

## **A Typology of Knowledge Co-creation in Social Networks**

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### **Abstract**

Creating new knowledge is a core process in managing and enabling knowledge especially through socialisation in social networks. The social nature of social technologies and knowledge creation attracts research on knowledge creation in social networks. Social technologies are less costly but yet collaborative and diverse platforms for social networking, creating new knowledge and leveraging personal and collective knowledge. Building a knowing organisation may extend beyond knowledge sharing into creation of new knowledge. This paper explores existing aspects regarding joint creation of knowledge “knowledge co-creation” in social networks. The paper demonstrates how the empirical ideas on co-creation can be useful in exploring knowledge co-creation. This discussion explores and introduces the scope of knowledge co-creation in online social networks. We derive a typology of knowledge co-creation that suggests pathways and hypothetical propositions into exploring knowledge co-creation in social networks.

**Keywords** Co-creation, Knowledge, Knowledge Co-creation, Social Networks

## 1 Introduction

Online social network (OSNs) through popular platforms like Facebook, Twitter, Instagram, and LinkedIn are an integral part of individuals' lives and organisations as well. A large body of literature praises the relevance of OSNs for knowledge sharing in different context of life. This paper surpasses all the fuss on knowledge sharing by noting that to share knowledge, individuals have to connect, but as McDermott (1999) observes, that individuals connect to think together and thinking is the root of new knowledge. Moreover people don't just share knowledge in social networks but they actually think together to create knowledge (Lehtimäki 2016; McDermott 1999). In this context knowledge can be defined as 'a fluid mix of framed experiences, values, contextual information, and expert insight that provide a framework for evaluating and incorporating new experiences' (Davenport and Prusak 2000). Social relations are vital for enabling people to share experiences, values and contextual information through which they build new interpretations and new insights. This becomes possible because social relations naturally constitute a community (Young 2012). Communities allow knowledge to flow (McDermott 1999; Young 2012). "To leverage [such] knowledge we need to focus on the community that owns it and the people that use it, not the knowledge itself ... increasing an organisation's ability to leverage knowledge typically involves finding, nurturing, and supporting the communities that already share knowledge ..." (McDermott 1999, p. 110). The communities mentioned, are what we here refer to as social networks. We can leverage personal and collective knowledge through social network. However, there some aspects we need to know about knowledge in the era of social networks. This is what this paper attempts to discuss.

The existing body of literature emphasizes knowledge creation, sharing and transfer while overlooking the outcome of these processes, which is probably co-creating of new knowledge. Knowledge creation is a continuous process in which an individual adopts a new perspective through assimilation of a new context, view and knowledge (Nonaka et al. 2000). While knowledge sharing is the action undertaken by individuals in making knowledge available to others (Ipe 2003), knowledge transfer is the 'conveyance of knowledge from one place, person or ownership to another' (Liyanage et al. 2009, p. 122). Knowledge creation alone fails to support knowledge management competency but knowledge sharing, integration and use do support knowledge flows and competency (Saeed et al. 2017). Therefore, knowledge processes reinforce each other in shared context such as social networks, where the knowledge seeker and knowledge donor interact to generate new knowledge (Nonaka et al. 2000). The continuous social interactions between the knowledge seeker and knowledge donor suggest possibilities of knowledge co-creation.

Yeh (2012) introduces three core knowledge processes in online environments, i.e., knowledge sharing, knowledge internalisation and knowledge co-creation. There is a cyclic relation between these knowledge processes (Yeh 2012) thus constituting a co-creation process (Allee 2000). Co-creation of knowledge is ideal for an evolving organisation as it leads to observable outcomes like new knowledge, social relationships and innovation for both private and public firms (Reypens et al. 2016). Additionally, knowledge co-creation improves one's critical and multi perspective thinking skills and their ability to produce creative thoughts, logical inferences and analyses (Yeh 2012). Today, social technologies (such as social networking sites) provide a rich media (Chennamaneni and Teng 2011; Lopez-Nicolas and Soto-Acosta 2010) and are instrumental in socialisation for tacit-tacit knowledge creation (Lopez-Nicolas and Soto-Acosta 2010). Thus, instances of individual knowledge (tricks, show-how, know-how, crafts, values, assumptions, tips, best practices) comprise an explicit component that is articulable for exchange over social technologies (Panahi et al. 2016). We therefore assume knowledge intensive interactions in social networks are sufficient for knowledge co-creation among individuals.

## 2 Towards Co-Creation of Knowledge

The concept of co-creation is commonly applied to design and marketing fields but originates from the human centred design field and extends to service, participatory design, open innovation and product development (De Koning et al. 2016). A single definition of co-creation may not precisely fits in every context, but there are generally agreeable definitions of the concept. Generally, the word co-creation means, together (co-) we make something new to exist (creation) (De Koning et al. 2016). Concept based definitions of co-creation suggest that, "Co-creation is joint creation and evolution of value with stakeholding individuals, intensified and enacted through platforms of engagement, virtualised and emergent from ecosystems of capabilities, and actualised and embodied in domains of experiences, expanding wealth-welfare-wellbeing" (Ramaswamy and Ozcan 2014, p. 14). Also, co-creation is seen as "an integrative process involving at least two willing resource integrating actors, which are engaged in specific forms of mutually beneficial collaboration, resulting in value creation for those actors" (Frow et

al. 2011, p. 1). In co-creation there different parties/actors who interact and work together a joint sphere to present and merge ideas, opinions and experiences to generate a novel outcome that sustains value for all participants. The benefits and value associated with the outcome are subjective in nature and extend far beyond monetary terms (Allee 2000; Greenhalgh et al. 2016; Ramaswamy and Ozcan 2014). It can be “a tangible or intangible good or service, knowledge, or benefit that is desirable or useful to its recipients so that they are willing to return a fair price or exchange” (Allee, p. 28). Co-creation therefore builds a unified and diverse outcome acceptable to all participating actors in the co-creation space.

In this discussion, we appreciate the contribution of foundational studies in co-creation (Prahalad and Ramaswamy 2000; Prahalad and Ramaswamy 2003), but Ind and Coates (2013) argue that co-creation expands beyond the dominant management perspective of value co-creation in products and services. There are more contentions against the narrowed scope of co-creation. One is that since value is a personal evaluative judgement, it cannot be co-created but rather realised by actors as an outcome of co-creation (Hilton et al. 2012). Knowledge by its nature is a valuable resource (Hilton et al. 2012; Hughes 2014; Reypens et al. 2016). Knowledge sharing, creation and co-creation are therefore value-laden processes (Shuhua 2008) through which knowledge is built to meet its utmost usefulness. “Knowledge is abundant but the ability to use it is scarce” therefore, it needs to be built, transferred, transformed and applied (Dalkir 2011, p. 2). There is need for joint participation in creating, building and applying knowledge – “*co-creation of knowledge*”. This study focus more on co-creation of knowledge between individuals rather than between organisations. We focus on individuals because, 1 – knowledge is essentially personal and any approach to knowledge sharing must be predicated on engaging individual (Fernie et al. 2003), 2 – a “deeper level of individual engagement elicited in co-creation activities is a worthy subject of further interdisciplinary research” (Zwass 2010, p. 38). We define knowledge co-creation in this study as *a process of jointly creating new knowledge in acted through a platform of engagement that enables socialisation and individual knowing processes to occur within a social context for the benefit of all actors.*

## 2.1 A Typology of Knowledge Co-creation

By using the phrase “*Typology of Knowledge Co-creation*” we indicate that the concept of co-creation (in knowledge exchanges) will encompass a wide range of areas of concern all of which according to originating literature are core in co-creation initiatives. A prior review of co-creation by De Koning, Crul & Wever (2016) provides a meta-analysis of co-creation where joint space of creation, spectrum of co-creation, co-creation types and co-creation steps are identified. De Koning, Crul & Wever limit the scope of co-creation when one endeavours to visualise the concept in its totality. For instance the joint space of creation provides interactions between parties but we may also need to visualize what exists in their social sphere, the behaviour of actors and the motives. This paper gathers insights from 17 papers published beyond the year 2011. The papers focused on co-creation beyond the management perspective on value co-creation into several fields such innovation, design, service, and others in order to derive a wide scope of co-creation. we conducted a general search through multisubject databases particularly Google Scholar and EBSCOhost. It is true that co-creation exists beyond the widely studied management perspective on value co-creation (Ind and Coates 2013). Moreover, value is not co-created but realised due to its subjective nature (Hilton et al. 2012). Therefore, other studies (De Koning et al. 2016; Frow et al. 2015; Frow et al. 2011; Hilton et al. 2012; Hughes 2014) deduce several other forms of co-creation. In this discussion we present knowledge co-creation. Table 1 is a concept table of core aspects of co-creation rooted from studies on co-creation in different perspectives. The synthesis in table 1 is used to generate the typology of knowledge co-creation presented in Figure 1.

Concepts	Description	Authors
Co-creation Space	Co-creation occurs through social interaction and engagement between different types of actors. A platform of engagement is required for co-creation.	De Koning et al. (2016); Roser et al. (2013); Durugbo and Pawar (2014); Hsieh (2015)
Forms of co-creation	Co-creation takes different forms such as co-conception, co-design, co-production, co-distribution, co-meaning creation, co-maintenance, co-innovation etc.	Ind and Coates (2013); Frow et al. (2011); Frow et al. (2015); De Koning et al. (2016);
Layers of co-creation	Co-creation occurs at different levels or social layers of interaction – temporary, networked or neo-tribe. These layers may form through insulating, bonding, communing and belonging. Co-creators are engaged for a purpose and at different stages and levels of intimacy in the co-creation process	Rihova et al. (2013); Frow et al. (2015); Roser et al. (2013)

Motives for co-creation	Co-creators require motivation to participate Motivation may rise from, intrinsic-extrinsic and transcendent motive, technology, cultural and ethical values, co-creation outcome and the quality of social relations and overall satisfaction	Roser et al. (2013); Frow et al. (2015); Martínez-Cañas et al. (2016); Elsharnouby (2015); Sulhaini and Sulaimiah (2017)
Co-creation behaviour and processes	Co-creation ought to be view as a process of continuous interaction with external stakeholders. There two dimensions of co-creation behaviour i.e. participation and citizenship behaviour. The quality of social relations and satisfaction shape co-creation behaviour. There different processes in co-creation, i.e. identifying, resource integration, resource modification, designing, evaluation, value realisation, coordination, consultation and compromise etc.	Hilton et al. (2012); Yi and Gong (2013); Hughes (2014); Reypens et al. (2016); Elsharnouby (2015); Hsieh (2015)
Discomfort in co-creation	There are concerns of discomfort in co-creation. Cooperation and consent are important considerations while engaging individuals in co-creation	Zebracki (2016)
Co-creation outcomes	Value is not co-created but it is realised in the co-creation outcome through anticipation, assessment and application. Co-creation yields innovation, knowledge and relational outcomes. Knowledge outcomes include, assumptions, points of view, inferences, implications, creative thoughts	Reypens et al. (2016); Ind and Coates (2013); Choi and Burnes (2013)

Table 1: Co-creation Concept Table

From the evidence provided in Table 1, we present six suggestions relevant to co-creation of knowledge. Figure 1 presents a typology of knowledge co-creation deduced from the above suggestions. Since prior literature present no illustrative discussion on joint knowledge creation, the typology provides a guide into an inquiry on joint knowledge creation. The subsequent sections present an extended, systematic and clustered view of different aspects that seem to count in co-creation of knowledge as presented in Figure 1.

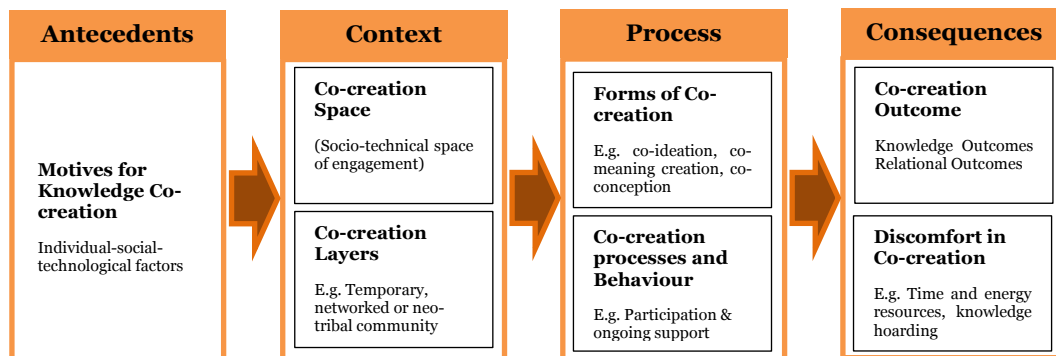


Figure 1: A Typology of Knowledge Co-creation

*The Co-creation Space and forms of knowledge co-creation* – Co-creation exists where there is an overlapping space between participants to provide some inputs while deriving some desired output (De Koning et al. 2016). The co-creation space comprises two spheres, i.e. social and technical sphere. The social sphere involves the interacting parties (co-creators) who can be the firm, employees, customers, suppliers, authorities, the world at large (De Koning et al. 2016; Frow et al. 2015; Ramaswamy and Ozcan 2014; Roser et al. 2013). The social system constitutes different layers of social interaction between unfamiliar participants to emotionally committed groups of participants (Rihova et al. 2013). On the other hand, the technical sphere involves platforms of engagement that support interaction and evolution of creation between individuals (Frow et al. 2015; Ramaswamy and Ozcan 2014). The co-creation space is a physical or online space that brings different parties together to naturally contribute and benefit from the process of co-creation. In OSNs, the co-creation space constitutes social technologies and the naturally constructed social structure of individual relations, where for instance “co-meaning creation” and “co-conception of ideas” (Frow et al. 2015; Frow et al. 2011) may occur as forms of knowledge co-creation. The co-creation space allows co-creators to interact and exchange, but holds forces that will affect how co-creators interact in one way or another. Research Agenda 1: Who engages in knowledge co-creation and what platforms of engagement are used? How effective are online social networks (as a platform of engagement) in fostering co-creation of knowledge? What are the emerging forms of knowledge co-creation in online social interactions?

*Layers of Co-creation* - Co-creation occurs at differing levels of interrelations and interaction that exists between the co-creators (Frow et al. 2015; Rihova et al. 2013). The different levels arise due to sense of belonging, commitment and emotional attached to the co-creation space (Rihova et al. 2013). Co-creators will engage in co-creation in a detached community, social bubble, temporary community or on-going neo-tribe community (Rihova et al. 2013). In OSNs interactions 'range from strongly bound communities of affliction to loosely affiliated transaction communities' (Zwass 2010, pp. 16-17). Due to cognitive, emotional and behavioural forces, co-creators will exhibit non engagement or high engagement in different levels (Frow et al. 2015). We need to remember that the strength of a community has an implication of the quality and quantity of interactions, content and relationships built in that community (Zwass 2010). Thus, while maintaining the core messages of Rihova et al. (2013) and Frow et al. (2015), we articulate an area of concern in co-creation of knowledge which we label layers of co-creation. Layers of co-creation indicates that participant engage in co-creation at different level of commitment and duration of engagement.

The formation of social interactions and relationships is long in time explained by foundations of social capital i.e. identifying, linking, bridging and bonding (Adriani 2013; Lollo 2012; Szreter and Woolcock 2004). In this discussion, we apply the processes of developing social capital to understand the formation of layers of knowledge co-creation. The identifying processes may occur naturally, as participants scan for similarities, and come together to interact (Lollo 2012). Progressively, different parties may connect and establish links purposely. Then bridging expands a network as dissimilar groups build connections and relations (Adriani 2013; Szreter and Woolcock 2004). Unlike bridging, bonding builds a stronger network as similar parties relate and interact (Adriani 2013; Szreter and Woolcock 2004). Within the theoretical foundations of social capital, we anticipate three virtual layers of knowledge co-creation distinguished by the nature of community, i.e. temporary community, networked community and neo-tribe community.

The *temporary community* is essentially unstructured with scattered actors who engage in few interactions due to several structural holes that may exist. The temporary community will also be characterised by what Frow et al. (2015) named as one-off duration of engagement. We anticipate that a temporary community emerges as actors continuously scan and link to other actors but such connections may develop into networked communities or may collapse at achievement of the co-creation goal/outcome. Co-creation also manifests in a social bubble that is a larger groups of known acquaintances, friends and family members (Rihova et al. 2013) which, presents recurring engagements that support the co-creation process (Frow et al. 2015). Such engagements may constitute a second layer of co-creation here labelled as the *networked community*. Networked communities would present a semi-structured social community with roles and trusting ties developed through linking and bridging. Beyond networked communities, co-creation occurs in a *neo-tribe community* Rihova et al. (2013) where members have stronger ties and interactions that are emotional and more frequent. Such commitment seems to emerge through bonding as continuous engagements and interactions create a sense of connection and profound similarity with others (Adriani 2013; Szreter & Woolcock 2004). Research Agenda 2: What layers of knowledge co-creation communities exist and how do online knowledge co-creation communities form?

*Motives for Co-creation* - The 'propensity of individuals to contribute is the bedrock of co-creation' (Zwass 2010, p. 32). "Knowledge sharing cannot be forced; people will only share knowledge if there is a personal reason to do so' (Huysman and De Wit 2004, p. 10). The social network environment stages a number of reasons that propel active participation in co-creation activities. We thus need to answer the question, why do individuals participate in co-creation of knowledge. Literature on co-creation in several perspectives, presents an array of motives, which are not particularly originating from a knowledge co-creation sense. To synthesize and expand on existing literature on motives for co-creation, we anticipate and define three categories of motives for co-creation of knowledge, i.e. social factors, individual factors and technology factors. *Social Factors* emerge from the social sphere of the co-creation space, where, cultural norms, ethics, values, experiences, interactions and relationships affect co-creation activities (Hsieh 2015; Martínez-Cañas et al. 2016). *Technology Factors* arise due to the dynamics and evolving role of social technologies. Although the technological milieu supporting co-creation is still undergoing rigorous investigation (Zwass 2010), studies (Martínez-Cañas et al. 2016; Yeh 2012) suggest that social technologies will shape participation in co-creation. However, the social factors posit a more significant impact on an individual's intention to use OSNs (Cheung et al. 2011). *Individual Factors* are personal mechanisms (in form of intrinsic and extrinsic needs) that encourage engagements in co-creation (Martínez-Cañas et al. 2016; Zwass 2010). However, narrowing our view to intrinsic and extrinsic needs is insufficient to define what really motivates participation in co-creation (Zwass 2010). To expand on individual related factors, studies (Füller et al. 2011; Kohler et al. 2011) suggest that co-creation experiences and satisfaction motivate future engagement in co-creation.

Research Agenda 4: What are the perceptions on richness of OSNs for co-creation of knowledge? How do these perceptions influence engagement in co-creation of knowledge? How does the social-individual-technical sphere motivate engagement in co-creation of knowledge in OSNs? Proposition – the social sphere plays a major role in shaping co-creation of knowledge in OSNs than the technical sphere.

*Co-creation processes and behaviour* – Yi and Gong (2013) derived two constructs of co-creation behaviour, i.e. co-creation participation and co-creation citizenship. Co-creation participation behaviour involves a series of activities (information seeking, information sharing, responsible behaviour, and personal interaction) that individuals assume during co-creation while citizenship behaviour involves actions (feedback, advocacy, helping, and tolerance) originating from a sense of belonging and commitment that individuals feel in relation to other co-creators. However, co-creation expands through interaction, collaboration and resource integration (Frow et al. 2011; Hilton et al. 2012; Hughes 2014). In context of knowledge creation and transfer, one need to recognise the role of socialisation (Fernie et al. 2003; Nonaka et al. 2000) and sensemaking (Bolisani 2008; Choo 2006; Shuhua 2008). Co-creation extends beyond socialisation and collaboration into meaning making (sensemaking) for individuals to achieve their purpose (Ind and Coates 2013). Sensemaking is a process of generating “one’s personal interpretation of the shared understanding” within a social context (Shuhua 2008, p.3). Practitioners and researchers need to understand interactions and sensemaking processes of individuals (Shuhua 2008). Satisfaction with co-created outcome (e.g. knowledge, innovation, product, service) shapes co-creation behaviour especially co-creation citizenship (Elsharnouby 2015). In co-creation to knowledge, researchers and practitioners ought to explore how individuals combine and modify resources in co-creation initiatives (Hughes 2014). Secondly, we anticipate ‘*co-creation outcome* → *co-creator experience and satisfaction* → *co-creation behaviour*’. It is notable however, that co-creation behaviour is also modified by the social and technology sphere of the co-creation space (Ramaswamy and Ozcan 2014; Sulhaini and Sulaimiah 2017; Zwass 2010). Research Agenda 5: what behaviours do people exhibit in knowledge co-creation in OSNs? What activities are involved in knowledge co-creation? What influences knowledge co-creation behaviour? Proposition – knowledge co-creation experience and satisfaction significantly influences knowledge co-creation behaviour in OSNs. What knowledge outcomes affect co-creation experience and satisfaction?

*Co-creation outcome* – The arising outcome of co-creation activities can take different forms such as innovation, knowledge and relational outcomes (Reyppens et al. 2016). Instances of knowledge outcomes include, new ideas, perspectives and points of view, critical thinking skills, speciality knowledge etc. (Choi and Burnes 2013; Yeh 2012). The co-creation outcome motivates future participation in co-creation (Reyppens et al. 2016). Considering knowledge co-creation in online environments leads us to anticipate intrinsic and extrinsic outcomes. Intrinsic outcomes include pursuit for creativity, novelty, vitality, challenge, learning and self-development (Legault 2016) while extrinsic outcomes include economic rewards. One needs to realise that the value of intrinsic returns is more propelling for individuals to disclosure information in technology based social networks but not extrinsic returns (Shibchurn and Yan 2015). Co-creators do individually through phenomenological instances determine the usefulness and payoffs of participating in co-creation as they interact with the co-created object (e.g. product, service, knowledge etc.) through application (consuming or experiencing), anticipation and assessment (Reyppens et al. 2016). There is need to trace how co-creators perceive the value or benefits achieved through co-creation and what benefits will motivate future engagement in co-creation (Hughes 2014). Research Agenda 6: What outcomes arise from knowledge co-creation in OSNs? What is the perceived value or benefit of knowledge co-creation? How do co-creators realise the benefits from knowledge co-creation?

*Discomfort in co-creation of knowledge* – There is willingness to exchange and transfer knowledge where new knowledge is to be received, however, the knowledge transfer process suffers a tendency of stickiness that necessitate inquiry (Héliot and Riley 2010). The word stickiness implies a tendency by individuals not to participate in the process. We assume that individuals may encounter some uncomfortable experiences that discourage participation in knowledge co-creation. Such undesirable encounters are here what we are referring to as discomfort in co-creation. The idea of discomfort in co-creation is rooted from a study by Zebracki (2016). Discomfort entails experiences that take an individual to encounter unfamiliar people and social spaces of undesired belonging (taking someone out of their comfort zone) (Zebracki 2016). Among the different ways of viewing comfort (Zhang et al. 1996), the social/psychological and aesthetic discomfort are important areas of exploration. Given that, prior literature does not attempt to explore potential discomfort in co-creation, the issue is almost suppressed and difficult to investigate. Research Agenda 7: What uncomfortable experiences emerge during knowledge co-creation in online social networks? Do such experiences deter individual engagement in co-creation of knowledge?

### 3 Discussion

Knowledge co-creation in OSN would encompass joint activities that benefit all participants and platform providers like Facebook and LinkedIn. However, not much literature discusses the emerging practice of knowledge co-creation in OSN for the reason that much emphasis lies on knowledge sharing without realising that sharing occurs to create more knowledge. This paper assumes that knowledge co-creation in OSN is symmetric and less deliberate, therefore new insights in this context would offer good guidance. We assume that a wide range of knowledge processes (create, share, exchange, transfer, build, combine, integrate, apply etc.) are involved to achieve knowledge co-creation. We argue that the philosophy of knowledge creation has evolved with societal dynamics such as social technologies – we may not be creating knowledge today, but co-creating it. Social technologies particularly social networking sites like Facebook have become a part of our daily lives thereby offering a natural platform of engagement, where consciously or unconsciously, individuals are interacting and co-creating knowledge. We therefore suppose that knowledge co-creation and flow of knowledge in OSNs should be an area of concern for researchers and practitioners. Reflecting on prior research on co-creation and knowledge co-creation, we offer our contribution by proposing a typology of knowledge co-creation that draws attention to seven aspects worth of consideration in research and practice. 1 – the knowledge co-creation space, 2 – layers of interactions in the knowledge co-creation space, 3 – the different overlapping forms of knowledge co-creation, 4 – motives for actors' engagement in knowledge co-creation activities, 5 – knowledge co-creation processes and behaviour, 6 – the co-creation outcomes, 7 – discomforts or costs in co-creation of knowledge. The typology incorporates both theoretical and empirical contributions from prior literature and pursues an extended view of the co-creation paradigm in knowledge environments. The typology aims at providing foundation into scoping knowledge co-creation to enable, support and increase knowledge at individual, firm and societal level.

### 4 Conclusion

In an organisational lens, we assume that probable actors (such as customers, firms, authorities) are continually involved in knowledge co-creation to some degree, where social interactions are variable but valuable, so the firm as a focal actor must focus on understanding the role of different actors, their contributions and motives and the outcomes of knowledge co-creation. Therefore, knowledge management scholars may need to unravel the complexities and opportunities for knowledge co-creation in social networks. Our first contribution towards this research agenda is the valuable review of representative literature on co-creation paradigm, which we articulate and tailor into co-creation of knowledge. Ultimately, our typology guides knowledge management researchers and practitioners to reflect on the scope of knowledge co-creation but also provide an insight into understanding the ongoing co-creation of knowledge in social networks currently overlooked by prior studies. We have proposed seven research agendas and underlying aspects on knowledge co-creation in OSNs.

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