innovation evaluation. In Table 1, we specify the percentage of studies that refer to each stakeholder.

The 3 × 3 OUI Stakeholder Matrix

Individual Creators

Definition Drawing on existing OUI research, we define individual creators as independent persons, engaged in developing new ideas, product concepts, and prototypes, who operate outside the direct control of a firm's NPD function. From our synthesis, we find that individual creators are the most common examples cited in both the practitioner press and popular media, referred to by various terms, such as lead users or user innovators. Individual creators are the focus in 64.6% of all the studies in our data set. Of studies that focus specifically on creators, individual creators appear central in 73.0% of them. Then of all papers that focus on individuals, the creator role is studied in 82.6% of them.

Core Research Trends Individual creators primarily engage in creating brand new products or modifying existing ones in unique ways, to meet their own or other customers' specific requirements (Rindfleisch et al. 2017; von Hippel and Cann 2021). Our synthesis reveals that individual creators thus drive innovation through various creative activities. For example, individual creators might develop their own open source software solutions (Mallapragada et al. 2012), submit original new product designs to firm-sponsored crowdsourcing initiatives (Bayus

2013, O'Hern et al. 2022), or create and share original software modifications (i.e., mods) in gaming communities (Smith et al. 2017). Furthermore, individual creators commonly develop new product improvements in myriad industries, ranging from extreme sports to medical devices (Franke and Shah 2003; Lüthje 2003).

Existing literature establishes that these individual creators often have highly developed, innovation-relevant skills (Lilien et al. 2002; Von Hippel 1988) that enable them to produce not only incremental modifications but even substantial breakthroughs in a given field (Lilien et al. 2012). Early studies determined that the breakthrough innovations of these individual creators could account for up to 20% of new sales (Lilien et al. 2012). Inspired by this demonstrated impact of individual creators on innovation, comparisons of a firm's internal innovation efforts with those by individual creators naturally followed (Poetz and Schreier 2012). Such efforts identified some limitations of individual creators, including evidence that individuals who create one successful product are less likely to repeat their success in the future (Bayus, 2013).

Although empirical evidence thus suggests that individual creators can enhance NPD-relevant outcomes, the positive effects typically appear most pronounced when they entail new technologies or radical innovations (Chatterji and Fabrizio 2014). Some evidence also suggests that though creators outside the firm may generate more novel or creative solutions than firm employees, these innovations are more difficult for firms to commercialize, which limits their impact on revenues and profits (Piezunka and Dahlander 2015; Huang et al. 2014).

Emerging Topics To date, the lion's share of papers focus on evaluating the creativity, product launch, or commercial success of a product developed by an individual creator (e.g., original t-shirt design, novel idea for a laptop computer; Bayus 2013; Fuchs and Schreier 2011). One insight that has received less attention though is how firms might mine emerging forms of

individual creator output (e.g., 3D printable design files posted on Thingiverse.com) to spur innovation and also identify latent consumer needs (Rindfleisch et al. 2017). Recent research has also explored how factors like knowledge distance impact individual creators' willingness to participate in an OUI initiative (Pollok et al., 2019). Individual creators also appear motivated by various factors, including a desire to satisfy their own needs (Baldwin et al. 2006, von Hippel 2006), develop career-relevant skills (Franke et al. 2014), or enhance their in-group status (Lakhani and Wolf 2005). But we find little research that compares different motivations to assess which has the greatest impact on individual creators' success in creating commercializable new products, the value of the products they generate, or their longevity in an OUI initiative.

Firm Creators

Definition Firm creators are organizations that initiate and function as the primary drivers of innovation, by openly sharing knowledge outside the firm and actively engaging external individuals, firms, or groups in the process. The emergence of OUI has given rise to new models of innovation, where firms act as creators that leverage the input of outside partners to optimize outcomes. Creator firm stakeholders appear in 41.6% of the total papers we collected; among papers focused on creators, the firm is the unit of analysis in 47.0% of them; and of all papers focused on firms, the creator role is examined in 58.1% of them.

Broad Research Trends Most research on firm creators investigates situations in which the focal firm opts to share certain intellectual property (IP) resources with external stakeholders, in an attempt to spark innovation and draw attention to its market offerings. Such research generally begins with the premise that firms have inherent advantages over individuals as drivers of innovation, such as greater resources and a full-time, professional workforce. These assets enable firms to drive innovation (Baldwin and von Hippel 2011). Extant research also suggests that

when firms open their IP to outsiders, they must actively leverage the resources and manage the initiatives; the challenge to maintain their culture and guiding philosophy extends across all partners in such efforts (Hidalgo and D'Alvano 2014).

In addition to the beneficial outcomes of open IP approaches, another challenge involves ensuring that the innovation processes is opened to the right participants (e.g., other firm creators, individual creators; Almirall and Casadesus-Masanell 2010; Casadesus-Masanell and Llanes 2011, Lilien et al. 2002). Considering relationships between firm creators and partners, our analysis indicates some strides in understanding certain issues, such as timing of open innovation initiatives (Fang et al. 2015), knowledge transfer within networks (Machikita et al. 2016), and new perspectives on corporate–university innovation partnerships (Perkmann and Schildt 2015). Firms also can discover difficult-to-realize but innovative combinations of product features when they fully open their NPD process to external firm creators (Germonprez et al. 2017). But becoming a firm creator carries an inherent risk, related to finding appropriate partner(s), and extant research has not explored this issue deeply.

Another research stream pertains to how individuals might supplement the innovation efforts of firm creators. Firms can enhance their ideas by inviting individuals and groups to complement and validate their internally generated concepts (Allen et al. 2018), which can produce a potent combination of diverse expertise and firm resources and experience. In their influential *JAMS* article, Cui and Wu (2016) identify synergistic effects in firm–customer innovation efforts, such that customer involvement supplements the firm's technological capability to produce superior product outcomes. In our synthesis, we find that these supplemental activities extend to other efforts, such as idea judging, prototype feedback, and beta testing.

Emerging Topics The relevance of diversity (ethnographic, geographic, ideological) for firm creator efforts is evident in research focused on mobile financial services that reveals that 85% of innovations originate in developing countries (Van der Boor et al. 2014), mostly created independently by users or producers. This finding underscores the importance of grassroots innovation in certain industries. The firm creator model thus should highlight how individual users can expand firm thinking about innovation concepts. For example, developing markets can evoke need-based creativity that may not be easily tapped in developed markets. Finally, the assumption that innovation only comes from young contributors (cf. the less sampled, growing senior population) may be a fallacy that demands exploration in relation to diversity topics.

Group Creator

Definition In contrast with individual and firm creators, group creators refer to self-organizing teams, operating outside the direct control of a firm's NPD function or department, engaged in developing new ideas, product concepts, and prototypes. Group creators receive attention in 17.2% of our collected studies, the smallest percentage of all creator stakeholders. Open source development (Ho and Rai 2017; Spaeth et al. 2015), organization-sponsored innovation challenges (e.g., Space-X, NASA), and hackathons (e.g. MHacks, HackMIT) constitute examples in which group creators come together to develop solutions to complex problems (Boudreau and Lakhani 2015; Dahlander and Piezunka 2014). Of all papers focused on creators, groups are the unit of analysis in 24.2% of them, and of all papers focused on groups, the creator role is examined in 65.0% of them.

Broad Research Trends Significant research applies a knowledge-sharing perspective to understand the relationship between the social network of group creators and NPD performance (Mallapragada et al. 2012; Ransbotham et al. 2012). These studies primarily pertain to open

source development. According to our synthesis, group creators' social network position has important and significant effects on the team's ability to acquire novel knowledge resources and on market responses to the products it produces (Grewal et al. 2006; Oh and Jeon 2007).

Other papers examine various influences of the team composition on group creators' success. Teams with greater internal cohesion generate more successful innovation efforts (Singh et al. 2011). Moderate levels of functional diversity within a group can lead to greater new product creativity, particularly when project uncertainty is high (Dayan et al. 2017). These studies of group composition and mindsets, as internal team resources, complement network-based research that links group creator performance to an ability to acquire novel knowledge from external sources.

Emerging Topics A limited but growing set of studies has established that group creator activity can spur innovation outside established open source contexts. For example, the crowdsourcing platform Wazoku (which acquired the crowdsourcing pioneer Innocentive in 2020) encourages companies to post highly complex, technical challenges that require teams of highly qualified contributors to solve (Card 2014). Other platforms, like IdeaConnection[7], offer a glimpse into the potential future of group creator problem-solving: Rather than relying on self-organizing teams, it relies on advanced AI to form teams of experts. In turn, it boasts an 80% solve rate for the highly complex problems that its corporate clients post on the platform. This alternative approach to group creator team composition represents a substantial departure from self-selection–based models and promises an interesting focus for the future.

Individual Contributors

[7] https://www.ideaconnection.com

Definition Creators attract significant research attention; other roles for stakeholders in innovation processes have been less studied. One of the most interesting stakeholder roles is that of the individual contributor, which we define as an individual stakeholder who shares NPD-focused input that enhances creators' innovation efforts or improves the effectiveness of firms' OUI initiatives. Individual contributors appear in 24.3% of the examined publications. Of papers that focus on contributors, the individual represents the unit of analysis for 44.0%, and of all papers focused on individuals, the contributor role is the focus in 31.1% of them.

Broad Research Trends One stream of research examines how engagement with OUI could affect contributors' attitudes toward the creators, products, and firms they support with contribution activities. For example, Fuchs et al. (2010, 2013) and Dahl et al. (2015) provide evidence that individuals who vote on creators' new product submissions on a firm-sponsored crowdsourcing platform exhibit higher liking, willingness to pay, and word of mouth for the firm's products, compared with individuals who passively consume such products. Similar positive associations have been linked to post-purchase product consumption (Smith et al. 2017). A related stream of research investigates how individuals' contribution activity affects their performance as creators; the knowledge that individuals glean from acting as contributors can enhance their ability to produce commercially viable new products (Bayus 2013; O'Hern at al. 2022).

Our synthesis also uncovers research that seeks to identify the motivations of individual contributors. Some indicators are trait-based; individual contributors have been described as owning less advanced NPD-relevant skills than creators and responding positively to recognition from the firm (Jeppesen and Frederiksen 2006). Other work into the motivations of individual

contributors establishes that individual contributors respond to both intrinsic and extrinsic motivations, which can ebb and flow over time (Alam and Campbell 2017).

Emerging Topics One of the most fundamental ways that individual contributors add value in the OUI process is by helping firms select promising creator-generated submissions (Allen et al. 2018, Chang and Taylor 2016). Cui and Wu (2016) offer interesting insights into contingencies that determine how firms should leverage the input of individual contributors in various situations, which also highlight the multifaceted value of these relationships. Considering the evolving competitive landscape (e.g., formerly heralded platforms like Quirky, My Starbucks Idea, and Dell IdeaStorm have gone defunct), contributor motivations and the efficacy of these platforms need to be probed and clarified better.

Firm Contributors

Definition Prior scholarship acknowledges various ways that firms can assume a contributor role, as detailed in 32.1% of our sample. As noted, the contributor role is characterized by a focus on assisting, facilitating, and supporting innovation work undertaken by creators. We define firm contributors as firms that actively implement policies and procedures that stimulate and support the work of creators operating outside their direct control. Of all papers that focus on contributors, we find the firm examined in 58.2% of them. Of all the papers that focus on firms, the contributor role is examined in 44.8% of them.

Broad Research Trends A critical way for firms to function in the contributor role is by offering creators relevant resources that make it easier for them to innovate effectively. Substantial OUI literature explores how toolkits provided to external creators might enable them to develop customized products that better satisfy their needs (Teichmann et al. 2016; Ye and Kankanhalli 2018). In an interesting application, the consulting firm Biomimicry 3.8 offers a creative card

deck toolkit, designed to stimulate innovative use of biomimicry in packaging solutions. For example, the cell shape of a barrel cactus could be an inspiration for a solution for packaging that requires expansion and contraction capabilities. In this way, Biomimicry 3.8 functions as a firm contributor that facilitates and stimulates clients' innovation efforts.

Adopting a toolkit approach also explicitly requires a contributor mindset. The sponsoring firm must deeply understand the needs of creators to be able to develop tools, policies, and procedures that effectively attract creators and enhance their ability to create new products. They also must carefully configure and present those OUI toolkits to creator stakeholders, by strategically defining the breadth of options available and the user-friendliness of the tools (Kankanhalli et al. 2015; Ye and Kankanhalli 2018; von Hippel and Katz 2002).

More broadly though, powerful toolkits are not sufficient to increase the chances of successful firm innovation efforts. Ensuring an enjoyable, hedonic experience for creators is critical to success in online and app-based OUI toolkits (Kohler et al. 2011). Likewise, firms that seek to be effective contributors should actively offer positive feedback and public recognition to the most innovative creators, to sustain their motivation and participation (Jeppesen and Frederiksen 2006). Further research into how other firm contributor activities might enhance innovation outcomes is sorely needed.

Emerging Topics Praise and public recognition are classic mechanisms by which a firm can support and motivate creators, but more research is needed into how monetary or nonmonetary incentives and compensation schemes might determine the number of creators who participate in a crowdsourcing initiative (Boudreau et al. 2011; Poetz and Schreier 2012). Firms operating in the contributor role also might spur participation by selectively sharing certain relevant information. For example, more clearly identifying the sponsoring firm in the problem statement

or request for proposal might increase creators' willingness to participate in highly technical crowdsourcing challenges (Pollok et al. 2019). Firms should carefully consider the various ways they choose to support creators, as well as ways to communicate outside their existing crowdsourcing programs to attract other, highly motivated creators and contributors.

Group Contributors

Definition A group contributor is a collection of individuals who comment on, vote on, rate, or otherwise evaluate the creative endeavors of other creators. These groups have a supporting role, in that they influence the participation and performance of creators. Group contributors have been studied relatively infrequently, appearing in just 14.4% of papers in our sample. Of these papers focused on contributors, the group is the unit of analysis in 26.1%, and of the papers dealing with groups, the contributor role is the focus in 43.8%.

Broad Research Trends Our synthesis finds that literature on group contributors focuses predominantly on learning how the size and network structure of a contributor group might affect its performance. The findings are mixed; the size of the group that participates in developing an OUI product may enhance (Aaltonen and Seiler 2016) or have no effect (Kane and Ransbotham 2016) on future innovation activity. However, our synthesis finds that group contributors can generate value in the OUI process (Schemmann et al. 2016) by helping firms identify the most valuable creator-generated ideas.

Beyond group size, the characteristics and behaviors of contributor groups can have differential effects. Greater cohesion among the group of contributors has a positive influence, by increasing social capital (Singh et al. 2011). Greater cohesion emerges more readily in groups that are free of external influences and in which random connectivity is more likely (Oh and Jeon 2007). But asymmetries in knowledge concentration within a group also can be beneficial in

driving work forward, particularly for open source software (Kuk 2006). Moreover, emergent roles that naturally develop within a contributor group can lead to remarkably stable work structures (Arazy et al. 2016). Finally, existing research supports the idea that contributor groups play a seminal role in enhancing innovation by providing essential feedback to creators. For instance, Mallapragada et al. (2012) find that the number of bug reports that a contributor group provides to developers reduces time to market for open source products. Although research has identified some factors that affect the influence of group contributors, many factors remain unstudied or unknown.

Emerging Topics The motivations underlying group contributors and the impact of group activities represent common considerations; Fuller et al. (2007) find evidence of the intrinsic motivation driving a community of basketball shoe enthusiasts, even when they do not desire functional innovations. Firm recognition of group contributors' OUI efforts also can boost motivation, even more than recognition from peers (Jeppesen and Frederiksen 2006). Experience with group contributor editing on Wikipedia spurs more helpful editing in the future (Aaltonen and Seiler 2016) and can produce more moderated perspectives in the articles (Greenstein and Zhu 2016). Finally, the breadth of group contributor activity is evident in the citizen science space, where groups contribute computing resources (e.g., unused processing power), instead of innovations or ideas, to advance scientific projects (Franzoni and Sauermann 2014).

Individual Customers

Definition We define individual customers as individual buyers of innovations, without having functioned as creators of new innovations or participants who provide feedback on others' original ideas, concepts, and prototypes. Substantial OUI research recognizes that customers *can* make important contributions, but only a small fraction of customers actively becomes involved

in innovation processes (Grewal et al. 2006; O'Hern et al. 2022; Smith et al. 2017). In other words, individual customers mainly take a consumptive stakeholder role, rather than a generative or faciliatory one. A focus on individual customers occurs in 16.1% of our collected works; of papers focused on customers, the individual is the unit of analysis in 51.3% of them; and of papers focused on individuals, the customer role appears in 17.7%.

Broad Research Trends As recognition of individual customers as an important stakeholder group has grown, studies investigating how customers respond to user-developed products in the marketplace have increased too. Customers prefer user-developed products in certain cases (Dahl et al. 2015), and this positive disposition increases their purchase intentions, willingness to pay, and willingness to recommend (Schreier et al. 2012). Customer-generated products also can garner up to 20% higher sales, compared with firm-generated products (Nishikawa et al. 2017). These effects do not hold across all industries though. For example, lead user–generated creations in luxury fashion do not create the same positive sentiments for customers as in other domains (Fuchs et al. 2013), seemingly because customers do not believe that individuals outside fashion houses have the competencies to create products that signal high status.

Emerging Topics The tendency in OUI literature to regard non-creator/non-contributor customers as passive consumers has left a gap in extant literature. Little research pursues insights into how customers might affect other OUI stakeholders, such as through their purchases or word-of-mouth behavior. The sizeable marketing research that focuses on customer lifetime value and electronic word of mouth in non-OUI contexts provides important clues about how customers' non-creator and non-contributor activities still generate substantial value for firms and fellow customers by influencing customer preferences and enhancing new product adoption

(Godes and Mayzlin 2009; Rust et al. 2004; Venkatasan and Kumar 2004). Yet such relevant non-creator, non-contributor customer activity has gone largely unstudied in OUI literature.

Firm Customers

Definition In OUI processes, firm customers are companies that use a product generated by a creator, without modifying or providing feedback about it. Firm customers often take the form of companies that adopt open source products. For example, a web developer might build a website using the WordPress platform and apply various user-generated WordPress plugins, without writing any software code to change these products. Investigations in OUI literature into such firms and their role in the consumption process have been minimal: Firm customers receive attention in just 15.2% of our collected papers; of studies involving customers, the firm is the unit of analysis in 48.7%; and of studies of firms, the customer role is examined in 21.3% of them.

Broad Research Trends Existing OUI literature mainly regards individuals as customers, even though firms also clearly play customer roles. Open source literature offers some insights, by positing that firms are attracted to open source products because they can access them at a reasonable cost, leverage a wide range of customization options, and be reasonably certain that other individuals and firms will create (and share) improvements with other stakeholders (West and Gallagher 2006; Germonprez et al. 2017; Ho and Rai 2017).

Relatively little is known about the factors that drive firms to adopt OUI products rather than firm-generated products. More research is needed to understand what predicts firms' preference for OUI creations, beyond their ability to customize the product. Whether this stakeholder relationship is similar or divergent from that between creators and individual customers remains to be seen. Furthermore, evidence exists that firms that more openly share

their IP with individuals and firm creators can benefit from greater product adoption (von Hippel and von Krogh2003), yet we know virtually nothing about how firm customers can influence other firms' actions, through their word-of-mouth behavior.

Emerging Topics In most cases, firms that choose to engage with OUI function first as customers; they later assume a contributor or a creator role and customize solutions to satisfy their needs. Yet innovation literature still offers very limited insights into how firms transition from customers to contributors or creators, as well as how this transition might affect their adoption of OUI products. Although research on individual responses to OUI products suggests that the allure of these products lies in their ability to spark customers' enhanced identification with the sponsoring firm and creators (Dahl et al. 2015), the factors that prompt firms to adopt such products likely are quite different and have not been explored.

Group Customers

Definition Finally, group customers are collectives that purchase or use OUI output. Growing research into how individuals and firms react to OUI product offerings as customers does not extend to empirical efforts to explore how customers' membership in a particular (e.g., online) group might influence their purchase and usage decisions (only 4.1% of our collected sample). Our conceptualization of groups is closely related to other types of groups identified in marketing literature, such as online support communities (Mathwick et al. 2008) or brand communities (Fournier 1998), but it differs in that our inquiry centers on customer groups associated with an OUI initiative. Of all papers focused on customers, the group is the unit of analysis in 13.2%, and of all papers that focused on groups, the customer role is key in 12.5%.

***Broad Research Trends*.** Because innovation scholars naturally have gravitated toward examining the roles of creators and contributors in fostering innovation, prior research has

tended to ignore communities that select OUI offerings to consume, without assuming creator or contributor roles. Most visible activity on OUI community platforms is conducted by creators and contributors, yet anecdotal and empirical evidence suggests that most customers simply consume the content available, without actively participating in the OUI process.

Sizeable literature on brand communities offers a perspective that could inform research on the OUI process. Such literature documents that individuals often gather together and interact online to discuss the meaning of the focal brand in their lives and the enjoyment they receive from using and consuming products produced by that brand (Muniz and O'Guinn 2001; Schau et al. 2009). Yet we draw a careful and sharp distinction between this type of consumption-focused engagement by customers (which entails expressing love or admiration for the focal brand and enjoying social interactions with fellow community members) and the contributor activity we describe in the previous section, which is squarely devoted to fostering innovation and helping creators enhance their new product improvement efforts.

Although prior OUI research largely ignores a non-innovation focus, as irrelevant to the innovation process, we contest this assumption. For example, prior research cautions that many user-generated products suffer from a lack of diffusion that limits customer adoption and threatens commercial viability (Svensson and Hartmann 2018). Actively encouraging consumption-focused interaction among groups of customers who already are deeply attached to a given OUI initiative might enhance exposure to said initiative and allow it to reach new customers more effectively. In addition, when more external consumers choose to join and actively engage in a customer group, their consumption-focused conversations may serve to signal a deep underlying interest in the OUI initiative and attract not just new customers but also new contributors and creators.

Emerging Topics Although currently understudied, customer groups may be vital in converting existing customers into contributors or creators, as well as increasing engagement among existing contributors and creators. Consumption-focused conversations in OUI customer groups could generate increased engagement and expressions of love, satisfaction, or admiration for an OUI product. These signals from customer groups also may spur some customers to become contributors or creators and spur existing contributors and creators to devote more time and attention to their innovation efforts.

Stakeholder Theory: Connecting Past Research to Future Research

Stakeholder theory provides a strong framework for linking prior OUI research with forthcoming explorations. In this section, we therefore highlight opportunities grounded in past research to expand understanding of the important interactions among stakeholder groups. We frame this discussion according to pertinent research questions that we derive from a stakeholder perspective on OUI.

To What Extent Do Stakeholders Transition into Other Roles, and Can Firms Leverage These Transitions to Generate Value?

Most OUI literature prioritizes one specific role of a particular stakeholder in the innovation process, often with the implicit, simplifying assumption that a stakeholder fulfills a single role and remains in that role throughout their engagement. For example, on an OUI platform, creators seemingly continue generating new product ideas, designs, and prototypes throughout their entire engagement. Thus, the possibility of stakeholder role transitions has been almost completely ignored. But such a static approach fails to acknowledge that transitions to other stakeholder roles are a natural part of OUI processes. We need research into the degree to

which these transitions occur, drivers or motivations that underlie them, and their impact on value creation.

For example, it is widely acknowledged that firms must attract a critical mass of creators and contributors to their OUI programs, yet we find few insights into how to encourage customers to transition into these stakeholder roles. Furthermore, whether a firm can generate more value by recruiting new creators and contributors from outside its crowdsourcing programs or else by encouraging existing customers to transition into new roles remains an open question. Additional efforts should seek to identify when and how creators or contributors become customers or even transition entirely out of an OUI program. In these cases, a marketing-focused approach could shed light on effective communication and motivations for various stakeholders.

To What Extent Do Stakeholders Take on Multiple Roles in the OUI Process, and Can Firms Harness Multiple-Role Stakeholders to Generate Value?

Although both OUI and stakeholder theory literature acknowledge the potential for multiple stakeholder roles, empirical research generally treats each OUI participant as distinct, occupying a single stakeholder role (Bayus 2013, Fuchs et al. 2010, Nishikawa et al. 2017). When firms or groups implement systems to increase engagement, they have different effects on stakeholders, depending on their roles, so for example, if an engagement system prioritizes creator behaviors over contributor behaviors, the system may impose detrimental effects on stakeholders who take on multiple roles.

Some literature explores how creators who also function as contributors might enhance their abilities to generate successful new product innovations. These creators might contribute activities (e.g., voting on their peers' original ideas) while also creating (e.g., submitting their own new ideas), such that their contribution activity might provide a gateway to their creation

activity (Smith et al. 2017). These inquiries offer some equivocal results. Whereas Bayus (2013) finds, for some contributors, a positive association between individual commenting activity and the likelihood of creating a marketable new product concept, O'Hern et al. (2021) show that commenting, as a type of contribution, increases the ability to develop a marketable new product, but voting does not. Research might extend such inquiries by providing additional evidence about the types of contributor activities that enhance creator performance and the contexts in which assuming a multiple stakeholder role generates the greatest value.

Another multiple stakeholder role that has received insufficient attention is the contributor–customer role. Contributors in an OUI program can provide significant value, but do highly active contributors also effectively promote new product diffusion, by acting as influencers and generating excitement through their word-of-mouth activity outside the program? A similar question applies to a dual creator–customer role.

Do Stakeholders Have Different Impacts on Marketing Outcomes (e.g., Revenue, Profit, Brand Perception, Word of Mouth) Versus Innovation Outcomes?

Prior research has understandably prioritized innovation-related outcomes of broader OUI efforts, such as the volume of submitted ideas, number of product downloads, number of OUI-generated products introduced to the market, or managers' assessments of product innovativeness (Bayus 2013; Mallapragada et al. 2012; O'Hern et al. 2022). But this focus arguably should extend to marketing-related outcomes such as revenue, usage, brand attitude, word of mouth, and other attitudinal measures. Companies that are open and receptive to user-generated ideas likely enjoy positive marketing outcomes from their OUI efforts. In particular, the relationship between individual creators and firm creators generates positive outcomes, based on the attitudinal values and purchase behaviors of consumers. Benefits resulting when firms

promote their collaboration with individual creators include increased purchase preferences, willingness to pay, and perceived innovation ability (Schreier et al. 2012). Yet in some contexts (e.g., luxury fashion), user-designed products backfire (Fuchs et al. 2013). When and why firms should tout their inclusion of individual creators in product design needs to be explored explicitly across industries and domains.

The interactions between individual creators and individual customers also can shape marketing-related outcomes. Chiefly, the perceptions that individual customers have of individual creators affect customers' behavioral intentions. When end-user individual customers interact with developers who have accrued more social capital in open source software projects, the time before the product release decreases (Mallapragada et al. 2012). An individual customer's views of whether the individual creator has the ability or knowledge to design effective products also should determine their attitudes. Some interesting, counterintuitive findings emerge from Schreier et al. (2012), who identify a positive boost of user-designed products on outcomes like willingness to pay and preference, even when the individual creators did not appear to have necessary creative expertise. Yet, as we have noted, a contrary logic applies to user-designed luxury products (Fuchs et al. 20132). Continued research should map how attitudes about an individual creator's competence and expertise translate into marketing-relevant outcomes.

The user-generated, crowdsourced nature of most OUI products can make it difficult to identify the precise market value impact of OUI activities. Therefore, further research should explore how OUI activity, products, and stakeholders distinctly affect specific outcomes, such as profit, revenue, brand value, loyalty, and other aspects tied to the profit chain.

Can OUI Literature Benefit by Reexamining the Intersection of OUI Programs and Customers?

The role of customers as drivers of value is well-established in traditional marketing research. However, because OUI literature focuses much of its attention on factors that enhance creators' ability to generate innovative new products—underpinned by a general sense that users of OUI products do not participate in innovation and only passively consume the products—it often ignores the critical role of the customer. That is, the vital role of customers in driving value (beyond buying and consuming OUI-generated products) has largely been ignored, though a few studies identify elements of creator innovations that appeal to customers, such as novelty (von Hippel 2005), affordability (Chesbrough et al. 2006), personalization (Tidd and Bessant 2009), customer empowerment (Fuchs and Schreier 2011), and community (von Hippel 2005). In an investigation on how direct participation in OUI initiatives influence perceptions of OUI-generated products, Franke and Piller (2004) learn that creators are willing to pay twice as much to purchase their own self-designed products, compared with the best-selling version that offers the same technical quality. Relatedly, individuals who participate in helping firms create and select new product offerings show higher demand for those products due to a higher sense of customer empowerment and the enhanced enjoyment they experience in their OUI activities (Franke et al. 2010, Fuchs et al. 2010).

To understand how customers contribute to innovation, further research might incorporate traditional customer marketing metrics, such as satisfaction, loyalty, and retention (Anderson et al. 1994). Understanding the motivations that drive customers to participate in OUI activities, that is, *why* they participate, can enhance our understanding of *how* they engage. By

reconciling these perspectives, researchers could pave the way for more holistic innovation strategies that harness both user-driven and traditional customer-centric approaches.

We also note another important gap related to applying traditional customer behavior, preferences, and communication strategies to creator innovations. Continued research should explore how these customer-centric concepts can be integrated into OUI frameworks and thereby provide a more comprehensive view of how customer insights can inform and enhance innovation processes. Investigating ways to leverage customer communication and feedback channels within OUI ecosystems also might lead to more effective collaborations of customers and creators that ultimately foster innovation success. Finally, research in OUI should seek a deeper understanding of how customers interact with contributors on OUI platforms. Building on existing insights into the impact of creators on customer preferences, this new avenue of research could help clarify the ever-changing dynamics of OUI ecosystems. Contributors are assuming increasingly significant roles in terms of shaping customer behavior and content consumption patterns; comprehending and predicting this shift is paramount.

To What Extent Can Practitioners Enhance the Effectiveness of OUI Initiatives by Adopting More Fine-Grained Reviews of Creators' Submissions?

Some of the most prominent forms of OUI, such as open source and crowdsourcing, are characterized by large numbers of creators who share their creative ideas, designs, and prototypes, yet only a small subset of these submissions ever get implemented. Perhaps organizations might unlock more value from the vast number of "unsuccessful" submissions by adopting a more atomized selection approach that considers specific elements of each concept, rather than an "all-or-nothing" evaluation. The well-known crowdsourcing platform Threadless regularly receives thousands of design submissions but releases only 5–7 new products per week

(O'Hern et al. 2022). Might it benefit by identifying specific, successful features or trends that informed the selection of the successful concepts, and thereby motivate the development of other, novel designs?

Not surprisingly, extant research has suggested some ways for companies to comb through the large body of submissions more efficiently to identify the most promising ones (Bayus 2013; Bell et al. 2023,). But existing literature still tends to depict the selection process as binary: The vast majority of creator submissions are rejected and viewed as valueless, whereas an exceedingly small number gets accepted and developed in the innovation process. The hurdles that creators face thus are substantial. For example, on the LEGO Ideas crowdsourcing platform, the company formally evaluates only submissions that receive more than 10,000 votes from community members. Any submission can be rejected for various reasons, including similarity to existing products, production cost considerations, projected price points, and licensing rights (Dahlander et al. 2023).

Extending this logic, firms might "recycle" rejected submissions and pinpoint specific elements (e.g., particular line of code, innovative combinations of different LEGO bricks), which then might provide relevant new perspectives and inspiration to creators. We call for research into creators' submissions that regards them not as readymade solutions for generating new products but rather as combinations of atomized, inspirational input that might serve as raw material to fuel developers' creativity by exposing them to an extremely varied, constantly changing set of creative inputs.

Relatedly, this perspective implies the possibility of substantial value available from not just the submissions of the most talented creators but from a broader mass of creators, whose overall submissions may lack sophistication or polish yet contain at least one creative/technical

element that is innovative or inspirational. With regard to frontline stakeholder interactions, firms may need to modify their "all-or-nothing" OUI approaches and find new ways to enhance communications between themselves and creators. On the other side of this interaction, creators often do not fully understand the metrics that a firm uses to evaluate their submissions or the types of solutions that it favors. If firms adopt a more atomized approach to OUI, identify exemplary aspects of the creator submissions they receive, and regularly communicate these insights to the larger creator community, they may be better able to mitigate information asymmetry and enhance the quality of creator submissions they receive.

What Impacts Will Generative AI and Other Technologies Have on How Firms Organize and Manage Their OUI Programs?

This question is particularly interesting, because of AI's potential to both radically transform existing OUI practices and expand the interactions that key stakeholders have with one another. Many forms of OUI, such as ideation contests, open source, and crowdsourcing, imagine the innovation process like looking for the proverbial needle in a haystack, requiring firms to comb through innumerable inapplicable ideas to identify a few successful notions that can generate value for the firm (Bayus 2013; Dahlander et al. 2023). But AI might function to analyze the content that underlies creators' submissions and enhance the effectiveness of idea-screening processes (Bell et al. 2023), which promises substantial impacts on NPD processes overall. Additional research on this topic could help firms address what is likely their most difficult OUI challenge: selecting creator-generated submissions that have the greatest potential to enhance innovation.

To leverage AI and actually improve the performance of OUI programs though, we need research that moves beyond an exclusive focus on creators and explores various ways that AI can

analyze content generated by contributors and customers. For example, many crowdsourcing programs rely on input from contributors (e.g., total votes, overall ratings, total comments) to select creator submissions (O'Hern et al. 2022). But rather than count data (or coarse sentiment analyses), AI tools could analyze contributors' comments precisely, to identify other markers that can effectively predict whether a particular submission is likely to be successful. In this scenario, firms need to change the way they interact with contributors and encourage them to share specific kinds of insights in submitting their comments. Perhaps tailored prompts for contributors would yield qualitatively different comments for AI tools to analyze and draw NPD-relevant inferences.

Similarly, rather than identifying a creator-generated idea to develop, AI tools applied earlier in the NPD process might help firms uncover latent customer needs. Contributors' comments about creators' submissions could be leveraged not just to gauge submission quality but also to uncover unmet customer needs. Continued OUI research should explore how such AI tools can analyze different types of stakeholder activity too (e.g., contributor comments in the course of a crowdsourcing initiative vs. customer communications in brand communities), to discern which types of stakeholder content are most appropriate for enabling AI tools to uncover unmet customer needs effectively. Such AI tools could be revolutionary, in terms of providing firms with rich information about their customers' needs. If AI feeds firms with relevant information about customer needs, directly derived from customer-to-customer communications within brand communities, the communities would take on new importance, transforming from "playgrounds for loyal customers" to "hothouses for NPD-relevant ideas." Such a customer-centric shift seems likely to fundamentally change the kinds of stakeholder input that innovation

researchers and practitioners value; it also could broaden perspectives, with deeply profound implications for OUI research.

Conclusion

The essence of the innovation process has changed dramatically. What was once exclusively an activity conducted in secrecy and behind high corporate walls has been blown open to new possibilities. Research and practice accordingly have shifted, to address both user and open innovation perspectives. The former centers on individual creators and the constellation of factors that affect their creation activity. But the latter stream of research takes a firm perspective to discern how firms might leverage input from external innovators. This distinction seemingly arises from the natural divide in scholarship: User innovation tends to be studied by consumer or entrepreneurship scholars, whereas open innovation is largely an organizational phenomenon, more often addressed by strategy researchers. Although they sometimes acknowledge the possibility of innovation collaboration across natural boundaries, both these views typically exhibit a tacit worldview that identifies a dominant partner (e.g., creator) who accepts some modest input from other actors (e.g., contributors).

We hope that the insights and reasoning presented herein might prompt the next step in the evolution of innovation research, by breaking down some of these artificial barriers. This study seeks primarily to disrupt entrenched views that imply collaborative innovation takes relatively few forms, each of which is dominated by a single stakeholder (e.g., companies accepting simple "suggestion box" ideas from customers, innovators working through an entire solution in relative isolation). Our perspective is fundamentally novel in two main ways.

First, our multiple stakeholder perspective on OUI expands perspectives on key players in innovation processes. Most past research attention zeroes in on individual creators and firm

contributors, but our broader conceptualization of OUI identifies other important customer groups and stakeholder combinations. This broader perspective should help stimulate OUI research in a multitude of interesting directions. Understanding the connections among stakeholders can illuminate paths to improved innovation outcomes, as well as potentially answer thorny, persistent challenges faced by practitioners and academics alike.

Second, this work is the first to highlight complex interactions across a range of stakeholder groups in innovation processes. Noting some examples of these synergistic relationships in practice, we apply focused attention to this area and hope to encourage further research efforts that advance knowledge of novel configurations. In particular, our findings reveal customers as important players in OUI, yet they have received little research attention.

In summary, open and user innovation, which encompasses a range of rich stakeholder perspectives, has extraordinary potential to help solve some of society's most daunting problems through innovation. Taking a multiple stakeholder perspective may unlock enticing new insights to understand and explicate this domain.

CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

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Figure 1. Graphical Representation of the Literature Search and Screening Process

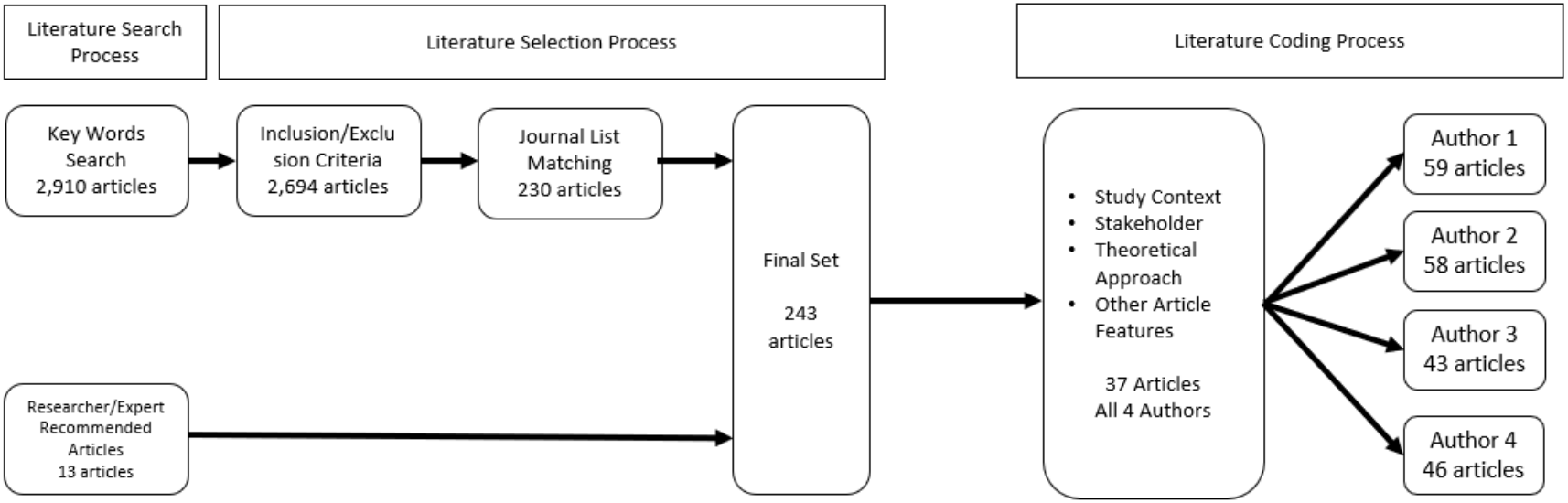

Table 1. OUI Stakeholder Matrix

Percentage of Papers Included in Systematic Review

Stakeholder Unit	Stakeholder Role		
	Creator	**Contributor**	**Customer**
Individual	64.6%	24.3%	16.1%
Firm	41.6%	32.1%	15.2%
Group	21.4%	14.4%	4.1%

Notes: Totals do not sum to 100% because some papers examine more than one stakeholder.

Table 2. Prior OUI Reviews, by Attribute

Review	User Innovation	Open Innovation	Multi-Discipline	Stakeholder Approach	Meta-Analysis or Systematic Review	Theoretical Approach
Frow et al. 2015			X			X
Fuller 2010	X					X
Galvagno et al. 2014			X		X	X
Hoyer et al. 2010	X					X
Ind and Coates 2013			X			
O'Hern et al. 2010	X					
Voorberg et al. 2015	X				X	
West and Bogers 2014		X			X	X
Lee et al. 2012		X				
Gemser & Parks 2017	X	X				
West et al. 2014		X				
Randhawa et al. 2016		X	X		X	X
Chesbrough & Bogers 2014		X	X		X	X
Current work	**X**	**X**	**X**	**X**	**X**	**X**

Table 3. Key Insights and Representative Articles by Stakeholder Role and Unit

Stakeholder Role	Stakeholder Unit	Key Findings	Exemplary Articles
Creator	Individual	• Creation activities have positive consequences for creator and firm. • Dependent measures used to reflect positive creator outcomes are not typically linked to profit or revenue.	Piezunka and Dahlander (2015) Ransbotham and Kane (2011)
	Firm	• Closed vs. open innovation has been an ongoing debate. • In certain conditions, firms can increase profits and consumer surplus by deciding to open their NPD processes to outside individuals and firms. • Firms can discover combinations of product features that would be difficult to realize with a closed innovation approach.	Allen, Chandrasekaran, Basuroy (2018) Baldwin & von Hippel (2011) Cui and Wu (2016) Germonprez et al. (2017)
	Group	• Groups often emerge in highly collaborative co-creation contexts, such as open source development. • Groups' position within a larger network of creators can significantly affect their performance.	Ho and Rai (2017) Ransbotham et al. (2012) Singh et al. (2011) Spaeth et al. (2015)
Contributor	Individual	• A fundamental way that individual contributors add value in the OUI process is by helping firms select the most promising creator-generated submissions. • Individual contributors' engagement with OUI can affect their attitudes toward the creators, products, and firms they support. • Individuals' contribution activity affects their performance as creators; the knowledge that individuals glean from acting as contributors can increase their ability to produce commercially viable new products. • Contributors may have less advanced NPD-relevant skills than creators but still respond positively to recognition from the firm.	Jeppesen & Frederiksen (2006) Alam & Campbell (2017) Allen, Chandrasekaran, Basuroy (2018) Chang and Taylor (2016)
	Firm	• An important way for firms to contribute is by providing creators with resources that make it easier for them to effectively innovate. • Tools may not be enough to generate innovative outcomes; significant attention must be paid to how these tools are configured and presented to creators.	Kankanhalli et al. (2015) Kohler et al. (2011) Luo and Toubia (2015) von Hippel and Katz (2002) Ye and Kankanhalli (2018)

		• The quality of creators' work can be enhanced by providing them with hedonic, enjoyable workflows.	
	Group	• The role of group size and group member characteristics in enhancing innovation outcomes is the focus of much research • Studies have been rather equivocal regarding the influence of group size on innovation outcomes • Intragroup characteristics such as group cohesion, knowledge concentration asymmetry, and the presence of emergent roles have a positive influence on innovation performance • Contributor groups form a distinct yet essential part of open source projects and creators can leverage these groups' inputs to improve a product and reduce time to market.	Aaltonen and Seiler (2016) Arazy et al. (2016) Kane and Ransbotham (2016) Kuk (2006) Mallapragada et al. (2012) Singh et al. (2011)
Customer	Individual	• Individual customers are both recipients of the knowledge that lead users in their networks create and important conduits through which lead user–produced knowledge can ripple through networks. • Firms can instill favorable impressions in customers who never directly engage in the OUI process (e.g., by communicating that other customers were involved in the process).	Song et al. (2020) Schreier et al. (2012) Nishikawa et al. (2017)
	Firm	• Firms can adopt readymade product modifications created by external creators and use them to improve business performance (e.g., MySQL software enhancements).	West and Gallagher (2006) Germonprez et al. (2017) Ho and Rai (2017)
	Group	• Largely unknown; the majority of visible activity in OUI ecosystems involves creators and contributors. • Opportunities for insights here are expansive; this group of stakeholders could be enormous. • Larger market-facing approaches may be the best way to understand these OUI activities.	Svensson and Hartmann (2018) von Krogh et al. (2003) O'Hern et al. (2022)

Web Appendix A: Search Strings by Theme

Theme	Search String
Innovation	(innovat* OR invent* OR "new product" OR "product development" OR "npd" OR modif* OR creativ* OR "idea generat*" OR idea-generat* OR ideat* OR knowledge)
Customer	(customer* OR consumer* OR user* OR partner* OR supplier* OR client* OR entrepreneur* OR community* OR prosumer* OR "lead user*")
Firm	(firm* OR company* OR corporation* OR enterprise* OR organization* OR manager* OR employee* OR team* OR "business unit*" OR sbu* OR division* OR department*)
Shared Value	(co-creat* OR cocreat* OR co-produc* OR coproduc* OR co-design* OR codesign* OR co-develop* OR codevelop* OR co-opt* OR "user innovat*" OR user-innovat* OR "open innovat*" OR open-innovat* OR "open sourc*" OR open-sourc* OR crowdsourc* OR crowd-sourc* OR customiz* OR mass-customiz* OR personliz* OR "peer production")

Web Appendix B: Journals that Meet Inclusion Criteria and Corresponding Number of Articles in the Review

Journal Title	No. of Articles
Academy of Management Journal	3
Academy of Management Review	3
Harvard Business Review	1
Industrial Marketing Management	2
Information Systems Research	12
International Journal of Research in Marketing	2
Journal of Business Research	29
Journal of Consumer Research	1
Journal of Interactive Marketing	5
Journal of Marketing	15
Journal of Marketing Research	7
Journal of Product Innovation Management	24
Journal of the Academy of Marketing Science	8
Management Science	22
Marketing Letters	1
Marketing Science	6
MIS Quarterly	10
Organization Science	9
R&D Management	16
Research Policy	53
Sloan MIT	3
Strategic Management Journal	4
Other	7
Total	243

Web Appendix C: Full Review Data Set References

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