Technovation 92–93 (2020) 102042

Contents lists available at ScienceDirect

Technovation

journal homepage: www.elsevier.com/locate/technovation

When technology shapes community in the Cultural and Craft Industries: Understanding virtual entrepreneurship in online ecosystems

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ABSTRACT

With the aim of providing greater insight into the nature and dynamics of the online entrepreneurial ecosystem in the Cultural and Craft Industries (CCIs), this study investigated the novel interactions taking place among virtual entrepreneurial firms operating in a relatively new technological context i.e. cybermediary platforms. It is argued that the technologically enabled connectivity offered by these platforms helps foster a distinctive sense of virtual community. Connectivity with users and peer-firms allows a greater sense of identity, shared values, and membership that may not exist routinely. This sense of virtual community may give rise to mutually beneficial firm behaviors whereby support of other businesses becomes the norm. The literatures on sense of virtual community, e-word of mouth, online social capital and e-community are integrated to examine the entrepreneurial dynamics in a context epitomizing collaboration, cooperation and creativity. Results from 732 virtual entrepreneurial firms support the hypotheses that (i) a sense of virtual community is positively related to supporting and promoting peers in the CCIs; (ii) promoting other entrepreneurial ventures increases online social capital and (iii) this in turn creates beneficial outcomes for virtual entrepreneurial firms in the CCIs. Future research may delve even deeper into how technologies may influence the community, collaborative or competitive nature of firm behavior.

1. Introduction

Drawing support from the works of eminent scholars such as Max Weber, Joseph Schumpeter, Georg Simmel, and Emile Durkheim, Swedberg (2006) describes a link between art and entrepreneurship, as both involve the act of combining things creatively. Yet due to the inherent tensions between the economic sphere and the sphere of art, he suggests that creative industries develop a special set of organizational mechanisms to bring them together. In this study, it is proposed that a sense of virtual community serves as this mechanism to bridge creativity, technology and entrepreneurship. The research question the paper seeks to answer is: What are the effects of a sense of virtual community on virtual entrepreneurial firms in the CCIs?

In 1998, UK's Department of Culture, Media and Sport (DCMS) originally introduced the term ‘creative industries’, to denote “those industries that have their origin in individual creativity, skill and talent and that have a potential for wealth and job creation through the generation and exploitation of intellectual property”. Thus, it is an inclusive term that covers a wide spectrum of industries including artistic crafts, an industry that is central to this investigation. Cultural and Creative Industries (CCIs) are generally understood as including “architecture, archives and libraries, artistic crafts, audio-visual (including film, television, video games and multimedia), cultural heritage, design (including fashion design), festivals, music, performing and visual arts, publishing and radio” (European Commission, 2010). It is important to note that this study focuses on the analogue aspect, i.e. arts, crafts and traditional as well as contemporary expressions of heritage and culture, which is as much a part of CCI as the digital aspect i.e. film, television and software. As such, CCIs are defined as "sectors of organized activity whose principal purpose is the production or reproduction, promotion, distribution and/or commercialization of goods, services and activities of a cultural, artistic or heritage-related nature" (UNESCO, 2000).

The growth of information and communication technology (ICT) has helped bring CCIs into the limelight particularly where businesses have a significant technological component. At the crossing of ICT and CCIs new businesses are thriving, prompting research attention on virtual entrepreneurship. Virtual entrepreneurship in CCIs is also an area of practical interest to potential entrepreneurs as well as investors interested in owning the next frontier in innovation (Jakob, 2013).

Besides its growing success, virtual entrepreneurship in the CCIs is

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https://doi.org/10.1016/j.technovation.2018.06.005
Received 22 January 2017; Received in revised form 5 June 2018; Accepted 10 June 2018
Available online 28 June 2018
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unique for a number of reasons. Firstly, there are working practices and specialized knowledge that are very specific to the online nature and artisanal character (Blundel and Smith, 2013). Secondly, the associated low startup costs combined with the opportunity for self-expression make it an attractive avenue for many budding entrepreneurs particularly during the recent recession (Jakob, 2013). Thirdly, a great deal of interaction and sharing of knowledge is enabled through both formal and informal peer-networks (Kuhn and Galloway, 2015). Online platforms offer the opportunity for consumers and firms to interact, collaborate and create value in an atypical fashion (Leitner et al., 2007) and there is a distinct community approach and tendency to value creativity and community over purely economic goals (Kuznetsov and Paulos, 2010).

Thus, the focus of this paper is on entrepreneurial firms in CCIs operating via a technology-based cybermediary platform that promotes crafts. It must be noted that these firms are part of the CCIs as they make one-of-a-kind, unique products that have been designed or created by the entrepreneurs themselves, giving them a unique artisanal touch. Their product range is wide as it includes personalized high-end fine jewelry, made-to-order art, creative and unusual clothing, hand-painted shoes, accessories and other apparel often made of unusual materials, handicrafts and even 3D printed products that are custom designed by the entrepreneurs. Notably, the products are differentiated from automated, mass produced and industrial-scale goods. The descriptions emphasize that products are "creative", using individual "skills" requiring special "talent" to make, which are the defining elements of CCIs. These shared online platforms have generated profits to the tune of billions of dollars (Statista.com, 2018) with their service fees being minimal, typically averaging less than 10%. Entrepreneurs can thus keep the lion's share of their sales price. Thus, these cybermediaries not only provide avenues for individual talent, but also aid in both job and wealth creation for virtual entrepreneurs in CCIs.

Furthermore, this industry niche allows virtual entrepreneurs new to the CCIs the opportunity to use the same technological interface to connect with their customers as well as peer-firms. This technologically enabled connectivity helps foster a distinctive sense of virtual community. Their peers in the same industry who are likely to have specific resources, pertinent knowledge and experience with the cybermediary platforms may frequently aid new entrants in setting-up and operating their business (Kuhn and Galloway, 2015). These networks of relationships are important in virtual CCI communities as "…the production and distribution of both fine arts and popular culture entail relationships among a complex network of organizations…" (Hirsch, 1972: pg. 640). As explained later on, cybermediaries help facilitate these relationships in a very effective way.

Web 2.0 (which is the current version of the World Wide Web), provides the ability to connect with multiple actors online -peer businesses, co-seller networks and community members. This facilitates community interaction, ease of communication and constant contact, thereby making online exchanges much more interactive and e-community focused than before (Kollman and Krell, 2011; Cormode and Krishnamurthy, 2008). In particular, it is a boon for the smooth functioning of cybermediaries. Cybermediaries are entities offering virtual platforms that not only replicate and adapt traditional intermediaries' roles to virtual settings, but also offer new kinds of intermediation functions (Del Aguila-Obra and Padilla-Melendez, 2006). A few notable examples of cybermediaries are Etsy, Kickstarter and StoreEnvy in the United States, DaWanda in Germany and InOnIt in India, among several others.

Though some prior literature on community-based Web 2.0 tools exists, it remains predominantly centered on online social networking sites such as Facebook (Kayri and Cakir, 2010), or Twitter (Gruzd, Wellman, and Takhteyev, 2011), collaborative information sharing portals like Wikipedia (Pentzold, 2010; Baytiyeh and Pfaffman, 2010a), crowdfunding (Bi, Liu and Usman, 2017) or open source software development (Kayri and Cakir, 2010). Thus, a gap exists in the understanding of online entrepreneurial firms in CCIs – i.e. firms that combine the community aspects of Web 2.0 with e-commerce. This gap is surprising given the rapid rise of online ventures in the CCIs. The co-mingling of the virtual community with online retail has socio-cultural and technological implications that could guide empirical and theoretical scholarly inquiry, and merits special attention.

Simply put, the philosophy and artistic values embedded in the creation of aesthetically driven products coupled with the interactivity of online platforms, has created a paradigm shift by profoundly transforming how entrepreneurial dynamics operate in this context (Todorovic and Bakir, 2016). The strong sense of belonging to a community and its inherent values of helping fellow peers, have possibly transferred to the virtual context of CCIs (because of the community features of Web 2.0). It has significant repercussions as it affects both entrepreneur's interactions with competitive peers in the same industry and their own outcomes. This paper is the first known step towards understanding the entrepreneurial dynamics of a technologically enabled sense of community among the CCIs in the current Web 2.0 world.

To develop the theoretical model, the extant literature and theory on psychological sense of community (Sarason, 1974) as well as more recent work on sense of virtual community (Blanchard, 2007), virtual/e-word of mouth (Kozinets, 1999), online social capital and e-community support (Williams, 2006) are drawn upon. In the following section, hypotheses that a sense of virtual community among virtual entrepreneurial firms in CCIs will have positive effects, such that helping others eventually benefits oneself, are presented. Thus, contrary to the traditional competitive mindset, this study builds the case that promoting and supporting competitors in the same industry is not detrimental but rather instrumental in building social capital. This in turn has positive spillover effects on performance and satisfaction.

The rest of the paper is organized in four main sections. The first section presents the literature review and hypotheses. The second section, methods, contains details about the research design, sample, constructs and data collection. The third section presents the results and the last section, discussion and conclusion, elaborates on theoretical contributions, practical implications, limitations and future directions.

2. Literature review and hypotheses

2.1. Cultural and Creative Industries (CCIs) today

Interest in the CCIs from the business domain is not new as art (Albrecht, 1968), publishing (Miller, 1949), cultural consumers (Toffler, 1965) and even entrepreneurship (Peterson and Berger, 1971) in CCIs has been explored. However, it has seen a marked resurgence since the 1990s because of its economic significance, its importance for public policy and its relevance to innovation (Moore, 2014; Cunningham, 2002). The CCIs are growing quite rapidly and are now recognized as driving important changes in the global economy (Jones et al., 2016). The CCIs include businesses (and not-for-profits) of a varied nature such as those that produce performing arts (film, music), those that manufacture and/sell creative goods (crafts, couture) and those providing creative services (architecture, museums) (Smagina and Lindemanis, 2012; Hirsch, 1972). Quite often new products in the CCIs are developed either by combining traditional and new elements or by recombining traditional elements in an unconventional fashion (Messeni Petruzzelli and Savino, 2016). The CCIs differ from other industries on a number of characteristics. Many of the firms are usually small, having very few but highly skilled employees who are working part time. They are also characterized by high levels of interfirm linkages, networking and intense supply chains (European Commission, 2010). Most importantly, in order to be successful in the CCIs, firms need to be embedded in a culture of creativity (Swedberg, 2006).

The rest of this section is presented in the form of an overview of the literature and context relevant to the theoretical model and hypotheses

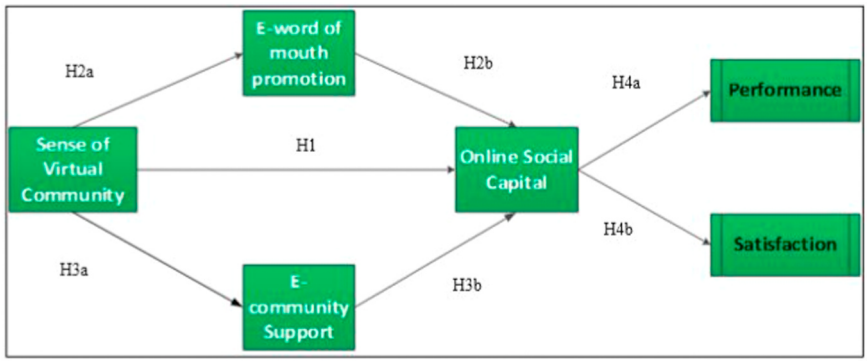


Fig. 1. Model with hypothesized relationships.

(see Fig. 1). Thus the first part introduces the unique nature of virtual entrepreneurial firms and their use of cybermediaries, which are essentially online platforms connecting multiple actors. The second part presents virtual communities that arise from this unique context, the main focus of the paper. Within this part are presented the four key virtual community constructs in the model and their relationships (sense of virtual community and online social capital, followed by e-community behaviors – E-word of mouth and E-community support), as well as the supporting literature for the ensuing hypotheses. The sequence logically follows the theoretical model presented in Fig. 1, which offers a guiding framework for the rest of this section. As presented later, the sense of virtual community promotes e-community behaviors, and also enhances online social capital. This online social capital has an interesting dynamic as it also has spillover effects on the performance and satisfaction of firms.

2.2. Virtual entrepreneurial firms and cybermediaries

Virtual entrepreneurs use the Internet primarily to achieve strategic and competitive goals, however when they utilize shared online platforms, it leads to other interesting consequences such as greater community cohesion and reduced barriers to entry (McQueen and Daud, 2013; Zutshi et al., 2006). Thus new entrants despite lacking large scale initial investments, industry-contacts, and even easy access to customers can now make forays into previously inaccessible economic spheres. The sheer volume of transactions being carried out by these websites, the revenue generated and the consumers they reach make virtual entrepreneurial firms an interesting area of study. In addition, what makes them far more fascinating from a research standpoint is a) the new context for entrepreneurship they offer b) new challenges and new advantages for the entrepreneur and c) the shift they are causing in the way the entrepreneurial process works (Kiskis, 2011).

Cybermediaries have usurped many of the functions traditionally associated with intermediaries while also performing additional functions specific to the online/cyber world. They help match the two sides involved to enable their transactions and also assist by enhancing transactions in other ways (Mantena and Saha, 2012). Their main purpose however is to provide an online marketplace to conduct business (Jallat and Capek, 2001; Brunn et al., 2002). Cybermediaries are essentially a form of multisided platforms i.e. two-sided platforms (Muzellac et al., 2015). New technologies make these novel forms of intermediation possible wherein two distinct sets of customers connect via two sided-platforms (Caillaud and Jullien, 2003). One side consists of the business customers who pay the platform for their service while the other side consists of end-users who are the consumers that do not usually pay for usage, yet both sides derive benefits from the participation of all actors (Muzellec et al., 2015; Cenamor et al., 2013). There are numerous instances of two-sided markets in the gaming industry, online shopping, human resources recruiting, music streaming, etc. but their business models and value propositions vary significantly (Parker and Van Alstyne, 2005).

By reducing the barriers of entry for small firms and micro-enterprises, cybermediaries are playing an important role in the growth of virtual entrepreneurial firms operating in CCIs at this scale of operation (Luckman, 2013). While ICT improvements and the internet help reduce the drawbacks associated with newness (Freeman et al., 1983) and smallness (Bruderl and Schussler, 1990), cybermediaries often can help eliminate these issues altogether. Using established cybermediaries that are well-known, legitimized and have established networks, resources and customer bases, allows virtual entrepreneurial firms to avoid these liabilities (Freeman et al., 1983; Shapiro and Varian, 1999). This can substitute for the lack of experience or digital skills while also neutralizing the impact of other exigent forces that could negatively affect smaller virtual enterprises. While such platforms can be found in many industries (Eisenmann et al., 2006), in this paper, attention is drawn to virtual entrepreneurs using cybermediaries in the CCIs.

2.3. Virtual communities

In the offline world, it is quite common to find that communities attractive specifically to the CCIs exist (Piergiovanni et al., 2012). In a similar vein, virtual communities also thrive in the CCIs. A virtual community is a group of people whose interactions take place primarily through ICT mechanisms (Blanchard et al., 2010) such as forums, blogs, trading areas etc. (Tickle et al., 2011). Being part of a caring community, attachment to the group, and a sense of membership, also motivate individuals to crowdsource ideas and help create greater value through creative and novel approaches (Ghezzi et al., 2017). Such online communities aid in entrepreneurial growth as well as increased resilience (Sankaran and Demangeot, 2017). Similar to real world or offline communities, virtual communities share social relationships that have mutuality and common ties (Rothaermel and Sugiyama, 2001). However, they are also characterized by richer communication modes, anonymous communications if needed as well as different social boundaries and restrictions (Abfalter et al., 2012; Malinen, 2015).

Online communities arise and perpetuate because they fulfill the specialized and often unique needs of their members. Prior research highlights four main consumer needs that online communities seek to address, namely, interest, relationship-building, transaction and fantasy (Hagel and Armstrong, 1997). Thus, there are four ensuing distinct types of communities (communities of interest where members have a common or shared interest, communities of relationships where the purpose is to form new connections, communities of transaction wherein financial transactions take place and communities of fantasy such as those involving online role-playing games).

However, certain Web 2.0 cybermediaries like Etsy or DaWanda cross these lines and embody characteristics of three types of communities (i.e. all but the fantasy aspect). Individuals and businesses are connected in such cybermediary communities through different shared

interests such as their interest in creative work, appreciation of movie fandoms or a shared love for antiques. There are strong personal and social elements as well because the virtual entrepreneurs in CCIs share an important life experience (starting up their own business), along with facing similar challenges and problems that confront them. Finally, it is a community of transactions as people from different parts of the world can buy and sell a large variety of non-mass produced items.

2.3.1. Sense of virtual community

The origins of the theory of sense of community can be traced to seminal works (McMillan and Chavis, 1986; Sarason, 1974) in which a psychological sense of community was the overarching value that defined community psychology. Its original conceptualization, McMillan (1996; pg. 315) describes as the "spirit of belonging together, a feeling that there is an authority structure that can be trusted, an awareness that trade, and mutual benefit come from being together, and a spirit that comes from shared experiences that are preserved as art". Sarason, (1974; pg. 157) defined it as "the perception of similarity to others, an acknowledged interdependence with others, a willingness to maintain this interdependence by giving to or doing for others what one expects from them, and the feeling that one is part of a larger dependable and stable structure". Studies pertaining to psychological sense of community over the last four decades eventually led to recognition of the importance of context specificity (Hill, 1996), and it's adaptation to the online/virtual setting as "sense of virtual community" (Blanchard and Markus, 2004).

Sense of virtual community is therefore defined as "members' feelings of membership, identity, belonging, and attachment to a group that interacts primarily through electronic communication" (Blanchard, 2007; pg. 827). Important aspects of sense of virtual community thus include 'membership' i.e. feelings of belonging towards the virtual community, 'influence' as virtual community members influence other members, 'immersion' referring to a state of flow which is experienced, a belief that other members share similar histories, a common place and similar experiences, the expectation that by being part of the community one's needs would be met and finally, knowing that one's opinions and actions matter (Boyd and Nowell, 2013; Koh and Kim, 2003).

The sense of virtual community experienced by community members has relationship-building potential (Bauer and Grether, 2005). Though the formation of virtual communities has become easier with developments in ICTs that enable their creation, their maintenance needs attention. Virtual communities are sustained by the sense of virtual community i.e. by making members feel responsible for their community relationships, for contributing to the community and for creating value for others (Sutanto et al., 2011). For example, members of knowledge-creating virtual communities with a high sense of virtual community create value by increased knowledge contribution (Chen et al., 2013). Similarly, members of community-focused cybermediaries who are part of CCIs, would create value for other virtual enterprises by supporting members of their virtual community through online community behaviors.

2.3.2. Online social capital

Defining social capital is a challenging task as its conceptualizations are varied and multifaceted (Newton, 1997; Putnam, 2000). Coleman's (1988) definition of social capital emphasizes the resource-like nature of social capital i.e. as the resource that accrues due to personal relationships and as a means for achieving certain ends. Thus, it may be understood as being similar to financial capital - it is a resource that is accumulated and its usage creates more of the same. In social capital, it is personal relationships and ensuing benefits that are created (Williams, 2006). In addition, given the multitude of possible conceptualizations, it should be made clear at the outset that for purposes of this study, online social capital is viewed as an outcome (instead of the process or network).

There is consensus in the literature that social capital consists of ties outside of an individual's closely-knit circle as well as social ties with family members, close friends, friendly neighbors, and supportive co-workers (Putnam, 2000, 2002; Granovetter, 1973, 1983). Thus there are some social connections that offer access to greater information and more knowledge while others involve closer relationships with deeper exchanges (Rotolo and Messeni Petruzzelli, 2013; Chandra and Leenders, 2012). These personal and extended relationships as well as indirect relationships play an important role in the entrepreneurial process and allow entrepreneurial firms access to diverse information sources as well as resources (Dubini and Aldrich, 1991).

Williams' (2006) work brought the social capital construct into the online world. ICTs have the capacity to lead to higher bridging social capital as people from all walks of life can interact, and communication is faster, cheaper and more decentralized (Haythornthwaite, 2002). Indeed online communities foster a great deal of community feeling that can lead to higher social capital among its members. The sense of virtual community arising due to the internet's features of lowered barriers when it comes to time and space, enable the creation of stronger communities, with fewer restraints (Mandelli, 2002). Thus, sense of virtual community fosters not only trust (Mandelli, 2002) but also enables community members to learn much more about each other and bond over shared interests (Valenzuela et al., 2009; Ulhøi, 2005). It leads not only to direct bonding but also knowing and learning more about "friends-of-friends" i.e. the creation of bridging social capital. Social pressure and reputation play a key role when it comes to repeat interactions and frequent engagement among different actors (Fainmesser and Goldberg, 2018). Often network membership may be unplanned but by identifying with a community and becoming an integral part of it, members can then engage in cooperative and supporting behaviors (McMillan and Chavis, 1986; Fainmesser and Goldberg, 2018). Thus, sense of virtual community fosters many of the composite elements that comprise online social capital such as a commitment to the online community, wanting to continue belonging to the community, providing social support and contacts, trusting community members and generally being cooperative and collaborative (Petrovčič et al., 2016) which are valuable for virtual entrepreneurial firms in the CCIs. This leads to the first hypothesis.

H1. *Virtual entrepreneurial firms in CCIs that have a higher sense of virtual community will have greater online social capital.*

2.3.3. Online community behaviors

Supportive behaviors as an offshoot of sense of community have been seen in offline communities (Prezza and Costantini, 1998). Though they may differ in many ways, virtual communities are similar to their real world counterparts with regard to support (Jawecki et al., 2011). Supportive community behaviors aim to create value and enable the sharing of information with virtual community members (Gaston-Breton et al., 2009). Cooperation in such community-based cybermediary markets is differs from traditional markets owing to network effects and the sense of virtual community (Mantena and Saha, 2012; Mandelli, 2002). The two main online community behaviors focused on in this study are e-word of mouth promotion and e-community support through financial transactions.

2.3.3.1. Virtual/e-word of mouth promotion. E-word of mouth in the general sense is defined as positive or negative statements made about a product or company via the Internet (Hennig-Thurau and Walsh, 2003). It is also defined as "the informal information transfer between different parties via electronic applications" (Wirtz, Schilke and Ullrich, 2010; pg. 277). Extant research shows that e-word of mouth helps online communities develop loyalty among community members (Kozinets, 1999) and that it is a major aspect of online interactions that has become increasingly important (Brown et al., 2007; Park et al., 2017). Cybermediary community members can curate, make and share lists of

their favorite products (purchased or otherwise) as well as view and comment on other such curated lists. An examination of these curated lists and the policies regarding the same, shows that users showcase a variety of products of different enterprises to draw positive attention to them. Thus, virtual entrepreneurial firms can promote other virtual enterprises using these e-word of mouth mechanisms, such as "favorites", "following", and "treasury list" depending on the platform, and shine the spotlight on different enterprises. In return, they may find their own enterprises favorably featured by others', due to the sense of community pervading through the group (Wirtz et al., 2010).

Firms that engage in e-word of mouth use a multitude of methods or tools available to them to help publicize or promote other businesses whether it is through online-curated lists, third-party apps or on social media accounts of the firm such as on Instagram or Facebook. E-word of mouth is more than just information (Dellarocas, 2003) as it has positive and negative connotations, opinions, experiences, and can even be a seal of approval based on context. Users trust in e-word of mouth and rely upon it in their decision-making in the online world (Choi and Scott, 2013). Thus, among the many possible benefits accruing to the senders or transmitters of e-word of mouth, the main outcomes that are seen in previous studies include enhanced product learning, impression management, social capital and reputation (Muniz and Schau, 2005; Chen et al., 2010; Dholakia et al., 2004).

Being part of the social aggregate of an online community, leads to member behaviors that are supportive and in the best interests of the community as a whole (Lakhani and Von Hippel, 2003). Thus, engaging in the promotion of other firms i.e. e-word of mouth, as part of this altruistic motivation, is not surprising. E-word of mouth promotions increase when members are engaged and connect to what they promote i.e. when members experience close connections due to a greater sense of virtual community, they are more likely to use e-word of mouth or social media tools for promotion purposes (Cheung and Lee, 2012; Mangold and Faulds, 2009). Innovatively using e-word of mouth, is beneficial in many ways (Standing et al., 2016). Online communities allow members to connect with each other, influence consumption patterns and also impact attitudes and behaviors of other community members (Kozinets, 1999). The influence of e-word of mouth behaviors on strengthening social connections and interactions, is often seen in online communities (Huang et al., 2012). Virtual communities are powerful social entities because when members engage in positive e-word of mouth behaviors and generate interest in products, they are able to accrue the benefits of these positive behaviors for themselves in the form of increased social capital (Armstrong and Hagel, 1996; Hagel and Armstrong, 1997). This interesting dynamic between sense of virtual community, e-word of mouth promotion and online social capital in the CCIs, leads to the next two hypotheses.

H2a. *Virtual entrepreneurial firms in CCIs that have a higher sense of virtual community will engage in higher virtual/ e-word of mouth promotion.*

H2b. *Virtual entrepreneurial firms in CCIs that engage in higher virtual/ e-word of mouth promotion will have greater online social capital.*

2.3.3.2. E-community support. When a sense of virtual community is diffused, generalized norms of reciprocity are seen throughout the online community. Members freely engage in behaviors that benefit others expecting that others will someday return the favor and thus, several kinds of support, both socio-emotional or economic, exist in the virtual community (Cialdini, 1993; Blanchard and Markus, 2004). As members become more comfortable, they move from social support to expressing e-community support through economic transactions, (Rothaermel and Sugiyama, 2001). Often, in an effort to show their solidarity with their CCI peers, firms will engage in e-based economic transactions. Such financial support through e-transactions has direct economic significance that merits further attention. These community supporting behaviors include two main types of e-transaction activities: (1) purchasing products from the CCI peers for use by the business (e.g. purchasing hand-crafted stationery, custom business cards, furniture or storage material for the business) or for use by business members (e.g. clothing or home decorations for personal use) (2) purchasing products from the CCI peers to utilize as inputs for their own product development. Some examples include buying various inputs for production such as fabrics needed to make custom-ordered dresses, embellishments needed to make decorative bags and shoes, or purchasing handcrafted frames that are utilized in framing art creations. Thus, rather than make either of these two kinds of purchases outside their virtual communities, the CCI peer-firms may buy from each other to show their support of community members.

Indeed, for all communities, online or real world, the sense of community experienced by members often encourages behaviors that support their fellow members (Welbourne et al., 2013). An increased sense of virtual community makes members feel more connected to the community and results in reciprocity norms and efforts to assist other members (Valenzuela et al., 2009). Financial reciprocity between peer-firms is a valuable form of e-community support.

The sense of belonging to virtual community enhances financial reciprocity (Demiray and Aslanbay, 2017) and often results from members own experience of having received financial support (Bretschneider et al., 2014). This tends to have a domino effect, wherein those that engage in it, are treating other members as close connections (Cheung and Lee, 2012). Reciprocity is one of the most important elements when it comes to social capital (Putnam, 2000). Hence engaging in financial support behavior would lead to increased social capital. Such behaviors help to nurture the norms of mutuality and online social trust, thereby enhancing online social capital (Zhong, 2011; Vergeer et al., 2011). The improved social standing that results from assisting those in the community that need it, essentially represents accrued social capital, as the benefactors are more closely connected to other members of the community (Balu, 1977). By helping others, they improve their own position within the community and become better connected (Oztok et al., 2015). These relationships between sense of virtual community, financial e-community support and online social capital in CCIs leads to the next set of hypotheses.

H3a. *Virtual entrepreneurial firms in CCIs that have a higher sense of virtual community will provide higher e-community support.*

H3b. *Virtual entrepreneurial firms in CCIs that provide higher e-community support will have greater online social capital.*

Firm performance in terms of the traditional financial metrics such as growth and sales are crucial to any endeavor (van Praag and Versloot, 2007), while personal outcomes may be valued in others. The significance of financial and non-financial metrics varies among enterprises as some entrepreneurs place greater value on personal/ psychological outcomes while others place greater significance on business performance outcomes (Dijkhuizen et al., 2016). Prior research shows that social capital is a resource that provides entrepreneurs with information, access to financial capital, emotional support, competitive capabilities, as well as legitimacy and thereby affects venture performance (Birley, 1985; Batjargal, 2003; Stuart et al., 1999; Stam and Elfring, 2008; Huang and Liu, 2017). The utilization of online social capital resources namely, communities and networks, allow people, organizations and institutions to perform better (Woolcock, 1998; Woolcock and Narayan, 2000). The effective use of social capital can help maintain measurable positive outcomes such as improved performance (Burt, 2002). This becomes more crucial in dynamic environments (Blyler and Coff, 2003). Online social capital thus creates an advantage for those that engage in it (Kwon and Rupp, 2013) and has a significant impact on performance (Verdecho et al., 2012). This relationship between offline social capital and performance could likewise be mirrored in a virtual environment. Thus,

H4a. *Virtual entrepreneurial firms in CCIs that have a high level of online social capital will exhibit higher firm performance.*

Many entrepreneurs, especially those in the CCIs, in addition to financial wellbeing, also desire outcomes such as satisfaction, innovativeness, work-life balance, satisfied stakeholders, longevity or solvency (Gorgievski et al., 2011; Reijonen and Komppula, 2007; Fatoki, 2013). Thus, to consider only a single aspect of performance (for instance, financial) may be insufficient and non-representative of the goals of entrepreneurs, especially in CCIs. Financial metrics alone provide a limited picture of the outcomes that are important to entrepreneurial ventures (Shane, Locke, Collins, 2003). Furthermore, the importance of recognizing the multidimensional nature of performance for entrepreneurial firms has been emphasized (Lumpkin and Dess, 1996; Gartner, 1985). When considering the outcomes for virtual entrepreneurial firms in CCIs, it is necessary to acknowledge that desired goals may vary between economic or non-economic. Though measuring all potential outcomes is a possibility, performance and satisfaction broadly capture the two major categories of outcomes: businesses performance outcomes and personal outcomes (Gorgievski, Ascalon and Stephan, 2011).

Online social capital (and its ensuing social connections and interactions) lead to increased satisfaction and performance in different settings (Oztok et al., 2015). Though direct financial benefit for pursuing the collaborative effort may not be apparent, the satisfaction of contributing to something greater exists (Cheung and Lee, 2012). The advantage of online social capital thus lies in the potential for cooperation and leads to increased performance, collaboration, and satisfaction (Verdecho et al., 2012). Given the importance of satisfaction as an outcome for virtual entrepreneurial firms in CCIs and the connection to online social capital, the final hypothesis is:

H4b. *Virtual entrepreneurial firms in CCIs that have a high level of online social capital will exhibit higher satisfaction.*

3. Methods

3.1. Research design

Of the different modes of delivering surveys, online surveys tend to have quicker response times as well higher response rates while reaching out to geographically spread respondents that are only reachable in the online domain (Cobanoglu et al., 2001; Trochim, Donnelly and Arora, 2015; Sheehan, 2001; Klassen and Jacobs, 2001; Wright, 2005; Wyatt, 2000). Thus, online surveys were optimal for reaching out to the group of interest here i.e. virtual entrepreneurial firms in CCIs.

In order to collect data from appropriate online firms in the CCI, multiple Web 2.0 cybermediaries were considered, and Etsy was chosen. Statistics and reports show it to be at the top of the group, widely successful, interesting, and expending efforts to strengthen the online creative community among users. It is a very popular website, being the 63rd most accessed website in the US, the 171st most accessed website in the world, and has more than 54 million users worldwide (Alexa.com, 2018, Statista.com, 2018). The total 2016 sales were $2.84 billion (Proxy Statement, 2017). Additional factors considered include costs to use, reliability of cybermediary website, features available to users etc. The cybermediary (as stated on their website) has over 1.9 million active sellers using online "shops" with over 45 million products listed for sale. It has also attracted recent research attention (Luckman, 2013; Kuhn and Galloway, 2015; Abrahams, 2008; Krugh, 2014 to name a few). This platform allows anyone to become a registered user by creating a free online profile or even a seller in a few steps. The products however cannot be mass-produced. They may join online groups comprised of other businesses (called "teams") who discuss business tactics, offer support, and share tips on using social media and tools among the varied topics or interests discussed. An additional interesting feature of Web 2.0 cybermediaries is the option to review businesses, and this platform has a further unique feature allowing users to "admire" businesses. This is a measure of store reputation, which can impact buyer decisions. There is also a "treasury list" feature, which allows users to make and share a list of their favorite products from any online shop. The community features and the promotion of craft products make this an appropriate cybermediary in the CCI.

3.2. Constructs and measures

The study used primary data (online surveys) for testing the hypotheses. In addition, secondary data was used for validation purposes. Limited access was sought from the cybermediary to aggregate and data mine information publicly available of their shops. Next, a special software was developed to be used in conjunction with their Application Programming Interface (API) to gather required data. As a result, it was possible to obtain firm level data independent of the online surveys conducted. While Table 1 provides the factor correlation matrix, the average factor loadings and Cronbach alpha scores for all scales are summarized in Tables 1 and 2 and indicate satisfactory thresholds.

3.2.1. Dependent variable

There were two dependent variables explored, namely, Performance and Satisfaction.

The performance construct was measured by asking respondents to evaluate their business on a number of performance dimensions and evaluate it in comparison to other similar businesses. A sample question

Table 1
Factor correlation matrix.

Constructs	Mean	Standard deviation	CR	AVE	MSV	ASV	Online social capital	Sense of virtual community	E-Word of Mouth	E-Community support	Satis-faction	Perfor-mance
Online Social Capital	4.956	1.25	0.86	0.58	0.22	0.11	0.758					
Sense of Virtual Community	5.544	1.167	0.9	0.51	0.221	0.14	0.44	0.712				
E-Word of Mouth	5.718	1.253	0.84	0.51	0.221	0.12	0.469	0.47	0.714			
E-Community Support	5.503	1.272	0.73	0.54	0.167	0.09	0.256	0.409	0.37	0.698		
Satisfaction	3.8	1.703	0.93	0.83	0.14	0.06	0.193	0.374	0.152	0.191	0.909	
Performance	5.307	1.175	0.83	0.62	0.049	0.02	0.08	0.039	0.05	0.091	0.222	0.79

CR- composite reliability.
AVE-Average Variance Extracted.
MSV- Maximum Shared Variance.
ASV- Average Shared Variance.

Table 2
Factor loadings and reliability.

Construct	Average factor loading	Cronbach's Alpha
Sense of Virtual Community	0.703	0.899
Online Social Capital	0.833	0.862
E-Word of Mouth	0.711	0.831
E-Community Support	0.724	0.776
Satisfaction	0.905	0.932
Performance	0.790	0.833

for this sub-scale for instance asked responders to rate their business on speed in product delivery. Respondents indicated their answers on a seven-point Likert (1931) Scale, which ranged from "*much worse*" to "*much better*". Thus, the performance assessment required a comparative rating the business on a number of metrics, and items were contextually adapted to the cybermediary context from prior scales (Stam and Elfring, 2008). Dimensions pertinent to this context were utilized, i.e., speed in developing new products and services, quality of products and services and customer satisfaction ($\alpha = 0.833$). These dimensions reflect appropriate performance metrics for virtual entrepreneurial firms in CCIs.

The Satisfaction construct was measured by asking respondents about their satisfaction regarding certain aspects of the enterprise as compared to other similar businesses. For instance, the sub-scale asked about satisfaction with current business. A 7-point Likert scale from "*very dissatisfied*" to "*very satisfied*" was used. Thus, the satisfaction assessment required a comparative rating of satisfaction on a number of metrics, and items were adapted to the cybermediary context from prior scales (Cooper and Artz, 1995). Thus dimensions pertinent to this context were utilized, i.e. sales, profits and overall business ($\alpha = 0.932$).These dimensions reflect appropriate satisfaction metrics for virtual entrepreneurial firms in CCIs.

Given the heterogeneity of motivations and variability in what is personally important to an entrepreneur, an attempt was made to include not only financial rewards (Wach et al., 2015) but also the satisfaction with the typical business outcomes. This is important for entrepreneurs in CCIs as they have variability in sales, motivations and expectations. Thus, even if the firm performance metrics (for instance sales growth) ranked low in sales as compared to others, the entrepreneur could nevertheless be satisfied with their sales. This may be because they have a lower threshold or only seek legitimacy at this point, and therefore the entrepreneur could potentially indicate that the satisfaction with sales, is the same or higher than other firms. This allows the performance and satisfaction outcomes to have their own distinct importance.

Similar to prior research (Wiklund and Shepherd, 2005; Stam and Elfring, 2008), multiple measures of firm performance were gathered to ensure robustness. In addition to the two subjective measures of performance and satisfaction discussed above, an objective measure is also used - average sales per quarter. The purpose was to ensure that the subjective measures were valid, and relevant. This approach has been used previously in the extant literature (see Stam and Elfring, 2008)

3.2.2. Independent variables

3.2.2.1. Sense of virtual community. This construct was measured by asking respondents to indicate their sense of virtual community with regard to community members of the same cybermediary platform. For instance respondents were asked how much the community meant to them. This construct is measured using a 7-point Likert scale from "*strongly disagree*" to "*strongly agree*". The specific frame of reference of other peer-business on the platform was provided as the term "community" could also potentially include the company which was not of interest in this study. Providing frames of reference adds greater validity to the scale (Bing et al., 2004; Hunthausen et al., 2003). Measures for the sense of virtual community variable were taken from previously validated scales developed by Blanchard (2007) and the most recently updated Sense of Community scale released by Chavis et al. (2008). For the scale, $\alpha = 0.899$.

3.2.2.2. E-community support. This construct was measured by asking respondents to indicate the financially supportive pro-community behaviors exhibited by virtual entrepreneurial firms i.e. frequently making purchases at other platform businesses. As stated earlier, these were focused on financial supporting behaviors which encompassed e-transactions made by CCI firms at peer businesses. For instance, respondents were asked whether they financially support peer-businesses on the cybermediary platform by shopping at their peer's stores. Thus, items measuring the level of e-community support of online businesses were adapted based on the work of Rothaermel and Sugiyama (2001) and measured using a 7-point Likert scale from "*strongly disagree*" to "*strongly agree*". For the scale, $\alpha = 0.776$.

3.2.2.3. Virtual/e-word of mouth. This construct was measured by asking respondents to indicate the promotion of other similar online businesses on the cybermediary platform. Though other behaviors may be encompassed within the term e-word of mouth, the focus was on positive promotions made by CCI firms of their peer businesses such as whether they "liked" or marked stores as favorites so as to promote these peer businesses to their own admirers ad followers. These likes and favorites can be seen by the followers of the focal store, and function as word of mouth promotion in an online context. Virtual/e-word of mouth is operationalized in context specific ways such as blog reviews, negative item reviews or positive promotions via social networking sites (Wirtz et al., 2010; Chu and Choi, 2011; King et al., 2014). Based on the specific context of the cybermediary, Chu and Choi's (2011) work was used for questions regarding promotion of other businesses. Items were measured using a 7-point Likert scale from "*strongly disagree*" to "*strongly agree*". For the scale, $\alpha = 0.831$.

3.2.2.4. Online social capital. This construct was measured by asking respondents to indicate the social capital resource accumulated through the various connections of the virtual entrepreneurial firm. Online social capital relates specifically to the social capital resource built through both bonding and bridging relationships that thus include immediate ties as well as non-immediate connections. For instance, respondents were asked whether they sought advice on business decision-making from at least one business on the cybermediary platform. The measures were based on the scale developed by Williams (2006). A 7-point Likert scale was used to measure the items and it ranged from "*strongly disagree*" to "*strongly agree*". For the scale, $\alpha = 0.862$

3.3. Control variables

It is important to consider relevant control variables to ensure they do not confound the results (Aspelund et al., 2005). Studies dealing with similar samples i.e. online businesses, typically include as control variables, industry (Zhu et al., 2003), ratio of online to total sales (Klein and Wareham, 2008; Saeed et al., 2005), organization size (Witell et al., 2011; Wan, Ong and Lee, 2005), level of security of website (Lim, Sia, Lee and Benbasat, 2006), online market segments (Eggers, Hatak, Kraus and Niemand, 2017)), age of the firm (Zott and Amit, 2010), and site features (Wolk and Theysohn, 2007) among others. It must be noted that this study integrates several controls into the research design. Thus, by ensuring that all firms were operating on the same cybermediary platform, variance from technology and website design were controlled since the firms utilized the same Web 2.0 online website provided for their store fronts without differential customization options. As the focus was specifically on the CCI, and this was the only industry in the study, it did not necessitate an additional control for industry type. Similarly, the businesses on this platform are managed by

the owners and are small businesses. Thus, size variation was not an issue. Security on the cybermediary platform is well protected from a users' standpoint as the connection is encrypted and authenticated using a modern cipher suite that uses TLS 1.2 thus online security levels for all businesses are the same as well. Regarding ratio of online to total sales, only those businesses that were mainly pure plays i.e. their primary business was selling their products online, were included in this study during the data evaluation phase. In terms of segment affiliation, all the CCI firms on the platform are allowed to sell to all users of the platform be it for personal consumption or business. No distinction is made between B2B or B2C on the platform or by the CCI firms themselves. Thus, the decision to focus on a single cybermediary platform ensured that relevant firm parameters were held constant and rendered redundant the imposition of controls for technological platform, industry, web-version, security levels, website design, firm size, etc. Only one variable seemed likely to have an impact on the models i.e. age of the firm. Though all firms were less than 10 years old at the time of the study, some variation was possible and hence this was carefully scrutinized. However, as data showed no significant correlation between age of firm and the performance and satisfaction measures used, it did not merit inclusion as a control variable in the analysis.

3.4. Data collection

After corresponding with the cybermediary, the approach taken to gather data was to contact leaders of online teams (called "Team Captains") and seek permission from these leaders individually to make a "post" on their team online discussion board for members to access. Using a custom-built software, a list of all the teams on the cybermediary website was developed. This complete list contained 11,805 teams. However not all teams were active. Thus, to narrow the sample to those that were active, teams with recent activity were shortlisted by determining that a recent update to the team board or page, had been made i.e. that their page had been updated in the last six months prior to this study. As a result, 1821 teams remained on the list. For further refinement of the teams, team size was looked at, as this was a source of great variation. Four strata were created based on team size (more than 5000 members; 3000–5000 members; 1000–3000 members; less than 1000 members)

Random number generators were used to contact 100 random teams. A total of 27 teams approved the request and consented to participate in the study. The participating teams (2 each from the first two strata, 9 from the third strata and 14 from the fourth strata) represented all four strata. The ensuing distribution indicated that all team sizes were represented in the data as was the aim of using the stratified random sampling approach (Trochim et al., 2015).

To ensure maximum possible exposure, the survey post was available for 2 months and kept active through reminders and other communication (Dillman et al., 2014). Respondents were also offered a chance to win gift cards worth $200. A total of 1376 respondents clicked the survey link of which 987 began the survey leading to a response rate of 71.72%. As these were owner-operated businesses, the sample was comprised of founders or co-founders.

In-depth data screening and variable screening were also carried out. These included steps to remove responses that suffered from technical glitches, blanks, and unengaged responses, steps to detect skewness and kurtosis and examination for adequacy and common method variance. No significant issues were found. After removing incomplete surveys and applying a criterion that the businesses needs to be predominantly virtual (i.e. at least 75% of their sales must come from online sales), a sample of 732 firms remained.

An Exploratory Factor Analysis (EFA) was conducted using SPSS 23. The Maximum Likelihood extraction method was used with Promax rotation. Items that cross-loaded or loaded poorly were dropped from the analysis. The data were additionally examined to ensure validity at this stage. The data did exhibit convergent and discriminant validity based on factor loadings and examination of the pattern matrix (Hair et al., 2006). Finally, the reliability was examined and the Cronbach's (1951) Alpha values were good to excellent (George and Mallery, 2003; Nunnally, 1978). Values for Average Variance Extracted (AVE), composite reliability (CR), Maximum Shared Variance (MSV), and Average Shared Variance (ASV) are included as are the means and standard deviations in the tables below.

Table 3
Descriptive and demographic information.

Total sample size	732
N for demographic info	718–728
Business Description: **Age of Firm**	3.75 years
Business Description: **Ownership**	81% Single Owner
Owner Demographics**: Gender**	92% Female
Owner Demographics: **Age**	50% 30–49 years old
Owner Demographics: **Ethnicity**	83% identify as "White"
Owner Demographics: **Education**:	88% Some college education
Owner experience:	41.5% no experience

4. Results

The descriptive information about the businesses as well as the demographic data of the business owners is summarized in Table 3. Demographic data, which were optional, were nonetheless supplied by almost all participants.

Before testing the model, the correlations between objective and subjective measures of performance were checked to ensure that the subjective measures were representative of objective financial performance (Chandler and Hanks, 1993, 1994). The correlation was found to be $r = 0.37$ $p < .01$ which was satisfactory as per prior research (Stam and Elfring, 2008) thereby supporting the use of the subjective measures.

Structural equation modelling (SEM) was used for analysis. AMOS 23 was the statistical tool used for this purpose. The first step herein was to analyze a measurement model after which the full structural model was analyzed. Multiple measures were used to determine if the model was satisfactory and these indices are shown in Table 4.

Regarding relative Chi-square (reported as CMIN/DF) in the AMOS output, the criterion for acceptance varies across researchers however Schumacker and Lomax (2004) recommend it be less than 5, and this guideline was met. The CMIN/DF was 3.15 for the model. While some measures penalize large or small sample sizes, RMSEA and CFI appear to be less sensitive to sample size (Fan et al., 1999) and these measures were also considered for determining model fit. The Root Mean Square Residual (reported as RMSEA) has been regarded as one of the most informative criteria in SEM analysis (Byrne, 2009). While there isn't complete consensus on what the best values for RMSEA are, it is generally observed that the value should be less than 0.08 (Browne and

Table 4
Fit indices summary.

	Recommended values	Fit indices of model
Sample size	Generally at least 200 for SEM	732
CMIN/DF (relative Chi-square)	< 5	3.15
RMSEA (Root Mean Square Residual)	0.10 cutoff, < 0.08 acceptable; < 0.05 ideal	0.05
CFI (Comparative Fit Index)	> 0.93	0.942
GFI Goodness of Fit Index)	> 0.90	0.913
NNFI (Non-normed Fit Index)	> 0.90	0.933
NFI (Normed Fit Index)	> 0.90	0.917

Cudeck, 1993; Kline, 1998) for an acceptable model and ideally the value should be equal to or less than 0.05 (Kline, 1998; Steiger, 1990). This prescribed parameter was satisfactorily met as the RMSEA was 0.05. As stated earlier, another fit index that is widely used and is less sensitive to sample size, is the Comparative Fit Index (CFI) which essentially compares the model of interest to an independent model where variables are assumed to be uncorrelated (Fan et al., 1999). For an acceptable model, the CFI should exceed 0.93 (Byrne, 1994). For this model, it was 0.942. The value for GFI (Goodness of Fit Index) was 0.913 which is satisfactory as the recommendation is that it should exceed 0.90 (Byrne, 1994). The Normed Fit Index (NFI)-an incremental measure of fit – should exceed 0.90 (Byrne, 1994) with 0.95 indicating good fit. The NFI was found to be 0.917. The Non-normed Fit Index (NNFI) is also known as the Bentler-Bonnet Index and it penalizes additional parameters which not all fit indices do. The NNFI values should be greater than 0.90 (Bentler and Bonett, 1980). The NNFI was 0.933 in this case.

Thus, using structural equation modelling, the model fit was deemed satisfactory and six of the seven hypotheses received support from the results. Hypothesis 1 was supported indicating there was a statistically significant positive relationship between sense of virtual community of firms and online social capital (estimated regression weight 0.274, $p < .001$). Hypothesis 2(a) was supported indicating a positive relationship between sense of virtual community of firms and e-word of mouth practices of the virtual entrepreneurial firms examined (estimated regression weight 0.522, $p < .001$). Hypothesis 2(b) was supported indicating there was a statistically significant positive relationship between e-word of mouth of the firms and online social capital (estimated regression weight 0.361, $p < .001$). The results supported hypothesis 3(a) indicating a positive relationship between sense of virtual community of these firms and e-community support of the firms (estimated regression weight 0.390, $p < .001$). The results did not support hypothesis 3(b) indicating there was no statistically significant relationship between e-community support and online social capital. Hypothesis 4(a) was supported as well indicating there was a statistically significant positive relationship between online social capital and performance (estimated regression weight 0.211, $p < .001$). Hypothesis 4(b) was supported indicating there was a statistically significant positive relationship between online social capital and satisfaction (estimated regression weight 0.075, $p < .10$) Fig. 2.

5. Discussion

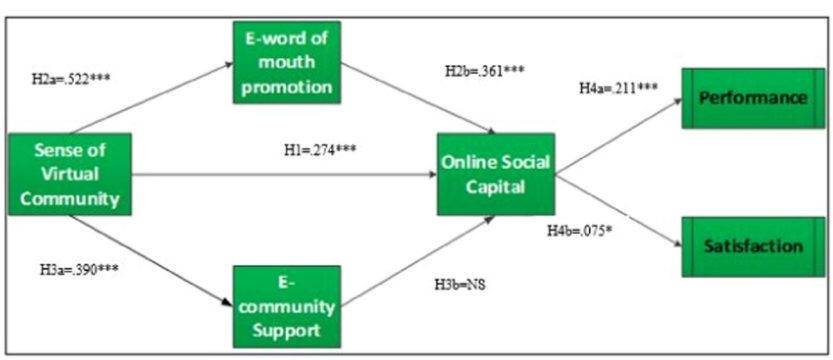
It is well established in prior literature that firms exist in competitive arenas and seek to beat out the competition to gain advantages and above average returns. At the same time, the idea of co-opetition also exists- it is not a new strategy either and is encouraged as a strategic move with far reaching benefits (Brandenburger and Nalebuff, 1996); but it is notable that firms engaging in co-opetition, do so only with one or a handful of competitors and for a limited term. Hence, the idea that competitive advantages accrue to firms that pursue the strategy of helping their peer competitors remains at odds to traditional business. However, there is an increase in the use of co-opetition in situations where creativity or innovation is sought and thus many businesses are using it for crowdsourcing ideas and creative solutions (Hutter et al., 2011). An extension of this application in creative and innovative contextual settings is seen on cybermediary platforms in the CCIs. The widespread use of peer networks, supporting businesses and working collaboratively with peer-firms seems to be the norm rather than the exception when it comes to CCIs. The rationale of competition as a primary strategy is probably widespread and true in most industries, but it seems to be contrary in the CCIs, and as a result becomes a classic example of the black swan effect (Taleb, 2010/2007). How industry matters and how technology-enabled connectivity can change the entrepreneurial dynamics, particularly in CCIs, is of great relevance to scholarship. The focus on understanding the sense of virtual community effects among virtual entrepreneurial firms in the CCIs is an important step in this direction.

Results indicated that sense of virtual community (Blanchard, 2007; Koh and Kim, 2003) does lead to greater e-word of mouth practices as well as e-community support behaviors in virtual entrepreneurial firms in CCIs. Thus, the opportunity to be part of an online community and the emphasis on togetherness and shared experience, leads to a sense of camaraderie shared by actors across the community. Additionally, it appears that this sense of virtual community translates into real gains in terms of better ties-strong and weak-among community actors (Putnam, 2000; Williams, 2006).

E-word of mouth does indeed have a relationship with online social capital. By promoting each others' products and businesses, the virtual entrepreneurial firms in the CCI develop better connections with one another, typified by reciprocity, trust and positive relationships. The hypothesized relationship that financial e-community support behaviors would lead to greater online social capital however, did not find support. A potential explanation is that while these are indeed a commonly occurring outcome due to the sense of virtual community, they do not necessarily lead to more or better relationships. The last hypothesized relationship tested was whether the online social capital of the virtual entrepreneurial firms in CCIs affects their performance and satisfaction. It appears that the various avenues of connectedness and sharing do help firms that are better embedded in the cybermediary community to get performance gains and increased satisfaction (Coleman, 1988; Mandelli, 2002; Williams, 2006).

5.1. Implications for theory

The sense of virtual community permeating across virtual businesses



***p<.001
*p<.10
NS= Not significant

Fig. 2. Model with results.

operating through the same cybermediary, directly leads to three desirable outcomes i.e. e-word of mouth, e-community support and online social capital. This study depicts how these are not symbolic or token community connections but rather offer valuable outcomes for the virtual entrepreneurial firm as they benefit from increased promotions of their business (e-word of mouth), financial reciprocity among fellow virtual entrepreneurs (e-community support) and improved ties among firms (online social capital) in the CCIs.

Typically, e-word of mouth promotion has been considered only in the context of customer reviews that promote businesses using online communication channels (Bosman et al., 2013). However, this study utilizes a unique perspective, i.e. the promotion of peers by other virtual entrepreneurial firms instead of customers is investigated, and the potential gains that accrue as transmitters are highlighted, along with the likelihood of being favorably viewed by other community actors. It is likely that the sense of virtual community prompts firms (rather than customers) to promote other CCI firms in this specific technology-based context.

Additionally, the sense of virtual community has usually been applied to either individuals or to entire communities in past studies (Blanchard et al., 2011; Sutanto et al., 2011). The use of the sense of virtual community construct and the empirical test of the related measurement scales (Blanchard, 2007) from a firm-level standpoint, is a novel contribution that helps shed light on how businesses can become a part of a community and interact as community members towards stakeholders including similar businesses. By showing that virtual entrepreneurial firms in the CCIs, can benefit from the sense of virtual community, the theories on both sense of virtual community and businesses as community members (Blanchard and Markus, 2004; Lähdesmäki and Suutari, 2012) are extended. The significance of online social capital, and the role it plays as a valuable resource in affecting the entrepreneurial dynamics and performance of such virtual firms, is yet another contribution by this study.

The sample of firms examined in this study were virtual entrepreneurial firms using cybermediary platforms to thrive in the CCIs; an important and growing group of entrepreneurs that has received minimal attention from scholars. This technology-based context is an example of the large-scale paradigm shift in the strategies emerging in CCIs as a whole (Todorovic and Bakir, 2016). Hence, rather than relegating the industry to tangential elements, it is emphasized and the very unique nature of the CCIs allows for the focus on community along with profit, without sacrificing one for the other. It remains to be seen whether the extent of collaboration, cooperation and community interaction seen in this setting is replicated in other industries. Shining the spotlight on the significance of the specific conditions applicable to the CCIs aids future researchers examining virtual entrepreneurial firms in appreciating these unique elements.

Thus, this work potentially contributes to the various theoretical streams related to (1) the sense of community and its application to virtual communities, (2) virtual entrepreneurial firms, (3) strategic implications of cooperative relationships, as well as the (4) growth of firms at the intersection of ICT and CCIs.

5.2. Practical implications

The knowledge that there are benefits of being part of the virtual community in the CCIs is useful for future entrepreneurs as well. Virtual enterprises in practice, can use the tools and technologies made available to them by the Web 2.0 cybermediary to interact with other similar businesses, create direct and indirect bonds, cross-promote each other and engage in reciprocal behaviors of a financial nature (Kollmann and Krell, 2011; Kayri and Cakir, 2010). Additionally, would-be entrepreneurs can take note that the oft-overlooked B2B e-word of mouth is highly relevant in addition to customer e-word of mouth. Thus, the permeating sense of virtual community coupled with the positive pro-community practices outlined in this study, could help the performance of virtual entrepreneurial firms in the CCIs. Considering the cybermediary platforms themselves, the patterns of utilization by the virtual entrepreneurial firms are indeed noteworthy. These businesses are able to leverage the positive aspects of being in virtual communities and are engaging in cooperative and collaborative behaviors. It is important therefore for the cybermediary platforms to ensure that they provide avenues for community building and to offer multiple ways to encourage engagement with all users of the platform. Past literature on such two-sided cybermediary platform has tended to focus on pricing considerations or the effectiveness of the investments made by the intermediaries (Voigt and Hinz, 2015). By showing the significance of the online virtual community features that cybermediaries provide, this study has potential implications for this second category.

Entrepreneurship education can also benefit from this study as instructors can help share knowledge that would aid would-be entrepreneurs interested in the CCIs., It can also supplement technology entrepreneurship courses (Mosey, 2016). It can be shown that besides a purely economic approach, a cooperative and community-centric approach is another viable option.

5.3. Limitations and future directions

This study looked at data from 732 virtual entrepreneurial firms, a group that is challenging to get access to. A specific cybermediary in the CCIs was selected to minimize variation of the platforms used by such firms to set up their online business. Though the focus on a particular cybermediary was necessary to ensure consistency in comparing businesses, this may be a drawback in terms of applicability to other cybermediaries in non-CCIs.

Another possible demographic issue is that the female gender dominated the sample. While no gender effects were expected given the models specified, it cannot be completely ruled out either without further investigation. As many of the cybermediary websites were originally only handcraft-oriented, the female to male ratio is 80:20. Hence, an attempt to ensure that half the respondents be male was not only unfeasible, but also renders non-representative the sample of entrepreneurs using these cybermediaries in the CCIs. Yet another topic to explore further would be to understand the implications of the breadth of connections among virtual entrepreneurial firms as this study was limited to measuring the presence or absence of connections. It would be also be interesting to see if any country-level differences exist in the utilization of these Web 2.0 cybermediaries.

6. Conclusion

The paper explores a hitherto unexplored avenue (that of virtual entrepreneurial firms operating in the CCIs), and brings to light the salience of technology-enabled connectivity and community and its implications for entrepreneurial dynamics in online ecosystems. A sense of virtual community has the potential to generate interesting spillover outcomes for multiple virtual entrepreneurial firms in the CCIs. Helping peers that are competing in the same industry may have positive rebound effects and accrue beneficial performance effects. Thus sense of virtual community appears to be the bedrock upon which, virtual entrepreneurial firms in the CCIs, build their relationships and develop a more supportive dynamic than traditionally seen in other more conventional industries. Future research can probe the extent and range of this phenomenon.

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