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The Third Design Space: A postcolonial perspective on corporate engagement with open source software communities

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Abstract

Corporations increasingly engage with open source software communities in the co-creation of software. This collaboration between corporate professionals and open source software community members is strikingly different from the early days of software development where for-profit firms attempted to dominate and control the industry while attempting to throttle the success of independent developers offering an alternative, open source option. While many metaphors like trading zones, common pool resources and ecosystems have helped understand the phenomenon, the metaphors do not portray what the industry was like before and after the transition. We adopt a postcolonial metaphor as an analytical lens to examine such collaboration based on qualitative data gathered over three years from executives, managers and developers within corporations that engage in open source software development. Drawing on these insights, we then theorize a "Third Design Space," based on the concept of the third space proposed by Bhabha. This metaphor encourages the cultivation of a new design environment, creation of new design associations and circulation of shared design resources. Together these practices and behaviours make it possible to nurture innovative methods and new rituals for designing software

with results and methods that represent a distinct departure from the competitive and proprietary past, even creating innovative artefacts that could not have been created without the Third Design Space.

KEYWORDS
metaphor, open source software, postcolonialism, software development, Third Design Space, third space

1 | INTRODUCTION

Software development has evolved since Raymond, in 1999, unsettled the field by presenting two metaphors of the open source world, the cathedral and the bazaar. We can therefore no longer rely on Raymond's depiction to explain differences between the top-down, "no beta released before its time" approach common to most commercial software development and the bottom-up, "release early and often" approach to developing open source software. In the past, corporations sold proprietary commercial software by carefully designing products, protecting them, competing externally and rewarding stakeholders, whereas open source software communities designed communal artefacts by sharing early-release software code, inviting participation and enabling collaboration for the common good. These two narratives were regarded as distinct from one another, revealing two cultures with different sets of practices, value systems, vocabularies and customs. Now, it is recognized that software is co-created across groups of participants (Dahlander & Magnusson, 2005; Fitzgerald, 2006; von Hippel & von Krogh, 2003), articulated through metaphors such as trading zones (Kellogg, Orlikowski, & Yates, 2006), common pool resources (Bonaccorsi & Rossi, 2003; Cortesi, 2009) and ecosystems (Anker, 2002; Germonprez, Kendall, & Kendall, 2014; Mars & Bronstein, 2018 and Mars, Bronstein, & Lusch, 2012). While these metaphors have advanced the field by offering alternatives to the classical cathedral and bazaar metaphor, they only provide limited help in explaining the collaborative practices we observed as we engaged in a multi-year empirical study.

In this study, we worked with over 40 organizations, most of which were for-profit corporations that made a conscious effort to devote resources to open source software communities without the transactional arrangements and reciprocity agreements typical for trading zones, common pool resources and ecosystems. The organizations varied from small contractors such as SourceAuditor to multinational firms such as Microsoft, and many were extremely active open source contributors, including IBM, Samsung, Red Hat, Linaro, Hewlett-Packard and Texas Instruments. Our engagements revealed practices more domesticated than the bazaar, but less structured and rule-based than trading zones, common pool resources and ecosystems. We also enumerated the tangible and intangible organizational benefits from devoting resources to engage with open source software development (Kendall, Kendall, & Germonprez, 2016; Kendall & Kendall, 2009a, 2009b).

Building on these insights, the purpose of this research was to identify and develop a metaphor that could explain our observations. Much qualitative, interpretive research is exploratory in which researchers collect data through interviews and then examine the evidence to propose a theory. In doing so, researchers may use Atlas.ti or Leximancer to identify a word cloud or heat map to provide clues on what to explore further. In contrast, we identified an alternative metaphor based on insights from our interviews with software developers who were currently participating in collaborative corporate-communal efforts. Hence, when it came time to analyze the data, we searched for evidence that could help us adapt and elaborate the metaphor as a novel explanation of how corporate-communal collaboration unfolds in open source software development.

Traditionally, the cultures of corporate developers and open source hackers have been very different (Isaacson, 2014) and even antagonistic (Gitcoin, n.d.). So, we needed a metaphor that could capture the behaviour of two

distinct cultures of software developers that were previously incompatible, but now had found the reasons for and the desire to collaborate closely with one another. From earlier work (Kendall & Kendall, 2009a, 2009b), we remembered how powerful the research of Bhabha (1994 and 1996) and his interpreters (Frenkel, 2008; Huddart, 2014) was in making sense of such contexts. Bhabha explains how strongly dominating and loosely organized groups, despite foundational differences in values and asymmetric power relations, can develop shared cultures to produce something of higher value in a postcolonialism context. Such efforts involve what Bhabha calls the "third space," which we adapted to account for the practices we observed in corporate-communal software design.

As a result, we advance the concept of a metaphorical "Third Design Space" to capture how software professionals engage with open source software communities on behalf of their corporations through a complex set of practices. While the fundamental purposes of these practices are corporate gain and community contribution to ensure long-term communal sustainability (Germonprez et al., 2012), such co-creation of software involves knowledge sharing and collaboration in a transformative, contradicted, unpredictable and continually evolving environment. This can be seen in the responsive activities of members (Germonprez, Kendall, Mathiassen, Young, & Warner, 2017), the ongoing management of interdependencies (Lindberg, Berente, Gaskin, & Lyytinen, 2016), and the determination of success (McDonald & Goggins, 2013) in open source software community engagement.

Accordingly, the Third Design Space is not an actual, physical space where participants get together and develop software. Rather, it is a nonfigurative, abstract space which Bhabha refers to as an imaginary place where people can develop new things that were not possible in the other spaces available to them. As such, the Third Design Space offers practitioners and researchers a new intellectual perspective that can help us understand and explain how corporate professionals and community members with perceptually different attitudes toward profit, ownership and branding come together to design new software. We refer to Gurbani, Garvert, and Herbsleb (2010) for examples of different attitudes in corporate open source and community open source members.

In the following, we start by examining the literature on open source software development from communal and corporate perspectives. Next, we share insights into postcolonialism (Bhabha, 1996; Franklin, 2004 and Frenkel, 2008) as an analytical lens for seeing the emergent and collaborative environment of corporate-communal engagements. Using this framing, we then present our empirical analyses and our development of the Third Design Space. In conclusion, we compare the Third Design Space with other metaphors in the open source literature and discuss implications for theory and practice of how corporate professionals engage communities in the co-creation of software.

2 | OPEN SOURCE DEVELOPMENT

Next, we examine the literature on open source development, spanning nearly two decades. We first present community-centric views and corporate-centric views of open source development, followed by collaborative views of corporate-communal engagements.

2.1 | Community-centric open source engagement

Research on open source software communities has traditionally focused on individuals working as a community, mostly independent of corporate involvement. These community-centric studies examine how open source software communities reveal subtleties of sociotechnical change (Tuomi, 2001), including the role of diversity (Daniel, Agarwal, & Stewart, 2012), the materiality of open source software (Howison & Crowston, 2014), the emergence of community governance (Di Tullio & Staples, 2013; O'Mahony & Ferraro, 2007 and Shah, 2006) and the creation of open knowledge (Hemetsberger & Reinhardt, 2004). Open source developers carry internal motivations rooted in communal altruism, as well as external motivations concentrated on expected returns for participating (Hars & Ou, 2001; Kendall et al., 2016). Moreover, community leaders emerge through their ability to make social decisions and technical contributions, and it is imperative that open communities be socially integrated to avoid unraveling from either

"forking" or "Balkanization" into numerous sub-groups (Fleming & Waguespack, 2007). Conflicts stemming from such control issues can hamper or cause failure in collaboration among open source software communities, unaffiliated volunteers and external groups (Jensen & Scacchi, 2005).

The community-centric perspective is also scoped beyond the individual and the open source software community. A critical piece of literature is the private-collective innovation model proposed by von Hippel and von Krogh (2003) that associates open source software development with private investment on the one hand and collective action on the other. Similar to other frameworks by Feller and Fitzgerald (2000); Nelson, Sen, and Subramaniam (2006); Niederman, Davis, Wynn, Greiner, and York (2006a, 2006b); von Krogh, Haefliger, Spaeth, and Wallin (2012); and von Krogh and von Hippel (2006), this model seeks to account for the increasing and explicit role of commercial engagement within communal spaces.

2.2 | Corporate-centric open source engagement

Ljungberg (2000) characterized the corporate open source movement as a "key to understanding of future forms of organizations, information work and business" (p. 208). Here, benefits of corporate participation with open source software communities stem from a leveraging model that provides corporations with the ability to send work customarily handled in-house to an open source software community. Hence, corporations effectively work with an open source software community to reduce internal efforts in software design, debugging and testing. Such a leveraging model also affords extraction of work from a community for internal value creation (Fitzgerald, Kesan, Russo, Shaikh, & Succi, 2011; Mehra & Mookerjee, 2012) and identification of talent for corporate employment (Ågerfalk & Fitzgerald, 2008; Henkel, 2006; Johnson, 2006; Lee & Cole, 2003; Stewart, Ammeter, & Maruping, 2006). In this, corporations treat open source software communities as pools of resources from which artefacts and talent can be drawn for the advancement of internal design practices.

Models propelled by criticism, error correction and knowledge sharing among community members (Lee & Cole, 2003) stand in contrast to firm-based, proprietary and commercial models of software development. Corporate engagements with communities are understood through corporate requirements, the cost of corporate adoption and how working with open source software communities can be aligned with corporate strategy (Shaikh & Cornford, 2010). Such engagements demonstrate "how a firm's ability to access a value network of complementors is crucial for effective value creation and capture," (Morgan, Feller, & Finnegan, 2013, p. 569). The leveraging model emphasizes the criticality of formal and informal means enabling corporate value creation and capture in engagements with open source software communities (West & O'Mahony, 2008).

However, corporate engagement with open source software communities is not merely a resource management issue. Engagement can also aim to stabilize open source software communities, as they become part of corporate strategies (Germonprez et al., 2017; Kelty, 2013). Corporate involvement can help manage risks inherent in open source software communities that stem from license compliance, leadership changes and community longevity (Germonprez et al., 2012). The desire of corporations to have communities become better organized signifies a progression toward open source as professional engagement (Kelty, 2013).

2.3 | Corporate-communal open source engagement

Our work is most squarely positioned within the literature of corporate-communal open source engagement. Early research into corporate-communal open source engagements asked the challenging question of how organizations can consider open source as a viable part of corporate strategy, product innovation and talent recruitment (Feller & Fitzgerald, 2000; Fitzgerald, 2006). In this, open source engagement becomes an extension of corporate work that can be effectively shared with all who have an interest. For example, the questions of why and how Toyota engages with the Automotive Grade Linux open source project are deep and complex, going far beyond simply using the open

source software in automobiles. These questions entail issues of corporate governance, competitive markets and intellectual property (Feller, Fitzgerald, Hissam, & Lakhani, 2005; O'Mahony, 2007).

Corporate-communal studies reveal tensions and imbalances between corporations and communities to illustrate how such engagements improve capacity, expand innovation streams and support strategic thinking across distinct corporate and communal spaces. As such, attitudes and practices have changed as software professionals have joined, fostered and created open source initiatives to advance corporate goals (Dahlander & Magnusson, 2005 and 2008; Feller & Fitzgerald, 2000; Feller et al., 2005; Feller, Finnegan, Fitzgerald, & Hayes, 2008; Fitzgerald, 2006, Fitzgerald et al., 2011; Lee & Cole, 2003). In this new order, open source software communities have become increasingly defined through corporate engagement, and many of them would not exist in their current form without significant corporate involvement.

Corporate-communal engagement in open source is manifest in many ways and has been explored to varying degrees, challenging traditional corporate-based ways of innovating (Rajala, Westerlund, & Möller, 2012; West & Gallagher, 2006). Vujovic and Ulhøi (2008) studied IBM as one of the most famous and successful cases of corporations *evolving business models and relationships* to integrate innovative corporate approaches with open source software communities. A corporate-communal engagement "forces the actors involved to shift focus from the innovation itself to the identification of new supporting services higher up the value chain" (Vujovic & Ulhøi, 2008, p. 142). Further, Dahlander and Magnusson (2008) proposed that corporations evolve their business models through accessing, aligning and assimilating external knowledge available from open source projects. Interestingly, the corporate-communal engagement was found to obscure and even collapse the traditional boundary between design and use as corporate employees working in an open source software community often remained as primary users of the open source product (Kelty, 2008).

Further considering evolving business models, Dahlander and Magnusson (2005) explored how open source software companies formed different types of relationships with their respective communities—parasitic, commensalistic and symbiotic—in which corporations find gains while communities receive value ranging from losses to indifference to improvements. Their research was particularly revealing of the operational concerns that corporations faced in forming these relationships. In a later but related paper, Dahlander and Magnusson (2008) explored how firms can "make use" of open source software communities in relating external knowledge to internal innovation and aligning their strategy with that of a community.

Research on corporate-communal engagements has also been advanced through "opensourcing," considering open source development as part of *global supply chains* (Ågerfalk & Fitzgerald, 2008). Commercial organizations can develop global open source software communities around their software products (Kilamo, Hammouda, Mikkonen, & Aaltonen, 2012), underscoring the shift toward for-profit companies cooperating with each other rather than corporations developing open source software on their own (Feller et al., 2008; West & O'Mahony, 2008). Continued work examined open source software in corporations and their partnerships with open communities to include "open innovation" (Conboy & Morgan, 2010), recasting innovation as "collaboration and knowledge-sharing with other business units, customers, partners, competitors and other relevant stakeholders outside the boundaries of the firm" (p. 9).

Further to global supply chains, efforts have been made to map business ecosystems that have come to include open source projects (Li, 2009), represent open source projects as a global distribution mechanism (Watson, Boudreau, York, Greiner, & Wynn, 2008), and consider how risk is mitigated within globally distributed open source projects (Germonprez, Link, Lumbard, & Goggins, 2018). Through this work, open source projects become understood as one of many vendors in an organization's overall innovation stream. Automotive Grade Linux becomes a customizable commodity technology component for Toyota, much like tires or headlights. While the analogy is not perfect, it highlights the role of open source projects in global supply chains.

Finally, corporate-communal engagements alter the *design of artefacts*. Within these settings, design becomes a collaborative and open process, not always following a linear problem-solution approach. New forms of design are evident in the creation of governance models (Shaikh & Henfridsson, 2017), community structures (West & O'Mahony, 2008) and software (Gurbani et al., 2010; Gurbani, Garvert, & Herbsleb, 2006). Corporate-communal

engagement enables us to reconsider what design means as it is made transparent and actionable for all. In doing so, design becomes an activity that entails the needs of many problems and many solutions for many evolving business models, distributed across a global supply chain.

Further to the design of artefacts, work has provided a perspective to consider external factors that play a role in the design of more localized artefacts (i.e., software, governance and work). Germonprez et al. (2017) suggest that the design of artefacts should be considered in light of competing interests and global distribution that are evident in corporate-communal open source engagements. In this research, we explore the design of artefacts in corporate-communal engagements, specific to how corporate and communal members construct workspaces in these complex settings (Homscheid, Schaarschmidt, & Staab, 2016). Table 1 summarizes the corporate-communal research that informs our work, highlighting key areas of interest with key research contributions.

3 | THE POSTCOLONIAL METAPHOR

Some may take exception to a metaphor in which for-profit companies are pictured as dominant aggressors towards tribes of loosely organized coders that attempt to make a difference with few or no resources. However, researchers have weighed the ill effects as well as any advantages entailed by colonialism (Heldring & Robinson, 2012; Manning, 1974): Colonialists exert excessive control and set up rules that are inequitable, but they also provide infrastructure and transfer technologies to their colonies. We similarly call attention to researchers (Campbell-Kelly, 2001; Levy, 2010 and Raymond, 1999) who describe the behaviour of corporations and open source developers as corresponding to that of colonialists and tribes during the early history of software development.

Pointing out the negative aspects of dominant computer companies, a noted historian of computing observed: "Microsoft's real offenses are its aggressive, arrogant, brattish behaviour and the extreme wealth of its founder" (Campbell-Kelly, 2001, Location No. 6117). As a result, "Microsoft is often perceived as big, ugly and lacking in humanity and in capacity for innovation" (Campbell-Kelly, 2001 Location No. 5235). Raymond (1999) is even more critical of Microsoft describing the release of the infamous Halloween Documents. He notes: "These internal strategy documents recognized the power of the open source model and outlined Microsoft's analysis of how to combat it by corrupting the open protocols on which open source depends and choking off customer choice" (Raymond, 1999,

TABLE 1 Research on corporate-communal open source engagements

Areas of Interest in Corporate-Communal Open Source Engagements	Key Research Contributions
Evolving business models and relationships	• Dahlander and Magnusson (2005) • West and Gallagher (2006) • Vujovic and Ulhøi (2008) • Dahlander and Magnusson (2008) • Kelty (2008) • Rajala et al. (2012)
Global supply chains	• Ågerfalk and Fitzgerald (2008) • Feller et al. (2008) • Watson et al. (2008) • West and O'Mahony (2008) • Li (2009) • Kilamo et al. (2012) • Germonprez et al. (2018)
Design of artefacts	• Gurbani et al. (2006) • West and O'Mahony (2008) • Gurbani et al. (2010) • Homscheid et al. (2016) • Germonprez et al. (2017)

p. 183, Location No. 2795), and goes on to say that "they confirmed a lot of peoples' darkest suspicions about the tactics Microsoft would consider in order to stop it" (Raymond, 1999 p. 184, Location No. 2798). Campbell-Kelly (2001, Location No. 3698) sums up the colonial power-like behaviours of software consolidators as follows: "Consolidators such as Computer Associates and Sterling Software are often portrayed as predators that 'hoover up' ailing firms in order to strip them of their software assets."

Raymond (1999) used the "tribe" metaphor early on: "The idea of open source has been pursued, realized, and cherished over those thirty years by a vigorous tribe of partisans native to the Internet. These are the people who proudly call themselves "hackers"—not as the term is now abused by journalists to mean a computer criminal, but in its true and original sense of an enthusiast, an artist, a tinkerer, a problem solver, an expert" (Raymond, 1999 Location No. 56). Levy (2010) describes the approach tribes took to make an impact without great resources: "It is symbolic of what the Homebrew people were doing—creating a niche in the world of small computer systems, then digging deeper to make the niche a cavern, a permanent settlement" (p. 213).

Hence, while some corporate professionals and open source software community members may not agree that their situation embodied the colonizer or tribe mentality, there is considerable support for this position. We are in a different era now, and we suggest it can be helpfully understood as a *postcolonial world*. Postcolonial engagements "find their voice in a dialectic that does not seek cultural supremacy or sovereignty. They deploy the partial culture from which they emerge to construct visions of community and versions of historic memory that give narrative form to the minority position they occupy; the outside of the inside: the part in the whole" (Bhabha, 1996, pg. 58). Bhabha (1994, 1996) investigated cultural relationships between dominant powers (colonizers) and natives (tribes) and how cultures come to embrace expectations regarding the unfolding of their relationships. As these relationships are in their formative stages, knowledge transfer is never a one-way street. The formation of shared knowledge comes from the asymmetric and power-laden confrontation between the participants, serving to legitimize a relationship amongst those interested (Frenkel, 2008). According to Frenkel (2008), this postcolonial environment "is not entirely governed by the laws of [one member], and it is here that hybrid cultures are constructed that belong to neither of them but that are instead a fusion of the two" (p. 928). The result is a balance of power among the members in which all create and share localized knowledge and practices to support and leverage the partnership (Bhabha, 1994).

Some scholars situate postcolonial criticism "at the intersection" of a variety of disciplines and characterize it as a way of "making articulations across a range of topics and themes" and a "locus of theoretical and political reflection" (Merten & Krämer, 2016, p. 10). Indeed, a postcolonial analysis in IT research has proven useful for many scholars. Prieto-Ñañez (2016) framed it well when he wrote: "A postcolonial history of computing does not neglect the historical centrality of particular spaces or groups. Instead, it may give us a new set of tools to understand the multiple social forces that converge in these locations. It can contribute to the global understanding of the larger systems of material and knowledge production and distribution essential to computing" (p. 3).

A postcolonial environment was also evidenced in the IT-enabled environments between commercial Broadway productions and nonprofit theatres (Kendall & Kendall, 2009a, 2009b). Using an interpretation of Bhabha's (1994, 1996) and Frenkel's (2008) postcolonialism, the authors found six distinct deliverables that IT can successfully address when large commercial productions and small nonprofit theatre companies cooperate to share knowledge and practices for their mutual benefit.

Further, postcolonialism has also explored IT in the developing world (Franklin, 2004; Irani, Vertesi, Dourish, Philip, & Grinter, 2010). The postcolonial discourse was shown to focus on "power, authority, legitimacy, participation and intelligibility in the contexts of cultural encounter" (Irani et al., 2010, p. 1311). The authors demonstrated a reconfiguration of design-oriented cultural encounters, labelling this change in viewpoints as a postcolonial shift that "allows designers to recognize their work not as designing appropriately for static, nationally-bound cultures, but instead as interventions both in conversation with *and* transformative of existing cultural practices" (Irani et al., 2010, p. 1314). In this line of research, postcolonialism was used to describe computing as "a bag of tools that affords us contingent tactics for continual, careful, collective and always spatial inscriptions of cultural-technical situations in which we all find ourselves" (Philip, Irani, & Dourish, 2012, p. 5).

Finally, postcolonialism provided an innovative perspective on IT offshoring (Ravishankar, Pan, & Myers, 2013). In this article, the authors explored the asymmetric power relationships between an Indian software vendor and Western clients. Using the postcolonialism metaphor of Bhabha (1994) and Moje et al. (2004), they revealed an unbalanced relationship between Western corporations and the Indian culture that the corporations were attempting to colonize through software outsourcing. An altered postcolonial environment arose from these interactions. These interchanges could be characterized as evolving sets of "order and orderliness, whilst at the same time elucidating … fundamental precariousness and fragility" amongst members (Ravishankar, Cohen, & El-Sawad, 2010, pg. 15). Table 2 summarizes the research chronologically that helped reveal postcolonialism in IT, computing and media research.

We distinguish our work from those appearing in Table 2 by adopting postcolonialism as a metaphor for co-creating the Third Design Space, rather than as a literal event or as occurring in a specific location. In doing so, we explore the environments created amongst cultures as shared and equalized among contradictory forces, an underrepresented topic from Bhabha (1994, 1996) and Frenkel (2008).

Bhabha (1994) declares the postcolonial environment to be a "third space" that arises in the postcolonial milieu after tribes and colonialists have lived the colonial experience of subjugation and domination. Tribes resist suppression, often in subtle ways, through mimicry of the colonialists, and though a clever twist, changing mimicry to mockery (pp. 85-92). Bhabha describes a third space that arises out of postcolonial interactions (Bhabha, 1994) as philosophical and psychological rather than physical.

The concept of a third space has been taken up enthusiastically in interesting and useful ways by numerous scholars outside of the information systems discipline (Aaen & Dalsgaard, 2016; Brueckner, Spencer, Wise, & Marika, 2016; Chase, 2018; Chulach & Gagnon, 2016; Cohen, 2018; Dudgeon & Fielder, 2006; Fowler, 2007; Furman, 2016;

TABLE 2 IT-related postcolonial research

Authors	Concerns Addressed	Constituted By
Franklin (2004)	Exploration of practice as a way to build, share and localize representations	The role of everyday practice, strategy, tactics and representations in constructing meaning
Kendall and Kendall (2009a,b)	Exploration of IT-related exchanges between nonprofit theatre and commercial Broadway productions	Using cultural exchanges, including IT and Web 2.0, in the third space to improve production capabilities
Irani et al. (2010)	Identification of conditions of practices of knowing and telling	Design work as community engagement, articulation and translation
Ravishankar et al. (2010)	Examination of the mobilization of discursive resources of indigenous firms	Outsourcing services to global clients through postcolonial themes of ambivalence and mimicry
Philip et al. (2012)	Reinterpretation of narratives to encourage discovery and experimentation	Tactics leading to contingent construction of narratives
Ravishankar et al. (2013)	Examination of power and control and the constraint of indigenous firms	Outsourcing services to global clients as a postcolonial theme
Merten and Krämer (2016)	Examination of postcoloniality as a still developing and spreading set of intellectual enterprises	Opposition to symbolic and material manifestations of inequality, oppression and exploitation in media and media access
Prieto-Ñañez (2016)	Explanation of postcolonial analysis and the history of computing	Using postcolonialism as a new set of tools to open global understanding of larger systems essential to computing
Kendall, K., Kendall, J., Germonprez and Mathiassen (2020) (This study)	Analysis of corporate co-creation of software in open source software communities	Introduction of the *Third Design Space* where open communication, coordination and sharing of knowledge are applied in localized and differentiated ways

Gutiérrez, 2008; Heath-Kelly, 2012; Hirji, 2015; Hudson & Mountz, 2016; Krmpotich, 2016; Lam, 2018; Mcintyre & Hobson, 2016; Routledge, 1996; Saha, 2011; Severini, 2010; Tekin, 2017; Themen, 2016; Verbaan & Cox, 2014). They have all found Bhabha's concept of a third space useful in illuminating their specific fields of study ranging from critical human geography studies to jazz music as shown chronologically in Table 3.

In almost every instance, these researchers found Bhabha's third space of Postcolonial theory to be useful in guiding contributions to theory and practice. In study after study, field after field, it allowed researchers and lay people alike the ability to reconceptualize their situations in new ways. Because of their ability to visualize a third space,

TABLE 3 Bhabha's postcolonialism metaphor of the third space as used in other disciplines

Discipline	Main Objective Integrating Bhabha's Third Space	Citation
Critical human geography	To critically engage in negotiating in a third space created by the interactions of empowered academic intellectuals and activists fighting oppression	Routledge (1996)
Community and applied social psychology	To create a third space within tertiary institutions as ways of thinking and doing by Indigenous Australians	Dudgeon and Fielder (2006)
Art	To describe a strategy for self-determination in American Indian Art	Fowler (2007)
Sociocritical literacy	To replace traditional literacy programs with those meant to engender political power in students from nondominant communities	Gutiérrez (2008)
Literary criticism	To examine a play in relation to the third space to determine whether hybridity alone can subvert the racial power structure	Severini (2010)
Music distribution	To recognize how standardized marketing processes marginalized British Asian dance music, limiting its mainstream potential in the third space	Saha (2011)
Criminal justice	To challenge whether policies on counterterrorism have increased security in the third space after 9/11	Heath-Kelly (2012)
Library science	To encourage research data management, which must be shared by both support staff and researchers in the third space	Verbaan and Cox (2014)
Music creation	To show that young musicians' musical production was influenced significantly by their presence in the third space	Hirji (2015)
Russian–American Literature	To better understand literature created by Russian-American writers in the third space	Furman (2016)
Sports	To understand the complexities and nuances ordinarily ignored by gendered discourse performed in English football culture	Themen (2016)
Aboriginal studies	The third space enterprise is presented as an alternative pathway for Indigenous economic participation, one that is without assimilation pressures	Brueckner et al. (2016)
Public humanities research	To understand how public humanities research engagements between the university and the public are conceptualized	Krmpotich (2016)
Education	To identify third space caucuses, who self-identify as multiracial, mixed race, or racially other	Hudson and Mountz (2016)
Mentoring	To demonstrate how external mentors facilitated opportunities for mentees to shape their professional identities in the third space	McIntyre and Hobson (2016)
Social Media	To study student-managed Facebook groups as a third space between institutional teacher-managed Facebook groups and non-institutional personal space of the Facebook network	Aaen and Dalsgaard (2016)

(Continues)

TABLE 3 (Continued)

Discipline	Main Objective Integrating Bhabha's Third Space	Citation
Nursing	To challenge traditional ideologies that have shaped the development of the Nurse Practitioner role to this day	Chulach and Gagnon (2016)
Literary criticism	To study Jean Rhys's novel *Wide Sargasso Sea* as a revision of *Jane Eyre* within the conciliatory context of the third space	Tekin (2017)
Acting profession	To identify the third space where career actors construct hybrid role identities as knowledge brokers between creative arts and academia	Lam (2018)
Education	To use third space theory as a lens for a reconsideration of time as it relates to student success and achievement in school	Chase (2018)
Music Jazz	To use the third space to interpret sessions that encounter cultural crossings that play out across an uneven field of power	Cohen (2018)

they solved problems in a new way, actively capturing, describing, and ultimately interpreting the interactions between those who in the original scenario had no power (the colonized) and those who formerly held all the power (the colonizers) to interact to create something new that had not existed before. Their successes in applying this metaphorical lens in such diverse fields as education, archeology, literacy and critical human geography resonate with both researchers and practitioners who are seeing a new way of looking at the world which opens heretofore unimagined possibilities and solutions.

In a satisfying way, Dudgeon and Fielder (2006) sum up Bhabha's third space: "There is not a single third space—they are many and varied, they shift, they are spaces rather than places. They're often risky, unsettling spaces—where the security and familiarity of our own place of belonging has to be left behind" (p. 407). Bhabha (1996) comments: "The third space is thus a place of invention and transformational encounters, a dynamic in-between space that is imbued with the traces, relays, ambivalence, ambiguities and contradictions, with the feelings and practices of both sites, to fashion something different, unexpected" (p. 406).

4 | RESEARCH METHODOLOGY

To understand our concept of the Third Design Space in the context of corporate-communal open source project engagement, we used metaphor to access the unseen or unfamiliar by invoking a known entity and using it to describe a different, unknown one. Lakoff and Johnson (1980), whose work has laid the groundwork for much of the metaphorical awareness, research and analysis of the last three decades, stated: "The essence of metaphor is understanding and experiencing one kind of thing in terms of another" (p.5). Drulák (2010) asserts the idea of metaphors as concepts, and concepts as metaphors (p. 86), enabling the operationalization of metaphor for social analysis as well as for poetic expression. As such, metaphor helped us theorize through hypothetical experiments, providing "vocabularies and images to represent and express organizational phenomena that are often complex and abstract" (Cornelissen, 2006, pg. 3). Metaphor brought together complex ideas, "and through the use of metaphors, we supply 'language with flexibility, expressibility and a way to expand … language" (Weick, 1979, p. 47).

The postcolonial metaphor shaped our thinking by framing new experiences—surrounding the unfamiliar with the familiar even though the metaphor and reality did not perfectly align. The metaphor was fundamental for informing our language through complex networks of meaning (Koch & Deetz, 1981) and helped us conceptualize corporate engagement with open source software communities. Weaver (1967) notes that metaphors function in four fundamental ways: to supply concreteness of an abstract idea; to clarify the unknown; to express the subjective; and to

assist thought. Through these functions, metaphors supply a coherency that can be traced back to experiences, and postcolonialism provides a new metaphor tracked back to the experiences of corporate-communal engagement.

We have an abundance of metaphors in IT, and our narratives unfold through the metaphors that enable us to strategize, complete and theorize about IT projects. Compelling and commonly understood IT metaphors include those that characterize the Internet as the Web, as cyberspace and the information superhighway. Markham (2003) observed that the metaphor of the Internet as the information superhighway was purposefully chosen "to demonstrate the utility and everyday nature of the Internet" in stark contrast to the earlier term of cyberspace that evoked a 'utopian vision' (Puschmann & Burgess, 2014). Authors P. Isomursu, Hinman, Isomursu, and Spasjevic (2007) identified six metaphors as powerful creative tools for designing mobile Internet apps.

Researchers in information systems who draw on a long tradition of using metaphors as a lens on their work include Hirshheim and Newman (1991), Kendall and Kendall (1993, 1994) and Madsen (1994). Davison, Boswood, and Martinsons (2004) researched metaphors to communicate strategic change, while Kendall and Kendall (2010) used metaphors to understand IS design and government sustainability. Hartel and Savolainen (2016) used a conceptual metaphor methodology to document pictorial metaphors for the concept of information and recently Hekkala, Stein, and Rossi (2018) used metaphors to interpret managerial and employee sensemaking in an information systems project.

To develop our metaphor, we used data that we collected from interviews, focus groups, site visits and notes from fieldwork with corporate software professionals participating within open source software communities. We had conducted 65 hour-long interviews, completed over a period of three years, with developers, managers and executives from 43 different organizations in the US, UK, Australia, Canada and Ireland who participate within the Linux open source environment. Our focus on the Linux open source environment centred on our involvement with the Linux Foundation and their sponsored projects (including the Linux kernel, OpenMAMA, Yocto, SPDX and FOSSology).

Our fieldwork was structured to enable us to capture new and emerging issues in corporate engagement with open source projects. Using semi-structured interviews, we were able to not only solicit precise answers to structured questions but also solicit broader discussions and stories around the changing nature of open source project engagement. The transcripts from both the precise and the broad answers served as the basis by which we performed our analysis. Capturing, transcribing, and interpreting the entire discussion enabled us to reflect on emerging topics that grow from corporate engagement with open source projects, including postcolonialism. Much of what we did was derived from long answers or stories, not necessarily the pointed answers. When participants answered by recounting stories, it enabled us to delve deeper (Kendall & Kendall, 2012).

Researchers introduced themselves, and the participants were briefed on the overall research question concerning corporate engagement with the open source community. Table 4 provides some sample interview questions from our interviewing protocol that we asked participants. Interviews ranged in length from 45 minutes to 60 minutes.

We conducted semi-structured interviews, rather than a survey, so some demographics (e.g. gender and so on) were not collected. Broadly, the composition of the roles of organization members was 40% managers, 55% developers and 5% executives. Figure 1 depicts the percentages of these roles represented in our interviewees.

We focused on the Linux Foundation because of their successful brokerage of open source software communities with similar support and structure. Software professionals serving both corporate and community interests are representative of the Linux Foundation open source environment, as this environment is predominately comprised of corporate members.[1] At a broad level, nearly "50% of all work contributed to open source software projects has been provided Monday to Friday, between 9 am and 5 pm," serving as a valuable indicator of corporate-communal engagements (Riehle, Riemer, Kolassa, & Schmidt, 2014, pg. 4). More specifically within the Linux Foundation open source environment, OpenDaylight (now part of the umbrella Linux Foundation group for open networks called LF

[1]https://www.linuxfoundation.org/members/corporate

TABLE 4 Ten sample interview questions drawn from our interview protocols

Interview Questions That Encouraged Extended Answers and Storytelling
How does participation in the open source community differ from participating on internal projects?
What new forms of organizational structure and process management does participation in the open source community require?
What new management structures are necessary for participation with the open source community?
Explain how issues of licensing and compliance are managed.
The open source community has often been described as a meritocracy. If you agree, why? If you don't see the open source community as a meritocracy, why not?
Do you view the open source community as democratic? If so, what is the importance to corporate members of having a democratic community?
What value does your organization receive from the open source community?
How is good corporate citizenship maintained with the open source community?
What are the critical requirements for being successful as a corporate participant and contributor in the open source community?
What are the challenges for corporate members participating in the open source community?

Networking Fund) reveals that the percentage of members directly affiliated with a corporation has reached 75%.[2] OpenStack (a Linux Foundation project) reveals that over 72% of contributions are from corporate contributors.[3] Likewise, analysis of the Linux kernel has shown that nearly 75% of members represent a specific corporation, with the remaining percentage comprised of members not revealing their corporate interests, who are affiliated with academe, or are unknown (Corbet, Kroah-Hartman, & McPherson, 2012), with over 1,400 companies contributing to the kernel in 2017.[4] While the entirety of a Linux Foundation open source project is not exclusively corporate members, the role that corporate members play in any given open source context can certainly be a principal one. It is from this position that we collected field data on how software professionals from corporations engaged communities to co-create software that benefits all members. In the Third Design Space, corporate and tribal are not singular characteristics ascribed to one person or not. Instead corporate and tribal are former metaphors from the early days of software development and represent the ways of knowing open source engagement. The people we interviewed were capable of speaking to both. Figure 2 depicts the variety of organizations from which our interviewees were drawn.

All field data were transcribed into written records by professional transcriptionists and placed in a project repository, accessible to all authors. We used qualitative methods to understand the data from multiple perspectives, following iterative steps informed by Morgan (1986). In this, we identified vocabulary used to express postcolonialism in the extant literature. We reviewed essential texts on colonialism and postcolonialism (Bhabha, 1994 and 1996; Frenkel, 2008; Kohn, 2012; Loomba, 2015; Moje et al., 2004) to develop a set of key, literature-informed terms used to explore our field data.

The research team evaluated findings based on alternative interpretations from research members as outlined by Koch and Deetz (1981). We used the postcolonial lens as a way to visualize and conceptualize corporate-communal engagements, providing a focus for searching the data for evidence of the Third Design Space. Specifically, we combed the rich data for evidence of the terms characteristic of postcolonialism, looking for how messages chain out in shared rhetorical visions in the construction of a social reality amongst open source software community members (Bormann, 1972, 1982). Following this approach, we examined the identified portions of the field data to illustrate how the values and customs of corporate contributors and open source software communities transformed to enable software design. We purposely chose quotations symbolic of the dual nature of design participants and selected the

[2]https://siliconangle.com/2018/01/24/linux-foundation-creates-new-umbrella-organization-open-network-projects/
[3]http://stackalytics.com/
[4]https://www.linuxfoundation.org/blog/2017/10/2017-linux-kernel-report-highlights-developers-roles-accelerating-pace-change/

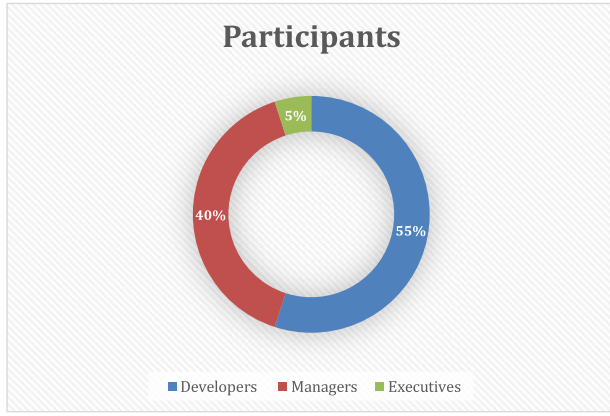

FIGURE 1 Interviews were conducted with developers, managers and executives [Colour figure can be viewed at wileyonlinelibrary.com]

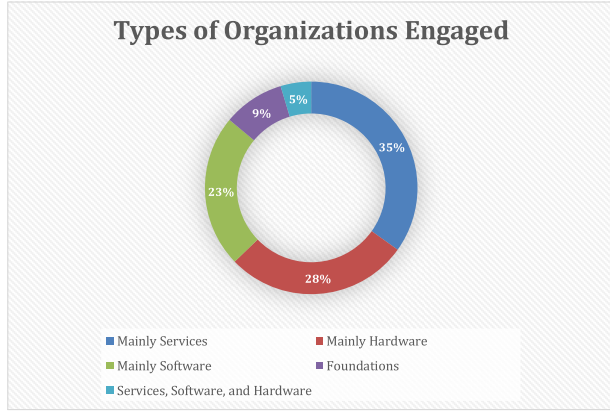

FIGURE 2 Interviewees came from a wide range of organizations [Colour figure can be viewed at wileyonlinelibrary.com]

most compelling quotations that placed the interviewee's positions in high relief to reveal the values, actions and behaviours that constitute the new forms that exist in corporate-communal engagements.

The following section explains our interpretive findings. Our primary focus was on explicating postcolonialism to theorize the Third Design Space. Drawing on Bhabha's construction of postcolonialism we searched our transcripts and other data for depictions of colonial powers, tribes and the Third Design Space with outcomes that reveal new approaches to corporate-communal software development.

5 | EMPIRICAL FINDINGS

To examine postcolonialism as a metaphor for corporate engagement in open source software communities, we searched the empirical material consisting of all transcribed field notes found in the project repository for evidence of colonizer terms (Table 4) that were mentioned as either a legacy or current approach. Next, we searched for tribe member terms (Table 5) to determine whether participants in our study either longed for the earlier days of open source coding or had not yet become weary of independent tribes of hackers. Finally, we searched using key terms (Table 6) for the Third Design Space to see whether the postcolonial terminology was used in the discourse.

The terms shown in the tables were apparent throughout our collected empirical material. We have included some of the more revealing participant quotations and structured them within our interpretative categories to assist in making sense of the nature of design participants in corporate-communal engagements. Specifically, we used the terms as a spotlight to illuminate three postcolonial principles evident in our research.

TABLE 5 Colonizer search terms gleaned from postcolonial literature

Colonizer Search Terms		
Acquire (s, ed)	Empire	Occupat (ion)
Aggress (ive, ion)	Expan (d, sion, ionism)	Patriarchy
Annex (ation, ed)	Exploit (ation)	Power (ful)
Authority	Govern (ance, ment)	Protect (ion)
Colonial (ism, ist)	Imperial (ism, ist)	Regulat (e, ion)
Coloniz (ation, ed)	Interven (e, tion, tionism)	Rule
Control	Kingdom	Subjugate
Domain	Migrat (e, ion)	Suprem (acy, e)
Domina (nce, tion)		

TABLE 6 Tribal search terms gleaned from postcolonial literature

Tribal Search Terms		
Accommodat (e, ing)	Native	Subjugation
Compliant	Obedient	Submissive
Cultural	Parochial	Subordinated
Deferential	Passive	Subservient
Docile	Powerless (ness)	Survive
Domestic	Protectorate	Swarm
Homegrown	Ruled	Tradition (al)
Indigenous	Servile	Yielding
Local		

5.1 | Evidence of the colonial power

We used the language of colonial powers (colonizers) to determine whether there was any evidence of behaviour or policies of corporations that develop proprietary software, and their relationship to open source software communities as tribes. The rhetoric of the colonizer is steeped in terms such as those shown in Table 5, including such terms as *acquire*, *aggressive*, *control*, *dominate*, *power*, *subjugate* and *supremacy*. Using the colonial power terms, we examined transcripts of interviews, focus groups, field notes of site visits, and assessed contemporaneous notes of direct involvement with organizations participating in the Linux Foundation open source environment to identify the use of colonizer terms.

While the overall evidence of empire building rhetoric was light, we were still able to identify quotations that were empire building in their depictions of what was happening with for-profit organizations in their relationships with open source software communities. We purposely chose terms and quotations that were emblematic or symbolic of a colonizer's position, especially those that crystallized the attitudes expressed in the interviews after they were read and interpreted. We chose quotations that were most potent.

One of the colonialist terms that appeared in the transcripts of interviews and other data we collected was *control.* Anxiety about the looming loss of control, and adopting or inventing new ways of interacting with a changing open source software community was also evident:

> It's actually a two-edged sword, because on the one hand you basically don't have a burden of support and maintenance and all that, and you use the community to help that. And then, the other edge of

> the sword is, well, you lose control over your software. There's a special anxiety basically here, because you're working there on this code and how it should work and function and alter user experience and performance and whatnot. Now you release it upstream, so now other folks are maintaining this and adding and modifying it. You're a voice among many voices, and you don't have that type of control anymore that you used to have. A lot of people, they're not comfortable with that, but here, again, the idea is that you actually benefit the company as a whole. [36:1]

This respondent is explaining that some developers still feel more comfortable with the old development model. Habitual control that the colonial power was once so accustomed to has become diffused in an open source setting.

One participant made a perceptive comparison between the desire for control of the colonizer and the loss of control that full dialogue with the open source software community comes to represent:

> The whole point about control, and the reason why the open source community doesn't speak about that is that open source is all about losing control and playing the game of democracy in such a way that the crowd is given the direct democratic possibility of taking it in a direction they want, where individuals want. And the problem there, of course, is that that's exactly what a corporation doesn't want. [30:61]

This statement is eloquent in its depiction of an important dichotomy — fear of losing control and coming to grips with the realization that interacting with an open source software community will mean embracing new approaches that result in a loss of control over formerly corporate projects.

Another term of colonial power that appeared in our interview data was *acquire*. The acquiring company typically wants to change the acquired company to be more like them in their software development practices and behaviours. Some interviewees commented (just short of complaining), that a company they acquired wanted to continue the old ways of development, thereby retaining the existing reliable, commercial relationships and structure of before.

The acquisition-driven growth of large companies involved in open source software development is given voice in the following quotation. The speaker emphasizes acquiring companies and intellectual property (IP), and notes that these empire-building behaviours were enacted in the past:

> With companies, we often acquire IP. With that IP, which is typically the main reason we would acquire them, sometimes things don't work out. We also shed resources on a fairly regular basis, and it's not uncommon to say we acquired a company three years ago and then now we are divesting ourselves of most of that company or many of those resources that we haven't well integrated into the organization. They had brought with them code, so the example is, we had a company that we acquired. [34:1]

The above statement is especially revealing as it captures a philosophy of corporate software development, that of growing intellectual property via acquisitions. When the intellectual property has been assimilated into the colonizer, the colonized company itself is shed. Interestingly, acquisition is focused on corporate-to-corporate engagement, not on corporate-to-community engagement, suggesting that a metaphor to depict colonization of an open source software community requires more in-depth investigation to reveal a collaborative Third Design Space.

Across our multiple data sources, we found some verbal evidence of corporations as empire-building colonials. As we contemplate the meaning of corporations developing proprietary software on their own—their expressed drive to acquire others, their persistence in controlling their acquisitions and their anxiety about the loss of control when faced with open source software communities—we recognized behaviours and attitudes that evoked the archetype

of empire-building colonial powers. We turn now to look at the balance of relationships from the opposite perspective, that of the colonized, the open source software communities.

5.2 | Evidence of tribes

To understand what was happening in postcolonial relationships, we considered what the indigenous, open source tribes had done in the past and how their interactions unfolded when they were a dominated group. Bhabha (1994, 1996) affords us rich descriptors of tribal language including terms such as *passive*, *cultural* and *traditional* as shown in Table 6. We found evidence of indigenous tribal thinking among open source software community members and intimations of what they believe the future might hold. The evidence found for the tribal perspective is apparent, although sometimes understated. We identified quotations that were highly representative of the participants' thinking, expressed in tribal terms. Some of the most revealing quotations of how tribes of open source software developers handled cultural issues are presented below. Some interviewees suggested a desire to maintain the original culture of early open source software communities, inspired to remain faithful to the altruistic motivation that initially attracted them to open source development.

In the quotation presented below, the speaker touches on global differences in the way that countries, as well as companies, treat tribal culture. There is considerable concern voiced that other colonies did not share the same culture:

> But, we find that China just doesn't understand the "contribute" portion. It isn't that they wouldn't like to. They just don't have a good comprehension of that cultural model, right, where people give and then – and they get a return. And so, they will consume open source somewhat incredibly naively, but they just don't have a cultural understanding of the participation. I think they can get there, but they're not there today. Then, Europe, obviously, really gets the contribute and consume, and I find our teams in Europe and our partners, our business partners in Europe much more sensitized to the issues of contributing and consuming, much more sensitive to the issues of what it means to consume and what your obligations are as a consumer of open source, whereas other companies, they are completely oblivious to the obligations of the consumption of open source. [34:2]

Recognizing open source developers as tribal members highlights a "contribute and consume" relationship with corporations and even countries acting as empires in this relationship. Tribes may provide raw materials (code), and the colonists may leverage these materials into finished goods (proprietary products incorporating code). An important aspect of open source participation includes the return of the open sourced components of the finished goods to the community. If this relationship is misunderstood or is disrupted, slippages in engagement between corporations and communities can result, similar to the slippages Bhabha (1994) identifies between colonial powers and indigenous tribes.

While there was evidence for the conceptualization of original open source software communities as tribes through their use of words such as *cultural* and *cultural shift*, *traditional* and *passive*, it is instructive to recognize that there was little evidence that tribe members desired to remain in the impromptu, disorganized tribal past.

One interviewee spoke about the past and how it affected the present stating:

> There is tribal knowledge that we haven't articulated.

In this quote, the participant was recognizing that control had not been formed in communities.

The language present in interviews and notes pointed away from tribes (and colonial powers) as having occurred in the past and, instead, presaged an innovative way of developing software that we explore subsequently.

5.3 | Evidence of the Third Design Space

By carefully and thoughtfully examining our transcriptions of interview data, site visit notes and notes on panel presentations for key terms, we identified interviewees signifying the Third Design Space concepts, practices and behaviours. Bhabha's third space terms (Table 7) such as *communicate*, *cultivate*, *exchange*, *collaborate*, *hybrid*, *sharing* and *contribution* were apparent. Like the prior sections, we have included some of the more revealing quotations, so interviewees and other participants who are developers, managers and executives engaged in creating the Third Design Space in the Linux Foundation open source environment can vividly tell their story.

We turn now to an essential behaviour in the Third Design Space, that of collaboration. In searching for the term collaborate, we found the following quotations to be emblematic of how participants characterized their collaboration. In our interviews, one respondent noted:

> This is effectively what companies get into open source for. In the end, if you get into open source successfully, what happens is you end up collaborating with your competitors. A lot of successful open-source development is figuring out how to do that successfully. [3:38]

Another participant explained their attitude about collaboration:

> Effectively we've already divided requirements into "open" and "closed." Anything that's open we collaborate on, and we don't care who we collaborate with … Google is the most advanced containerized data center on the planet, but they don't sell that. So, technically, if they wish to sell that, they could be our competitor, but right at the moment, they're not. But collaborating, whether they actually tried to sell their products in competition with us or they're just happy to sit with it all in the Googleplex and see it develop, we don't really care. We'd have worked with them either way. [14:30]

The quotations above reveal the intricate dance of giving and taking that occurs in the Third Design Space among corporate members. The participant shows great enthusiasm for the potential fruits of this collaborative relationship that can occur in an open, Third Design Space.

One interviewee forecasted a future where not just corporations and open source software communities participate in the Third Design Space, but envisioned a world where all manner of technical people and business people are working in such a hybrid environment:

TABLE 7 The Third Design Space search terms gleaned from postcolonial literature

The Third Design Space Terms		
Agree (able, ment)	Enlighten (ment)	Involvement
Amenable	Evol (ve, ution)	Membership
Beliefs	Exchang (e, ing)	Nurtur (e, ing)
Collabor (ate, ation)	Giving	Principles
Communic (ate, ation, ing)	Grow (th)	Providing
Contribut (e, ing)	Hybrid (ity)	Sharing
Cultivat (e, ion)	Ideal (s)	Sponsor (ing)
Educat (e, ion)	Insight	Values
Emerging		

> Even developers and managers and technical leads and businesspeople are going to be operating in a hybrid space, where you're both engaged in a commercial endeavor and simultaneously at various levels in different open-source endeavors, whether you're contributing to an outside project or running the project on behalf of a corporation like we are. I think these things are important and people, being educated from all aspects of the technology industry need to learn how these mechanisms work and interact. [40:1]

The participant quoted in the above passage is astutely aware of the larger picture, predicting that the transactions occurring in the Third Design Space will become the standard for all of the IT industry (not just developers) who will all be contributing to outside projects as well as developing products for a large corporation. Hybridity is one of the many attributes Bhabha introduced as a critical concept of the Third Design Space.

Participants explicitly described sharing between corporations and the open source software community that reflected their views of their relationships in the Third Design Space:

> There are conferences that we have engineers attend. They present white papers, and they share with the community members. But, I don't think there's a whole lot beyond just sharing the technology. Certainly, as a company, we want this because we want the community code to be able to run on our platforms. But at the same time, the community also understands that we think this makes it better. [15:32]

The interviewee quoted above recognized the emergent sharing relationships occurring between corporations and the open source software community in the Third Design Space. In the longer term, if the corporation helped the community, all could benefit.

Knowledge sharing as observed in the Third Design Space is also attributed to keeping developers sharp. Here the interviewee contrasts isolated developers in corporations (part of the old colonial powers) versus those who stay smart precisely because of their interactions:

> As far as sharing knowledge, there's an HR argument to be made for participating in open communities, too, because it keeps your developers smart. I don't know if that's something that's easy to quantify, but I would love to see a research project that sort of compares the aptitude of insulated – like isolated developers in a firm versus developers in a firm who participate in communities. [17:29]

Reflecting on this, we recognized more broadly the data that pointed to the Third Design Space as helpful to individuals as well: skills are sharpened, social networks are expanded, and ways of working are improved.

Participants articulated what values hold sway in the new design environment. They defined the ways of behaving that open source developers and corporations endorse and live by in the Third Design Space. One participant provided an extensive list that echoed in some ways their original, corporate positioning of colonial power, but also revealed a transition to the Third Design Space:

> The point is, you need to have the framework in place. You need a meritocracy. You need bureaucracy. You need diversity. You need transparency. Those are the values that matter in the community. [12:29]

In the Third Design Space, when ways of behaving are articulated, aspects of a meritocracy often arise. For example, the more merit a developer has, or a project has, or their code has, the more credibility they accrue to collaborate on other projects within the Third Design Space. A meritocracy mutes the power of colonialist influence. In an open

source software community, bureaucracy is often understood as communal structure, distinct and different from the pejorative connotation of corporate bureaucracy, or administrative red tape.

An essential practice experienced in the Third Design Space is contributing or making contributions back to the open source software community. Most interviewees mentioned contributions. However, the participant quoted below said it very colourfully:

> When we looked at the relationship that we have as an institution with the Linux community, it's very much a give and take relationship. You know, we consider our contributions back to the open source community and the many aspects of our business that utilize open source software. We're always very forthcoming in giving back what we can. And, because of the way these communities are structured, and because there's a ton of private sector interest in open source right now, you have these incredibly powerful tools for business as well. This isn't the wild west of open source anymore. [29:68]

The sense of "giving back what we can" was said in the context of freely sharing without major expectations. The respondent was not implying a quid pro quo agreement.

There is strong external evidence of robust and contributory participation of former colonial powers in the Third Design Space, substantiated by recent statistics that show that approximately 75% to 92% of the contributions to the Linux kernel are now coming from a multiplicity of for-profit companies (Corbet & Kroah-Hartman, 2017; Foster, 2017) rather than unpaid developers, with no single dominant corporate or community contributor.

Our analysis of our interviews and other transcribed field data revealed that of the three, the Third Design Space was much more prevalent in this material than comments related to colonialists or tribes. The evidence was overwhelming that the participants wanted to talk about new interactions in what we called the Third Design Space. They did not want to talk about the past. They wanted to talk about the present and the future. The evidence from our analysis of field data suggests that the participants have together achieved a new approach to software development, one that embraces the process and values of the postcolonial Third Design Space. In this way, the Third Design Space then becomes an integral part of the postcolonial concept of corporate-communal software development. We modified Bhabha's third space to be the "Third Design Space" to acknowledge the significance of design practices in open source software development.

6 | THE THIRD DESIGN SPACE

The identification, analysis and interpretation of the rich data helped us define and elaborate the metaphor of the Third Design Space. The Third Design Space encompasses the cultivation of a new design environment, the creation of new design associations and the circulation of shared resources. We identify these three as constituting practices of the Third Design Space that we found supported the transformation of open source development.

We depict the Third Design Space in Figure 3. We observed how cultivation entails nurturing a design environment that is neither entirely corporate nor wholly communal but critical to both. Corporate-communal engagements in our observed open source environments are premised on a new Third Design Space, challenging what others have characterized as "cross-boundary coordination" (Kellogg et al., 2006, pg. 22). We also observed that the Third Design Space became an environment where mutual connections are created. Within the design environment, we see collaboration, shared values, knowledge sharing, contributions and hybridity. The creation of new design associations implies emergent relationships among for-profit corporations and open source software communities. Binding these two activities together, the circulation of shared design resources, including developers, code, principles and behaviours, along with project repositories, means that what developers share with the community ultimately comes back

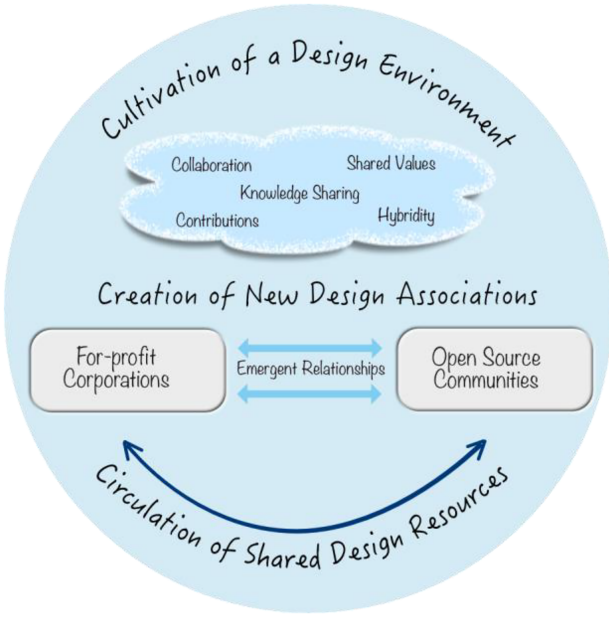

FIGURE 3 The Third Design Space

to them. It is not redistribution of design resources; it is circulation of them. In the following paragraphs, we present cultivation, creation and circulation as manifested in our interviews.

6.1 | Cultivation of a design environment

We observed that participants were becoming aware of a new design environment that was neither fully corporate nor fully communal. We saw this awareness of the Third Design Space as members talked about engagement as a natural resource that must be protected, advanced and cultivated in the interests of all. One respondent said it clearly:

> We need the community just as much as they need us. We take a really pragmatic approach to what we give back. We will give back whatever is required of the license, whatever is required of the project, and whatever makes business sense for us. Obviously, we're not going to give out our "special sauce." But we will help fix institutional problems. We will help make this code better. We will help make the community better. And, that effect is that we have a better product and that we're a better company because of this community that we helped cultivate. [29:67]

The notion of making a company better through the cultivation of global resources was a common theme. Members were aware that they played a new role as a corporate-communal member. In this regard, corporate members simultaneously constituted the community and the corporation, and from this simultaneity, the distinction between corporation and community began to transform. The Third Design Space is thus a metaphorical concept that accommodates this transformation and affords a new awareness and understanding of corporate-communal engagement.

Members expressed that it is not their corporation that gives them credibility in the community; it is their own merit. This new environment in corporate-communal engagements is built on meritocracy such that developers who make strong and valuable contributions to the community through source code, code review, or documentation will have their contributions accepted. In this, the dual nature of design stems from members being remunerated by a corporation, while at the same time their work is deemed meritorious by the community:

> The economy is a structure which is inherently hierarchal, and the open source software world is, ostensibly anyway, a meritocracy; but at the very least, there is a model in which everyone has a voice, and all voices are equal, though some voices are more equal than others. [22:4]

The cultivation of the Third Design Space was further evident as the new environment required balancing any one-sided corporate or communal influence to give way to transparency. In the following, transparency was shaped by interactions with others:

> To function well in an open community, you must be honest and transparent about your motivations and your values. That's something as human beings we are taught frequently to hide because we'll be judged for what you say and how you say it … If you are going to put your opinion out there, you need to be receptive to when other people put their opinion out to you. [38:1]

The above statement highlights that the Third Design Space accommodates meritocracy, honesty and transparency and involves learning through criticism that may not be confirmatory to any singular viewpoint. Cultivation is about creating balance amongst members such that no one corporate or communal practice dominates. Instead, a hybrid environment emerges that is more than a simple sum of corporate and communal practices. Hybridity is an integral part of the Third Design Space, encompassing not only corporations and open source software communities collaborating, but a world where all kinds of people are working in new ways.

6.2 | Creation of New Design Associations

Creation of new design associations among members, artefacts and activities were evident in the Third Design Space. These design associations were not possible for colonial powers or tribes acting on their own. Instead, new design associations emerged in the Third Design Space. Associations provided a structure through ways in which members relate to one another and act within a design process:

> What actually comes first, the modular design [of an artifact] or the ability of the communities to work independently? I don't know, chicken or the egg? You have to be aware that, by and large, no community has design documents. There will be potentially an idea exchange of something that needs to be done. More likely the first [thing] that happens is a patch that's a request for comment, and the community then engages in a dialogue about the code—a dialogue about why the code is being added, who needs it, what's the function for, how will it be used. Then, that dialogue around that code will eventually turn out and produce a finished patch that will get accepted, and that will have incrementally improved the system in some fashion. That's the design process. [9:48]

These new design associations represent initiatives to identify and solve shared problems among members, but they depend on new design associations that were unattainable until the emergence of the Third Design Space. Solutions for shared problems do not create a competitive advantage for any one member. Instead, they are non-differentiating, benefiting all members, and the Third Design Space provides an environment for such mutual associations.

Design associations are inherently built with an effort to maintain neutrality toward all members. So much so that foundations like the Linux Foundation have formed, "building sustainable ecosystems around open source projects to accelerate technology development and industry adoption," providing "unparalleled support for open source communities through financial and intellectual resources, infrastructure, services, events and training" (Linux Foundation, 2017). Such neutral brokers foster design associations, and corporations can leverage these brokered relationships into solutions that serve the needs of both corporate professionals and those of open source software communities:

> We could've [open sourced our product] simply by providing source code or setting up a small consortium type of thing. There are other models that maybe are less open that would achieve that, but beyond that, by hosting at the Linux Foundation and speaking at events like the Collaboration Summit and participating in it –we're hoping to broaden this reach outside of our vertical as well as to become a significant messaging standard for other industries, because the problem it solves is not one that's unique to financial services. [15:15]

The following respondent looks at design associations regarding technical validity, but realizes that social networking plays a significant role in designing and developing open source software:

> It's highly social and, by virtue of that then, it's technical. I mean it's always about social networking. "Who do I know?" "Do I believe in your skills?" And, "What is the emotional connection that we have?" That is all certainly based on "Yes your code is cool, it works." "It does the job." "It's clever without being difficult to understand," and "It is a true contribution back to the community." "I can use this." "You help me. I may, therefore, help you in the future." So, you're oscillating back and forth between that technical validity and the social networking, and you need comfort on both levels. [8:37]

The respondent emphasized that technical validity needed to be paired with social networking to be worthwhile, revealing a need for a social relationship that engenders trust, the willingness to help another, and in turn ask for help. This comment affords important insight into corporate participation in open source software communities. Participation is brought into sharp focus as corporations desire acceptance, and move to have their ideas, code and ultimately their products accepted by the open source software community, and eventually, the market.

The Third Design Space comes into existence as members create it, realizing it through the associations of members, artefacts and activities. It is an environment where members have an interest in exchanging material, information and corporate artefacts. No member represents the totality of the relationship. New design associations are formed, and practices and behaviours enacted to support the variety of connections. The Third Design Space is not merely about peer-to-peer collaboration, but an understanding among members whose belief structures and practical activities form bonds that unite them. It supports the emergent, dynamic relationships among members and helps manage shared innovation streams amongst oft-competitive corporate members.

6.3 | Circulation of shared design resources

As participants in open source software development balance communal knowledge against a desire for corporate differentiation, they consider how social and technical design resources are used throughout the Third Design Space. Rather than the distribution of resources, we observed circulation of resources in the Third Design Space. Resources may materialize, be shared, be harvested, or multiplied. The circulation of resources is a de-institutionalization of shared artefacts, whether as reputation, code, documents, or specifications. The resources are circulated, rather than redistributed. The good that might be gained from circulating resources is returned to participants many times over. The resources are not depleted.

Software professionals themselves want to be recognized, to have their ideas, code and products circulated by a variety of members:

> My group is responsible for community action and impact. Thus far, that has revolved around things like, "How do we communicate to the outside world about the contributions of [our] employees to various open-source communities – being how, the why, the what – and making sure that we are in the right places to talk to the right folks about what we're doing?" [38:2]

This statement is an expression by members desiring to share the value of their contributions in the Third Design Space with a broader world. Members were quite logically circulating resources because there was shared value in doing so. Hence, members collaborated on shared artefacts; no member could benefit from an artefact more than any other. One member highlighted this critical characteristic of corporate-communal engagements:

> In the old days, all of us – IBM, HP, everybody – did these common criteria security certifications. They're hugely expensive—anywhere from $300,000 to $2 million, depending on what you're doing. For the first time in the history of computing that I know of, we are finally all doing this together with a [Linux distribution] release, and we're sharing the cost. It's the same operating system, so we're taking advantage of that. So, it cut our costs by two-thirds. [16:22]

While this instance speaks explicitly to cost sharing, the value lies in the circulation of many resources, including people, knowledge and code to see a design artefact come to fruition.

In some cases, a corporation may be more hesitant, less institutionally sure-footed about how to handle relationships with the open source software community, but increasingly cognizant that changes are taking place, and over time they must be planned for:

> I think that it's often "Where to start?" and "Where to draw the line?" and "How much effort and resources are put into maintaining that contribution?" that are part of our resource planning efforts. That's a bit of factor that has typically been involved. That's a bit of a change. If we were dealing with a closed platform, then that wouldn't even be a consideration. That's something that, as time has marched on and we have got some experience with this. [pause] Definitely takes resources, not a large amount, but it takes some resource planning to ensure that time is available for doing just that. [11:7]

New behaviours were required to engage with an open platform. Changes were made, and resources were allocated when the rules of corporate engagement became aligned with open source practice. Another respondent comments that, over time, the circulation of design resources may result in a decrease in the resources required, and that a key resource was time:

> One metric we should be looking at is the amount of team strength it takes to move from one kernel version to the next. And intuitively we know that as our changes go upstream, which is something that we're strategically focused on, not as a short-term but as a longer-term effort, that the amount of resources required to migrate from kernel version to kernel version should decrease, and we should be able to measure that and the time required as well. [26:226]

Now that we have examined the meanings of cultivation, creation and circulation in the field, we turn to a discussion of how our exploration of the communal engagement with open source communities using a postcolonial lens and a metaphorical Third Design Space contribute to our understanding of corporate-communal engagement

7 | DISCUSSION

Metaphors can help explain the unknown, and with their entailments can open up new ways of thinking about old problems. A metaphor reveals features of their subject which are difficult to apprehend in other ways. Metaphors therefore are very powerful. When someone says, our company runs like a well-oiled machine, you immediately understand what they are trying to communicate. One doesn't ask "What is the machine you are referring to?" or "What do you mean by oil?"

TABLE 8 Strengths and weaknesses of metaphors used to describe open source software development

Metaphor	Key Citations	Strengths	Weaknesses
The Cathedral and the Bazaar	Raymond (1999)	Cathedral and Bazaars captured the imagination of many readers. Easy concepts to grasp that compare the differences between SDLC and agile methods.	Discussion of SDLC vs. agile has moved on. The field needs new metaphors to describe the collaboration between corporations and communities.
Common Pool Resources	Bonaccorsi and Rossi (2003), O'Mahony (2003), de Laat (2005) and Cortesi (2009)	Some researchers found the concept of a common pool or repository for open source code a desirable metaphor and adopted it. The contribution is an attempt to explain contributors and free loaders.	Rejected by Raymond (1999), this concept has a special meaning in economics where resources are depleted by overuse. Since code is not consumed, this metaphor is not a perfect fit.[5]
Trading Zones	Kellogg et al. (2006) and Westenholz, Bendikte, and Gundelach (2012) and Lewis and Usher (2016)	First metaphorical attempts to describe the collaboration between corporations and communities. Contributed by moving the discussion forward.	Research shows that corporations and communities do not trade, they share knowledge and cooperate.
Ecosystem	Bergquist and Lundberg (2001), Fitzgerald (2006), Dahlander and Magnusson (2008), Kilamo et al. (2012), Mars et al. (2012) and Mars and Bronstein (2018)	The conceptual promise of the ecosystem metaphor, based on biological ecosystems, resides in its capacity to interpret and predict, over the long-run, conditions that will influence whether alliances in human systems will survive or fail.	The appeal of the ecosystem metaphor to businesses is based on two massive misconceptions: that ecosystems are stable and communal. The usefulness of this metaphor is controversial because it is misunderstood.
Responsive Design	Germonprez et al. (2017)	Responsive design introduced as a new corporate design approach in response to the complex and dynamic activities that are the foundation of corporate-communal engagements. Contributed by articulating a new theory guided by the principles of interconnection, opportunism and domestication.	Research did not explicitly reveal direct interactions of responsive design principles. Allusions and inferences are made, but explicit examination into the direct interaction between the principles did not exist.
Postcolonial Third Design Space	Kendall K. et al. (2020) (This paper)	Helps understand the behaviours of software developers on a higher (psychological) level based on values rather than actions on a literal level. Only metaphor that implies the current environment is better than the past.	Practitioners or researchers who expect to see a literal Third Design Space or deny the inequitable power relationships of the past will not fully accept the metaphor.

[5]The authors agree with Raymond (1999) that the classic concept of common pool resources depicts an established scenario where resources are depleted by overuse, resulting in what is called the tragedy of the commons. We believe that common pool resources, developed in the field of Economics, are not an appropriate metaphor to describe open source software development because software is not depleted. Other researchers strongly disagree. They argue that the metaphor is useful if some of its entailments can be ignored. We leave it to the readers to decide whether the concept of common pool resources is an appropriate metaphor.

We summarize the metaphors that have been used to envision open source software development in Table 8. While every metaphor has its weaknesses, all of the metaphors have contributed to the understanding of open source software development.

The analysis of interview data yielded significant evidence that a Third Design Space metaphor is a viable alternative to metaphors about open source development that have been proposed in the past. The remaining question is whether there is anything that the Third Design Space metaphor offers that has not been explored previously. The answer may be that critical analysis of any subject may occur, not just on one level, but on many different levels. We experience this, for example, when we see one of Shakespeare's history plays and then realize that the premise applies to modern-day circumstances. Orbison (1984) offers three levels of critical analysis: sociohistorical, artistic and psychological.

We used Orbison's (1984) three levels of critical analysis: the sociohistorical, the artistic and the psychological to address the profounder meaning of our interviews and observations. The sociohistorical level examines social interactions of participants over time. In this study, it examines the social construction of the technology as well as the development of open source engagements among organizational participants and open source software communities. It puts open source development into an historical context, as well, urging inspection of what has transpired in open source engagements over time, i.e. historically during a colonial period and then later after the emergence of The Third Design Space during postcolonialism.

Our analysis examines the artistic level as well. The artistic level examines individual and group creativity and the output of their collaborations. It provides us with "reflection, discernment and connection with the larger world" Strauss, (2012, para. 2) and Strauss (2016). Through the process of analysis, we gain understanding and appreciation of human experience. In our study, the artistic level gets at the design of artefacts including open source software, policies for governance of communities and corporations and outcomes of meetings and collaborations. In our research it means studying the artistic level means that we are examining outputs that did not exist before the postcolonial period.

The third aspect of analysis is the psychological level. Studying this level grants insight into the symbolic meaning of actions and words revealed by individuals and groups based on the discourse exposed in interviews as well as through observations of discourse in meetings and workshops (Goodman, 2017). On this level of analysis for our study we look at the embrace of metaphors, especially reflections of the postcolonial metaphor that describe open source communities and corporations collaborate by symbolically expressing themselves and their relationships in The Third Design Space.

TABLE 9 Examining the phenomenon of corporate-communal software development on three levels

Level of Analysis	Applicable Metaphors	Key References
Sociohistorical	**Cathedral vs. Bazzar**	• **Raymond,** 1999
	Common Pool of Resources	• **Bonaccorsi & Rossi,** 2003 • **O'Mahony,** 2003 • **de Laat,** 2005
	Trading Zones	• **Kellogg et al.,** 2006 • **Lewis & Usher,** 2016 • **Westenholz et al.,** 2012
	Ecosystem	• **Bergquist & Ljungberg,** 2001 • **Fitzgerald,** 2006 • **Dahlander & Magnusson,** 2008 • **Kilamo et al.,** 2012
Artistic	**Responsive Design**	• **Germonprez et al.,** 2017
Psychological	**The Third Design Space**	• **Kendall et al., 2020 (This Study)**

A summary of the levels of analysis and the open source software metaphors that have addressed each level can be found in Table 9. Many authors have created or adopted metaphors that address the sociohistorical level. They painted vivid pictures of "what" was occurring and "who" was participating in open source software development. Metaphors like the cathedral and the bazaar, the common pool of resources, trading zones and ecosystem captured the imagination of readers and helped them better understand the literal state of open source software development. While this sociohistorical discussion was occurring, the artistic process went unremarked. A new metaphor was needed to help explain "how" this corporate-communal process was working. Responsive design is an attempt to create a picture of how collaboration takes place. Responsive design is representative of the second, or artistic level, on which creativity, resourcefulness, inventiveness and inspired design reside. Finally, on the psychological level, an attempt can be made to understand not only "how," but "why" specific behaviour is occurring. It is on this third level that the Third Design Space is useful. It allows the reader to visualize changes in practices and behaviours, along with changes in values that allow and encourage the creation of new and innovative software.

We envisioned and interpreted the Third Design Space as a metaphor that describes the postcolonial collaboration between former tribal members of open source software communities and former colonialists. While the Third Design Space arose out of prior relationships, affiliations and interactions, it is ever unfolding, leading to the new identities of software developers who are both corporate and communal. While exchanges called into existence by the Third Design Space will produce shared software products and software development methods, the process of creating new, original artefacts extends the impact of collaboration. The Third Design Space provides an innovative metaphor to form design associations through the emergent relationships, behaviours and values shared by its participants.

Based on our research, we assert that the metaphorical Third Design Space is, at its essence, a social construction embedded in the people building its environment, a historical construction influenced by past colonial and tribal thinking, an artistic or creative design environment discovering disburdenment in shared and non-differentiating technological goals, and a psychological reorientation of developer values.

Participants in The Third Design Space embolden the cultivation of a new design environment, creation of new design associations and circulation of shared design resources. This change of practices, behaviours and values could not have happened in either the tribes or the colonial powers alone. Unique cultures coming together to create something that formerly did not exist is observable in familiar situations as well as software development. The dish we call Chicken Tikka Masala does not exist in Indian cuisine, although it is on most menus of Indian restaurants outside of India (Grove & Grove, n.d.). It is a menu item referred to by one of Britain's former Foreign Secretaries, Robin Cook (2001) as "Britain's true national dish," but it is a creation of tastes developed neither in India nor in England. The dish was designed in an environment only made possible by the sharing of knowledge and the blending of cultures. For open source software development in corporate-communal settings, this is true as well.

8 | LIMITATIONS OF THIS STUDY

One limitation of the Postcolonial Third Design Space metaphor is resident in all metaphors; that it is but a metaphor, not reality, and should not be taken literally. There were no real imperial powers in corporate software development, there were no actual indigenous tribes developing software. So, one of the limitations that can hinder our capacity to use metaphors in a useful way is to act and write as if the metaphor is real life. Doing so is a mistake and that inhibits the ability of the metaphor to enlighten. It would also compel the reader to change the metaphor to an analogy, driving them into a game of making forced one-to one correspondence between the metaphor and real life. Metaphors are not real life; they are not perfectly mapped to reality. Indeed, demanding that metaphors function as if they are real life, complicates the message and strips metaphors of their power to help us see the world in new ways and diminishes their transcendent nature.

There are other limitations to the current study that could be explored to advance both theory and practice. First, we primarily explored the Linux open source environment. Our understanding of the Third Design Space could benefit from investigation of corporate-communal relationships in the context of other open source ecosystems (e.g., the Apache or Eclipse ecosystems). Second, we interviewed current corporate members who had worked in open source communities in the past, and so felt comfortable speaking to both the community and corporate ethos. Adding interviews with community members who exist solely in the community might enhance the community perspective. Third, we did not fully examine the motivations surrounding why corporations participate in corporate-communal engagements. While we know ways that corporations engage with open source software communities for leveraged development or the identification of talent, these motivations are rooted in a corporate-communal dichotomy. In our study, the motivations were different, since corporations view the engagement as more than an internal-external resource management issue. Instead, they see it as engagement in a new, jointly curated environment. Fourth, we did not explore how corporations can transition between colonial and postcolonial thinking. Corporations may move between these positions for reasons of shifting corporate needs, resource availability, or value capture. Fifth, we did not investigate the character of the members within the engagements that could lead to new understandings of shared ideologies (Stewart & Gossain, 2006), member histories (Hahn, Moon, & Zhang, 2008), or leadership decisions (Yoo & Alavi, 2004).

9 | CONCLUSION

Why should academics and software professionals in open source software communities and corporations care if we identify and conceptualize the Third Design Space? Why should they care whether these spaces represent an emergent archetype for open source participation? Correctly identifying and articulating engagement in the Third Design Space enables a more holistic understanding of the practices and behaviours that now exist, highlights what can be done to support this type of interplay and suggests what can be expected for the future. The Third Design Space is not a repository, nor is it a trading zone. It is not literally a physical space. It cannot be visited in person, or physically created through architectural design. Rather, the Third Design Space is a psychological mindset.

The Third Design Space metaphor is unique in its ability to express the creative process of interaction that takes place between open source software communities and corporate members in software development. In addition to the cultivation of a new design environment, we determined that the practices and behaviours attendant to postcolonialism support the creation of new design associations and encourage the circulation of shared resources. Together these practices and behaviours, along with values of the contributors, helped the Third Design Space to emerge. Only within this new environment is it possible to cultivate and nurture innovative practices for designing software with results and methods that represent a distinct departure from the competitive and proprietary past.

At no point in this elaboration of the Third Design Space do we imply that it is an issue of corporate good or evil. In fact, it can be a mixture of both (Kendall & Kendall, 2009a, 2009b). It is certainly true that themes of manipulation by large IT corporations for good and evil are found throughout the history of computing. Examples include the exploitation of airline information systems (Christiaanse & Venkatraman, 2002), the unfair advantage taken by the practice of bundling software with hardware (Ross, 2005) and the construction of powerful platforms that retain and expand market power (Edelman, 2014). Even *The Economist* published an article on the struggle for dominance played out by technology corporations using a *Game of Thrones* metaphor (The Economist, 2012). In the evil construction, the colonizer robs the natives of their culture and customs. On the honorable side, the colonial power builds infrastructure and pulls the tribes out of the dark ages. However, as Loomba (2015) points out, environments can be a mixture of both good and evil and the newly formed design environments that we observed do not presuppose one position (good or evil) to be more appropriate than the other. In this light, Raymond's (1999) “tribe of hackers” becomes more fully appreciated as we arrive at the realization that many open source developers had become mindful of a new design environment. They were no longer hackers, but employees of for-profit corporations,

participating in a new hybrid environment. The "tribe of hackers" has been replaced not by the colonizer, but by a new postcolonial climate inhabited by equals. Evidence for this can be found in open source projects, including meritocracy-based governance teams (Germonprez et al., 2014) and development work (Kelty, 2008).

Although a postcolonial world of software development appears to have a promising future, we should be mindful that a colonial power may attempt to reassert its hold at any time. In June of 2018, Microsoft acquired GitHub, a company that is home to over 85 million open source projects, which includes developer collaboration, and code-sharing services (Lardinois & Lunden, 2018). Repeatedly the words "acquire," and "acquisition" appeared in all of the media announcements. TechCrunch.com, the online publisher of technology news, reported that "open source software maintainers were already eyeing up alternatives and looking potentially to abandon GitHub in the wake of the deal." They went on to say: "The new Microsoft under CEO Satya Nadella strikes us as a very different company from the Microsoft of ten years ago—especially given that the new Microsoft has embraced open source—but it's hard to forget its earlier history of trying to suppress Linux" (Lardinois & Lunden, 2018).

One may ask whether IT corporations will accept the characterization of acting as "colonial powers" in the past. However, it is, in some ways, immaterial. The key is that there is an interpreter, the researcher, who recognizes the relationship between the colonizer and the tribes. This characterization is subjective of course, like an art critic evaluating a painting and projecting his or her own world onto the canvas, which may not coincide with what the artist intended. The conscious insights of the critic might also reveal what remained on the artist's unconscious level. In this paper, we theorized about the Third Design Space such that "concepts themselves are semantically not rigid or fixed (and strictly ordered in hierarchical relationships or categories) but can in a more fluid sense be applied and connected to other concepts in and through the use of metaphors" (Cornelissen, 2006, pg. 10). Thus, we recognize that, as researchers, we contribute to our understanding of corporate-communal collaboration as a reflection of a changing canvas of members, relationships, practices and information.

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