Social media and innovation: A systematic literature review and future research directions

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ABSTRACT

Social media are privileged vehicles to generate rich data created with unprecedented multi-faceted insights to drive faster ideation and commercialisation of client-centric innovations. The essence of data generated through social media is rooted in the connections and relationships it enables between firms and their stakeholders, and represents one of the greatest assets for data-driven innovation. As most of the firms are still experiencing and trailblazing in this matter, the current challenge is therefore to learn how to benefit from social media's potential for innovation purposes. In the last decade, research interest has increased towards understanding social media – innovation interactions. The reliance on the wisdom of the crowd in driving major business decisions and shaping society's way of life is now well acknowledged in academic and business literature. Social media is increasingly used as a tool to manage knowledge flows within and across organisation boundaries in the process of innovation. Yet, conceptualisation of social media and innovation interaction and a systematic review of how far the field has come remains providential. Therefore, through a systematic literature review we aim to identify research trends and gaps in the field, conceptualise current paradigmatic views and therein provide clear propositions to guide future research. Based on a systematic review, 111 articles published in peer-reviewed journals and found in EBSCO Host® and Scopus® databases are descriptively analysed, with results synthesized across current research trends. Findings suggest social media is seen as *enabler* and *driver* of innovation, with behavioural and resource based perspectives being the most popular theoretical lens used by researchers. The originality of the paper is rooted in the comprehensive search and systematic review of studies in the discourse, which have not been unified to date. Implications for advancement of knowledge are embedded in the purposefully proposed theoretical, contextual and methodological perspectives, providing future research directions for exploring social media capability in innovation management.

1. Introduction

Social media are ubiquitous in individuals' lives and, increasingly in companies. Companies are striving to become or remain innovative in increasingly complex multi-actor and multi-stakeholder environments (Crossan and Apaydin, 2010), while developing new approaches and tools to connect with many aspects of the innovation ecosystem (Jha and Bose, 2016). New business models promote that firms should generate, develop and integrate knowledge in the process of innovation by engaging internal departments and external ecosystems (Chesbrough, 2003, 2006; Ritala and Hurmelinna-Laukkanen, 2013).

Knowledge has been advanced as the source of competitive advantage in today's world (Solima et al., 2016), often dispersed (Chen et al., 2018), yet increasing closer in distance with the advent of new forms of information and communication technologies (ICTs) such as social media (Kaplan and Haenlein, 2010)., In such a context of collaboration and interaction with their external environment, the challenge for companies is then to learn of the affordances of social media in organisation settings (Palacios-Marqués et al., 2015; Treem and Leonardi, 2012) and its interactions with the innovation process (Papa et al., 2018; Roberts et al., 2016). Accordingly, scholarly attention has been drawn towards understanding the role of social media in creating and

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managing knowledge flows within the organisation (Brzozowski, 2009; Inkinen et al., 2015; Scuotto et al., 2017a) and across organisational boundaries (Adams, 2014; Callaghan, 2016; Filieri, 2013; Hitchen et al., 2017). In the process of achieving competitive advantage (Del Giudice and Della Peruta, 2016; Pérez-González et al., 2017), social media has been used by firms for marketing (Cooke and Buckley, 2008), engaging customer in product or service discussions (Woffington, 2006) and co-development of products (Cheng and Krumwiede, 2018; Pohjola and Puusa, 2016). The increasing involvement of stakeholders in the firm's innovation processes coupled with increasing cost, speed and processing efficiency of ICTs has further encouraged firms to invest in social media tools (Mangold and Faulds, 2009; Scuotto et al., 2017c).

Social media, in fostering communication and connecting people and companies represent 'a vehicle for developing customer insights, accessing knowledge, co-creating ideas and concepts with users, and supporting new product launches' (Roberts et al., 2016, p. 41). Social media has been used by firms for socialisation, knowledge transfer and managerial power enactment (see Treem and Leonardi, 2012). For instance, Starbucks online platform called 'My Starbucks Idea' affords customers to provide feedback on current offerings and submit new ideas for product or service development (Gallaugher and Ransbotham, 2010). Likewise, Procter & Gamble's Connect + Develop programme has been well known for affording the firm with the ability to generate ideas from people all across the globe via innovation challenges. Increasingly, firms are experimenting new ways to leverage the widely distributed knowledge sources to improve innovation performance (Scuotto et al., 2017a). The case of the Finnish company Nokia's creation of WP7 mobile phone is arguably the most public exemplar of how firms can leverage social media in the fuzzy front end of innovation processes to generate and develop ideas through information sharing. Through social media tools, Nokia engaged its customers in real-time global co-creation process, tapping into the knowledge and feelings of its community of users.

Social media and innovation are closely intertwined (Brandtzaeg and Følstad, 2016). Business leaders have long claimed that firms need to embrace social media and provide their consumers an environment where they can socially interact, participate in firm activities, communicate and be entertained (Bercovici, 2010). Business press has accordingly been proliferated with comments on interactions of social media and innovation in competitive strategy (see Baker and Green, 2008; DuBois, 2010). Social media is shaping organisational activities (Treem and Leonardi, 2012) and increasingly those related to innovation management. Use cases in academic literature include social media for knowledge sharing, ideation, feedback loops and increasingly open innovation (see Brandtzaeg et al., 2016; Mainsah et al., 2016; Valentine et al., 2016). The fourth wave of global annual survey by McKinsey conducted after the global financial crisis revealed that 65% of firms integrated Web 2.0 technologies in their processes and those that did so intensively gained greater market share and margins (Bughin and Chui, 2010). A more recent Global Innovation Survey by BCG (2018) reported 79% of strong innovating firms integrating digitised innovation processes, bringing new ideas from external sources through use of social media, fostering an open and collaborative environment. Public sector organisations are also optimising social media for innovation endeavours. For instance, social media are used to drive social innovations through public engagement in civic projects (Eom et al., 2018; Mergel, 2016; Zheng and Zheng, 2014) and to enable reuse of socially-constructed data for policy making (Gil-Garcia et al., 2014), to name few of the novel and emerging interactions of social media and innovation in public sector.

The need to innovate is a necessary condition in a competitive market, especially where the strategic knowledge management focus is increasingly customer-centric (Archer-Brown and Kietzmann, 2018). More recent trends in publications are alluding to the moderating role of social media capability in driving innovation through new sets of value perceptions and collaboration intentions (Carlson et al., 2018)

and in enabling the exploratory-exploitative activities of internal and external knowledge transfer for innovation (Benitez et al., 2018; Garcia-Morales et al., 2018). Common to the interactions described above is the dual role of social media of 1) driving the front end of innovation process by leveraging the ability to foster socialisation through increased visibility (Treem and Leonardi, 2012) and, 2) enabling the development of existing tacit knowledge into new forms of tacit knowledge through capability building (Nguyen et al., 2015; Parinsi and Ratumbuisang, 2017). Thus, this conceptualisation is important to systematically explore and explain the social media and innovation interactions. Yet, this intrinsic relationship has not been theorised in extant literature (Jalonen, 2015; Lin et al., 2017).

Accordingly, the aim of this systematic literature review is three fold. First, we identify the general observed trends in the rapidly growing research on social media and innovation. We limit the focus based on an inclusion-exclusion criteria. Second, we situate the social media and innovation interaction in the theoretical conceptualisation of social media as *driver* and *enabler* of innovation. In doing so, we structure the manuscript in such a way that provides readers (researchers and practitioners) with a clear information on current social media paradigms. This consequently supports our third objective of identifying research gaps and providing clear research propositions for future directions. Inspired by recent systematic literature reviews (see Iden et al., 2017; Lu et al., 2018), this systematic literature review thus offers new ways to synthesise literature, report current practices and develop propositions to guide future research in the discourse. Specifically, the originality of this systematic literature review lies in its analytical focus on social media paradigms. Adopting from Guba (1990) we take the view of 'paradigm' as peculiar set of beliefs that support and guide behaviour in the discourse.

Overall, this paper makes three contributions. First, it links the broader knowledge transfer debate of social media and innovation through the concept of affordances, and hence enriches the current conversations in the academic discourse. Second, it provides a structured evaluation of theoretical and methodological perspectives in research examining social media and innovation interactions adapting from previous scholarly work on developing systematic literature reviews. Finally, it provides clear propositions and future research directions, capturing the current state of research in the field and drawing attention to potential research opportunities for future.

2. Method

A systematic literature review summarises existing evidence, identifying gaps and directions for future research (Petticrew and Roberts, 2006), hence identifying current boundaries in the discourse. It differs from a narrative review because of its methodical approach, implying a detailed description of the steps taken to select, scan and analyse the literature, aiming at reducing biases and increasing transparency (Fink, 2013; Tranfield et al., 2003). It amplifies opportunities for replication (de Zubielqui et al., 2017; Nascimento and da Silveira, 2017), allowing for review of commonalities and disparities, thus extending the knowledge in the field (Denyer and Tranfield, 2009). Despite the challenges – such as cross-discipline synthesis of data (Pittaway et al., 2004) – it remains valuable to identify the breadth of current propositions on social media in innovation and, identify future research opportunities in the discourse.

Descriptive rather than statistical analyses of results have been presented. Qualitative techniques of pattern matching and explanation building (Yin, 2015) have been adopted to descriptively categorise the journal articles by theories, innovation type, social media type, methodology, and other thematic categories. In this regard, pattern matching refers to scanning for commonalities and disparities in which 'even an "eyeballing" technique is sufficiently convincing to draw a conclusion' (Yin, 1994, p. 110).

2.1. Review topic and research questions

To capture the diversity of social media uses in innovation and its management, this study uses a predefined selection criteria inspired by principles and guidelines outlined in previous approaches adopted by scholars in systematic literature reviews (see Crossan and Apaydin, 2010; Iden et al., 2017; Lu et al., 2018). For instance, we use Iden et al.'s (2017) conceptual and empirical categorisation along with their approach to developing research questions and presentation of results. Following such precedence, this systematic literature review offers a revealing stand-alone evaluation of purposefully considered literature related to social media and innovation. Specifically, the aim of this study is to address the following research questions:

RQ1. What are the dominant social media paradigms currently used in innovation research?

RQ2. How have the current trends influenced the conceptualisation of social media in innovation?

RQ3. What are the promising avenues for the future development of research on social media in innovation?

2.2. The search process

Tranfield et al.'s (2003) three-stage procedure - planning, execution, and reporting guided this research. Research objectives and key database sources were identified during the planning stage. To support the research aim, objectives were set to allow for broad scan of articles: to assess the range of paradigms, definitions and operationalisation in conjunction with theoretical and methodological similarities and disparities. To concentrate on sources that are likely to provide highest level of impact in the innovation management discipline, search of articles was limited to peer-reviewed journals (Podsakoff et al., 2005). The initial list of articles was generated by computerised-database keyword searches on EBSCO Host® followed by a secondary search on Scopus® database. This allowed for a broader search covering a wide range of disciplines with indexed content from more than 20,000 journals. EBSCO Host® was chosen as the primary database as it simultaneously searches articles on databases such as Emerald®, the Sage®, Blackwell® and Science Direct®, thus demonstrating its scope and potential for a systematic review and meta-analysis study. Scopus® is the largest abstract and citation database of peer-reviewed literature. Scopus features smart tools to track, analyse and visualise research. As research at the intersection of social media and innovation is situated globally and crosses disciplinary boundaries, multiple databases are used to make sure that critical research from around the world is not missed. While an increasing trend in analytical literature reviews has been to utilise Web of Science (WoS) database, Scopus is still the most comprehensive database with indexed content from more than 20,000 journals. Previous comparisons of databases have also conformed to the strength of Scopus over other databases. For instance, Falagas et al. (2008) found that Scopus offered nearly 20% more coverage in citation analysis than it biggest competitor WoS, a result similar to that of Gavel and Iselid (2008). They found a significant overlap of articles in Scopus of those found in WoS, and this number for significantly lower for articles found in WoS and not in Scopus. More recently, Mongeon and Paul-Hus (2016) conducted a systematic comparative analysis of Scopus and WoS databases. They found that Scopus indexed 20,346 active journals in comparison to 13,605 in Web of Science. Their analysis revealed that 'Scopus includes most of the journals indexed in WoS. Furthermore, Scopus has a larger number of exclusive journals than WoS in all fields' (p. 219). Furthermore, the searches across both databases did not limit the date of publication, allowing for all available years of publication date to be included in the scope of the -review.

2.3. Identifying initial selection criteria: Keywords and search terms

The objective of this paper is to capture research themes and

paradigms from social media in innovation literature - the scope of the study. Hence a combination of terms related to both areas (i.e. social media AND innovation) were used to identify the peer-reviewed journal articles. Peer-reviewed journal articles were manually selected for inclusion with books, reports, editorials and other non-peer reviewed publications explicitly excluded, as journals are preferred sources of knowledge with higher reliability (Donohue and Fox, 2000). Due to the linguistic limitations of the authors, articles were only considered if they were available in English language. Likewise, to allow for appropriate review and analysis, articles were considered only if full text was available from the database.

In searching for relevant primary studies, we used key words. It was assumed that researchers could use the term 'innovation' in various ways given the range of meanings associated with the term, hence a broad search criteria was suitably applied, albeit restricted to search of keywords within the 'abstract'. In order to exclude or include articles, similar terms were considered in the composition of the keywords such as "social media" and "crowdsourcing". The decision to extend the search and include crowdsourcing was considered due to: (1) observed trends in the discourse suggesting research in innovation considered social media and crowdsourcing concurrently; (2) crowdsourcing for innovation intrinsically relies on "reaching out to the crowds" using technology-enabled platforms based on social media functionalities. Thus, the search string agreed by the authors used "social media" and "crowdsourcing" to guarantee inclusion of articles, which relate to innovation using crowdsourcing but may not explicitly refer to social media. Similarly, as new product and new service development literature streams also relate to innovation processes (see Bashir et al., 2017); those terms were added to the search. Likewise, "social network sites" is a term occasionally used in consumer marketing and engineering discipline rather than social media or crowdsourcing (see Roberts and Candi, 2014). The final search string and inclusion-exclusion criteria are summarized below:

- Keyword {innovation *OR* "new product development" OR "new service development"}
- **AND** {"social media" *OR* crowdsourcing *OR* "social network# site#"}
- Search in: 'Abstract'
- Document type: 'Journal article' AND 'Peer-reviewed'
- Language: 'English'
- Filter: Full text available

The inclusion criteria were:

- for duplicate studies across two databases, one was selected from EBSCO Host®;
- for articles reporting identical studies, the most recent one was selected;
- for articles describing more than one study each study was individually evaluated;
- the articles had to describe adoption or use of social media (or crowdsourcing) in innovation and/or its management (i.e. innovation process or outcome);
- the articles had to discuss at least one of the types of innovation;
- the articles had to discuss at least one of the types of social media.

The exclusion criteria were:

- full-text not available within the selected database;
- article that was not written in English;
- article or review published in a book;
- articles not referring to social media or crowdsourcing in innovation and/or its management;
- articles referring to social media without a focus on type of innovation (see Table 2)

- articles referring to innovation without a focus on type of social media (see Table 2) or crowdsourcing;
- reports, letters, technical summaries or reviews of editorial nature (i.e. items lacking methodological rigour of scientific research) (Donohue and Fox, 2000).

2.4. Compiling the final included body of knowledge

The final included body of knowledge for this study has been saved in the reference management software Endnote (version 7.7.1), in order to facilitate organisation and retrieval. The final keyword search resulted in 1099 articles in EBSCO Host® and 1270 in Scopus®. Limiting the search to peer-reviewed journal articles published in English with full-text being available resulted in a total of 189 articles in EBSCO Host® and 506 articles in Scopus®. This initial set was then fixed as the basis for review for all future analysis, subject to inclusion-exclusion criteria.

Firstly, all derived items were "eye-balled" for consistency and accuracy of the keyword search (i.e. titles, full-text availability, English language and peer-reviewed journal articles). In this stage, 175 articles were selected out of 189 from EBSCO Host®. Similar approach on Scopus® included an additional check for duplicates already selected in EBSCO Host®, resulting in a selection of 215 articles in Scopus®. Secondly, one of the authors read the abstracts of all selected articles from stage 1. This step resulted in a selection of 96 articles in EBSCO Host® and 65 articles in Scopus®. In the third stage, all selected articles from stage 2 were read in full, particularly assessing for innovation and social media paradigms, types of innovation discussed, types of social media discussed, theoretical underpinning, type of innovation impact, unit of analysis and methodology. This resulted in a final selection of 72 articles in EBSCO Host® and 49 articles in Scopus®, revealing the final included body of knowledge comprising of 111 articles.

2.5. Categorisation of final included body of knowledge

The adopted categorisation strategy in this study resembles principles applied in content analysis, where a form is created to record the data and a coding manual is used to support the specifications of the coding (Bryman and Bell, 2015). The focus of categorisation extended beyond basic bibliographic information (i.e. year, author, journal, etc.) and specifically identified five other aspects: innovation-social media/crowdsourcing paradigm, elements of innovation, elements of social media, elements related to social media in innovation and methodology. A worksheet facilitated the otherwise manual selection/de-selection process at the execution stage (Tranfield et al., 2003). All three authors agreed on limiting the categories to the list depicted in Appendix 2, allowing for systematic review of the articles that would specifically help respond to our research questions on adoption and use of social media in innovation process and outcome. While some elements of the analysis are deductive (e.g. categorising according to the social media and crowdsourcing), others are more inductive (e.g. paradigms). Specifically, the intentional decision not to pre-determine a list of theories or methods in the planning stage, allowed for broader scope, with various theoretical underpinnings and methodological approaches emerging during the execution stage. A full summative list of the final included body of knowledge could be made available up on request.

2.6. Grouping the final included body of knowledge set

Given the research aim to systematically identifying the breadth of literature associating social media or crowdsourcing with innovation and its management, the initial pool of articles were broadly grouped according to their contribution to research - empirical, conceptual and literature review (Group 1). One conference review paper submitted to 6th GIKA conference was included as an exception to the selection rule

due to its clear message for future directions on social media paradigms in marketing innovation. An article was considered conceptual if related to formulation of concepts, frameworks or models, distinct from empirical articles that applied methodological techniques to explore, examine or investigate and report the observations of a phenomenon (Orlikowski and Baroudi, 1991).

The second group (Group 2) in this study was obtained by applying secondary keyword selection criteria and inclusion-exclusion criteria to the primary pool. After checking of overlaps and duplications, the reading of abstracts revealed, 86 articles that explicitly discussed social media and 26 articles that discussed crowdsourcing in innovation. The relationship between social media and crowdsourcing platforms is blurred in literature. On the one hand, crowdsourcing platforms have been acknowledged as knowledge management tools (Schlagwein and Bjørn-Andersen, 2014) that invite suggestions from external contributors (Piezunka and Dahlander, 2015) allowing generation of solutions for well-defined problems (Malhotra and Majchrzak, 2014) – a paradigm consistent with social media's use in innovation processes (Palacios-Marqués et al., 2015; Roberts et al., 2016). On the other hand, crowdsourcing platforms have been limited in their association to various types of innovation, confining mostly to open innovation paradigm (Lampel et al., 2012; Mladenow et al., 2014) – a view inconsistent with the versatility of social media in innovation and its management (Lin et al., 2017; Nascimento and da Silveira, 2017). The purpose of crowdsourcing platforms in open innovation process usually related to provision of customer service through online communities, to build engagement with customers through games and contests, and acquire consumer ideas through crowdsourcing (Guinan et al., 2014). The two groups (Group 1 and Group 2) were deliberately formed to be mutually exclusive and the final included body of knowledge was categorised firstly according to Group 1, followed by second order categorisation in Group 2. This meant an article could be identified according to social media or crowdsourcing platform within the type of research contribution.

3. Findings and discussion

In this section, descriptive statistics are presented and then each research question has been addressed. Where appropriate, reference numbers of papers are provided, as listed in Appendix 1.

3.1. General trends in literature

This section presents the emerging trends in literature on social media in innovation.

3.1.1. Emergence of social media aspects in innovation literature

There has been a clear emergence of research on role of social media in innovation and its management since 2012, with a steep increase since 2013 (see Fig. 1). The surge in social media related articles
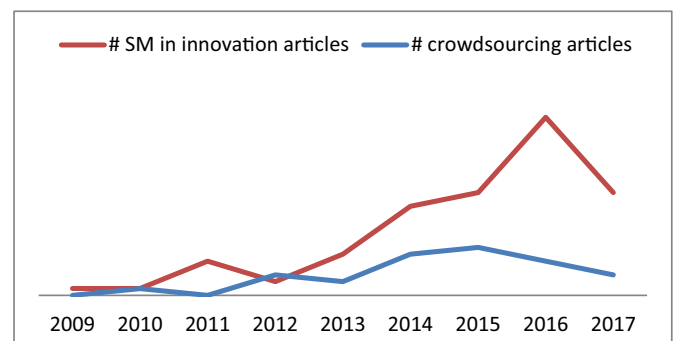

Fig. 1. *Social media v. Crowdsourcing article trends by year.*

corresponds to a gradual decline in the articles addressing crowdsourcing platforms without explicitly considering the role of social media. This suggests a shift in acceptance (at least within the research community) of the wider role of Web 2.0 technologies such as social media in managing innovation activities (Palacios-Marqués et al., 2015; Scuotto et al., 2017a; Wikström and Ellonen, 2012). Note, that the depicted decline in 2017 is a reflection of the limitations of the study (i.e. final included body of knowledge was compiled in mid-2017), rather than a change in research trend.

Despite searching for articles without a restriction on year of publication, the first articles on social media were published in 2009. The year 2009 bears no particular significance according to the authors, but from a social media timeline perspective, comes 6 years after the launch of LinkedIn, 5 years after Facebook, 3 years after Twitter and IBM InnovationJam ™ and 2 years after Dell IdeaStorm ™ was launched. In total across social media in innovation and crowdsourcing, 13 articles were published between 2009 and 2012 and 99 articles between 2013 and 2017. The strong positive trend since 2013 on role of social media in innovation management confirms that the interest in the discourse has grown in recent years.

3.1.2. Prominent publications and authors in the discourse

In searching for a rationale behind the surge of social media in innovation articles, two possibilities were considered: (1) prolific author/s advancing the knowledge in the discourse and (2) special issue on the topic in a peer-reviewed journal. Exploration into the possibilities revealed that no journals had a significant spike in the number of articles published on social media or crowdsourcing in innovation. However, the systematic review of literature revealed some concentration of articles by author. Table 1 shows the list of authors with two or more published articles in the discourse, a qualitative description of the central message found in their respective studies and a list of publications with at least three articles on the topic.
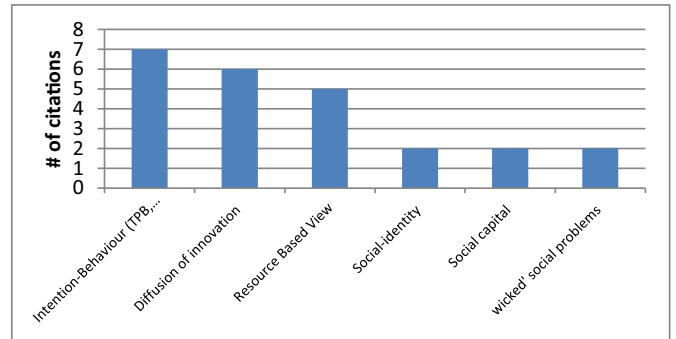

Fig. 2. Most popular theoretical perspectives.
Note: Some articles combine more than one theory and all perspectives are captured here.

3.1.3. Stocktake of extant level of research contribution

Not surprisingly, the recent focus on the discourse is consistent with the finding that the majority of articles (96 articles) can be classified as "empirical". The final included body of knowledge included, 9 articles presented as "literature review", 5 as "conceptual" and 1 conference review article. An observation is made of gradual and steady increase in the number of empirical studies in the discourse since 2013.

3.1.3.1. Most popular theoretical and methodological perspectives on social media in innovation. Overall, of the empirical articles, 56 were presented with clear theoretical underpinning and 46 could be described as a-theoretical. Notably, the trend of theoretical articles is consistently less than the total number of published articles year on year. Fig. 2 shows the most popular theoretical perspectives used by researchers in understanding social media in innovation. The articles that can be categorised as theoretical tend to import constructs from

Table 1
Top authors (with two or more publications).

Author	Description of central message of the article	Articles
Bugshan, Hatem	Social media empowers – is a driver of online participation and free expression and is a cost-efficient enabler for open innovation in NPD process	15
	Social media enabled online communities allows interconnectivity which, produces social capital and enables co-innovation	33
Roberts, Deborah & **Piller**, Frank	Social media can provide rewards to companies but, strategies must be considered with care and intelligence	16
Roberts, Deborah; **Piller**, Frank & Lüttgens, Dirk	Utilising information from social media can be beneficial for new product development and lead to competitive advantage	14
Roberts, Deborah & **Candi**, Marina	Businesses should be diligent in adopting social media strategies and acknowledge that social media presence in itself does not guarantee success	99
Androutsopoulou, Aggeliki; **Charalabidis**, Yannis & **Loukis**, Euridis	Social innovation characteristics determine degree of social media adoption	32
	Social media monitoring can help sense the environment and act as enabler of two-way engagement in government policy	6
von Briel, Frederik	Enterprise social media can be an enabler for innovation but success from its use rests on establishment of social culture and readiness of employees.	75
	Semantic analysis of customer posts on social media can enable idea creation	76
Simula, Henri	Network perspective on innovation crowdsourcing can be categorised – internal crowdsourcing, open crowdsourcing, community crowdsourcing and crowdsourcing via a broker	85
	Social media can enable innovation but how much information a company should provide its customers in innovation process remains debatable	43

Top publications

Publication	Number of articles	Articles
Journal of Product Innovation Management	6	9, 14, 34, 49, 99, 109
Government Information Quarterly	3	5, 6, 8
Industrial Marketing Management	3	23, 30, 85
International Journal of Information Management	3	1, 13, 92
International Journal of Innovation Management	3	22, 37, 87
IT Professional	3	75, 76, 81
Research-Technology Management	3	55, 63, 65
Technological Forecasting and Social Change	3	72, 80, 103

other fields, rather than develop their own. Amundson (1998) identifies these theoretical lenses as alien perspectives, which allow researchers to observe and evaluate a phenomenon or data. It is found that most articles use the theoretical perspective to describe the nature of social media in innovation activities rather than extend upon these theories. Even in case studies, which provide insights into literal and theoretical aspects from a holistic stance (Yin, 2015), the authors in most of the articles present findings and conclude with little or no extension to theory. It is worth mentioning that some researchers used multiple theories in a single article and some used a single theory with multiple lenses.

An observation is made that while 33 different theories were found in final included body of knowledge of articles, they remain concentrated towards behavioural theories. Most of the theories in current social media in innovation literature are borrowed from socio-cognitive psychology such as intention-behaviour perspectives (including Theory of Planned Behaviour, Theory of Reasoned Action and Technology Acceptance Model), social identity theory, social capital theory, social comparison theory, social exchange theory and social learning theory. The prominent strategic management theory is Barney's (1991) resource based view of the firm with researchers' emphasising the need for firms to exploit tangible and intangible resources to gain competitive advantage, an ability to convert Web 2.0 technologies to specific capabilities. One article (see Mergel, 2015) extends this resource-based-view based on Peteraf's (1993) perspective of systematically coordinating internal capabilities to enhance competitive advantage. In this frame, Mergel (2015) posited that to create specific innovation management capabilities increasing managerial coordination is required, leveraging social media to design each phase of the open innovation process and guide the crowd to provide expected solutions to public management problems. Two other articles incorporated the logic of dynamic capability and distinctive competences. Despite the convenience of importing and applying a broad range of theoretical perspectives in understanding social media in innovation, challenges and limitations exist which need to be understood to advance knowledge in the discourse. Authors need to carefully select theories that are compatible to the phenomenon under investigation, relevant to the concept and have sufficient explanatory power (Amundson, 1998). Theories imported from other disciplines tend to carry limitations of their mother discipline, hence when such theories are applied to understand social media in innovation they may explain or predict some relationships at the expense of others. It may be appropriate for researchers to rely on a multi-disciplinary approach, revealing multi-level and multi-faceted insights into the use of social media in innovation.

Such insights require theoretical perspectives suiting multiple levels of analysis. Theories used to explain social media in innovation can be described as micro theories (i.e. individual or behavioural) or macro theories (i.e. organisational or strategic). While, macro and micro perspectives have been studied, authors have limited the scope of studies to either macro or micro-level, in contrast to adopting a holistic perspective. This divide between micro and macro perspectives is not unusual in explaining and predicting a strategic phenomenon. Theoretical as well as methodological difficulties in capturing both macro and micro perspectives in a single study have been acknowledged by many authors (Astley and Van de Ven, 1983; Klein et al., 1999). Furthermore, the lack of focus on understanding a phenomenon from macro and micro-level may be related to the fact that the discourse is still in its infancy. Accordingly, both exploratory and explanatory research, adopting a holistic view of social media use in innovation remains providential.

Exploratory methods are appropriate where the research questions are mostly 'why' or 'how' something happens (Yin, 2015) and an explanatory method is suited where confirmation of the phenomenon is the objective (Yin, 2015). The early stage of knowledge building in the discourse is consistent with the observation that majority of the empirical articles included qualitative methods (52 articles). Qualitative exploration techniques include data collection methods such as semi-structured interviews, document review, focus group discussions and expert interviews and often use pattern-matching, thematic analysis or theoretical analysis techniques to evaluate the findings (Yin, 2015). Accordingly, 33 articles in the final included body of knowledge presented findings based on thematic analysis of observations - the most popular analysis technique adopted by authors. In total, 36 articles included quantitative methods with regression analysis techniques (11 articles) and structural equation modelling (SEM) (10 articles) being the most popular statistical analysis method adopted for evaluation of observations collected using survey questionnaires - a systematic and structured way of data collection (Saunders et al., 2009). Mixed methods were presented in 8 articles which adopted a combination of qualitative and quantitative analysis techniques.

3.1.3.2. Focus of the studies by region. An emerging feature found in the analysis is that the geographical region of the sample frame in majority of articles (33 articles) included European nations. Studies including participants from the United States of America represented 21% (or 24 articles). Aside from studies reporting on observations from a global sample frame (8% or 7 articles) and those not specifying the region or are non-empirical (26% or 28 articles), the first record of single region study in Asia can be found in a 2014 article published in *Public Management Review*. Studies with observations in Asia represent 8% (or 9 articles), with those in China representing 4% (or 5 articles).

3.2. What are the dominant social media paradigms currently used in the field of innovation management?

Within the technological developments of this era, social media are considered as the tools that allow exchange of information and knowledge creation between people and entities, especially when knowledge is dispersed among different stakeholders (Scuotto et al., 2017b). The use of social media to connect and interact within and outside the firm has been the key driver of innovation performance, allowing firms to collaborate easily and at lower costs with large and diverse groups (Mount and Martinez, 2014; Steiger et al., 2012). Equally, social media has enabled value creation from organisational competences for innovation through enhanced business intelligence and knowledge management (Palacios-Marqués et al., 2015). At this juncture, it is important to describe the two terms, *drivers* and *enablers* before unveiling them as paradigms found in literature (see Tsikriktsis et al., 2004 for a driver-enabler analogy). A *driver* is an initiating instrument that stimulates the firm to engage in a process whereas an *enabler* is an instrument that facilitates the implementation of activities in the development of that process. Thus, while presence of enabler is necessary in fulfilment of the innovation strategy, it is insufficient by itself. As firms acquire new knowledge and face new challenges such as those related to innovation management, there emerges repetition of operating cycles involving first the *driver* initiating change, then the *enabler* nurturing incremental advancements towards competitive advantage. In this regard, social media allows firms to capture and create new forms of knowledge by involving internal stakeholders (e.g. employees) and external stakeholders (e.g. customers and users) at various stages of the innovation process (Piller et al., 2012). Effective utilisation and sharing of capabilities between stakeholders, as posited by more recent thoughts (Priem et al., 2012) on resource based view of the firm (Barney, 1991) can be seen as a competitive advantage that enhances the formulation, digression and implementation of innovation practices, within the firm and across stakeholder groups. Social media augments inclusions of large number of heterogeneous participants in the firm's innovation process (Ferraris et al., 2017). Accordingly, it be argued that the motivation for adoption and use of social media (or crowdsourcing), arising from both internal stakeholders (e.g. top management team and employees) and external stakeholders (e.g. customers, suppliers, retailers and associations), could *drive* the

innovation activity. Additionally, the development of an innovation process and derivation of an effective innovation outcome is reliant on the synergy of resources (tangible and intangible) of the firm (Barney, 1991), together with the design of an effective knowledge sharing, free expression and engagement platform (Marion et al., 2014) that promotes global coordination and connectedness between stakeholders. In this regard, social media (and crowdsourcing) can be termed as the *enabler* of innovation and its management. Both, social media (and crowdsourcing), as driver and enabler, can help firms manage various stages of innovation (Nascimento and da Silveira, 2017).

Stieglitz et al. (2014) explained social media as 'a kind of living lab, which enables academics to collect large amounts of data generated in a real-world environment' (p. 90). Patrick and Dotsika (2007) conceptualised social software as a 'set of online tools that *enable* the aggregation and remixing of content' (p. 399). Likewise, Lopez-Nicolas and Soto-Acosta (2010) posited that use of ICTs such as social media *enable* knowledge creation processes. In the same vein, Palacios-Marqués et al. (2015) concluded that online social networks are *enablers* of innovation in organisations, in that they 'enable managers to identify the social networks related to their business and to communicate and interact with key audiences' there in affording the 'capacity to assist in the management of knowledge' (p. 1915). According to Laurell and Sandström (2016) social media can facilitate innovation activities in practice and hence they posit that research on interplay between social media technology and organisational change remains providential. Ooms et al. (2015) identify social media as tools that allow organisations to scan the environment in the quest to improve absorptive capacity for innovation. Accordingly, Wang et al. (2016) considered social media as enabler of co-innovation activities and predicted its influence in brand awareness as well as market development. These views are consistent with Dong and Wu (2015) who explain social media technologies as enablers of crowdsourcing and open innovation, allowing organisation to seize strategic opportunities through dynamic reconfiguration of business units based on user-generated content. In building a rationale between crowdsourcing and use of online social networks, Xu, Ribeiro-Soriano and Gonzalez (2015) explain that online social networks broaden the innovation capacity of firms in that the strategic utilisation of interactions could provide deeper understanding of preferences and behaviours among users of such platforms. The social media as *enabler* paradigm has significant representation in current innovation management literature and several scholars have identified the enabling role of social media in managing knowledge flows across internal (Brzozowski, 2009; Inkinen et al., 2015; Scuotto et al., 2017a) and external stakeholders (Adams, 2014; Callaghan, 2016; Filieri, 2013; Hitchen et al., 2017).

While, many of the articles in the final included body of knowledge captured both *driver* and *enabler* aspects of social media, some clearly identified it as one or the other. This finding led to the search for articles where social media is considered as a *driver* of innovation activities. Martini et al. (2013) conceptualised social media as a driver of innovation process 'systematically involving users' to 'do what traditional advertising does: persuade consumers to buy a company's product or service' (p. 199). Their theoretical approach described social media *for* innovation as 'an emergent process in which human and material agencies are inextricably intertwined' (p. 199). This is an important notion since social media as *driver* of innovation activities tend to promote adoption-behaviour (see Ajzen (2002) for antecedents of intention-behaviour), by allowing for socialisation resulting in a shift in value proposition of the firm (Wikström and Ellonen, 2012). The detail reading of the final included body of knowledge of articles found that the social media as *driver* paradigm is present, albeit implicitly, in most articles. Table 2 identifies some of the current definitions and paradigms, which resonate with social media as *enabler* and *driver* of innovation.

3.3. How have the current trends influenced the conceptualisation of social media in innovation?

Broadly, we find that studies at the intersection of social media and innovation depart from view of social media as just another computer-mediated communication technology, rather they acknowledge social media as new form of technologies shaping the pace, intensity and inclusiveness of firm's innovation efforts. We identify at least two affordances – social media *for* innovation and social media *in* innovation. The former refers to the use of social media functionalities to *drive* search and consistency during the innovation process (i.e. the *what for* aspect) and the later refers to the practices *enabling* the relationship between firm's innovation context and the social media functionalities (i.e. the *how* aspect). We believe this broad driver-enabler approach distinguished in the conceptualisation of social media *for* innovation and social media *in* innovation offers at least three advantages. First, it reduces the specific feature-focused deterministic view of social media in organisational processes. Second, the distinction draws attention towards social media as an organisational capability in parallel to its privileged view as a computer-mediated communication technology. Third, focusing on the driver-enabler distinction rather than its feature-focused social uses promotes development of alternate socio-dynamic theories, as distinct from traditional technology-acceptance and adoption theories. Collectively, our conceptualisation of social media *in* innovation and social media *for* innovation offers an opportunity to remain feature-agnostic and draw attention towards the interactions and relationships of social media and innovation, focusing on communicative actions and outcome across the innovation communities.

3.3.1. Social media for innovation

Social media have altered the way organisations interact with their external and internal environment (Kaplan and Haenlein, 2010). These new technologies have introduced substantial changes to the way communication takes place between organisations, individuals, and the community at large (Papagiannidis and Bourlakis, 2015). Social media tools include not only mainstream social networking websites such as Facebook or Twitter, but also applications that permit fast and/or short multi-directional interactions (e.g. RSS) and exchanges of information (e.g. blogs and wikis). These new tools are based on participation, creativity and high levels of interaction between users, and are characterized by low barriers of entry and user-friendly interfaces based on web-based applications. Thus, social media appears as an effective way of promoting interactions, connecting heterogeneous actors who operate in different social spheres and bringing them together to foster innovation (Lin et al., 2017; Ooms et al., 2015).

There appears to be two main strategies of social media use for innovation among today's organisations. At a basic level, some innovative companies use social media to source ideas for improving existing products or services and to develop new ones. These organisations actively listen to external social media networks as a source of ideas and recommendations and may even participate in online conversations in order to become an active part of the community, like Dell, Del Monte, and Nokia Corporation did (Nambisan and Nambisan, 2008). At an advanced level, some organisations have adapted existing social media platforms for extended internal use, such as using Facebook groups for official internal/external interaction or have even built their own internal social media networks with external capabilities. For instance, IBM's "Innovation Jam" project allows the company to crowdsource ideas for new products and troubleshooting from its collaborators and partners (Bjelland and Wood, 2008). Several classifications and typologies of Social Media exist in the literature. One of most cited is certainly Kaplan and Haenlein's (2010) classification that draw on the concepts of social presence, media richness, self-presentation, and self-disclosure. Kietzmann et al. (2011) who attempted to integrate the technical and social dimensions of social media, and by doing so, identified seven functional building blocks of social media related to

Table 2
Social media paradigms: enabler and driver.

A short list of articles adopting social media as *enabler* paradigm

Reference	Article	Description of adopted social media paradigm
Lin, Li & Wang (2017)	13	Social media is the platform where social commerce activities occur, focused on information sharing and increasing competitive advantage
Nguyen et al. (2015)	30	Social media as a platform for knowledge sharing represents strategic capability of a firm in innovation activities
Marion, Barczak & Hultink (2014)	34	Social media tools enable increased communication and knowledge flow, both from inside and outside the corporation
Simula, Tollinen & Karjaluoto (2013)	43	Social media represents platforms and tools of digital marketing that enable social interaction between business and customer networks
Peña (2012)	54	Social media enables innovation by seeking information from diverse group of individuals – in varied virtual social formats

A short list of articles adopting social media as *driver* paradigm

Reference	Article	Description of adopted social media paradigm
Pan et al. (2017)	29	Social media promotes varied use through focus on relational (social-self) identity of users, driving social interaction and communication necessary for innovation activities
Yadav, Kamboj & Rahman (2016)	77	Driving co-creation through social media is useful in practice as it positively influences management evaluation of innovation activities
DeNardis & Hackl (2015)	41	Social media platforms drive innovation activities by providing affordances for intermediation, interactivity and the ability for an individual to articulate network connections with other users
Gibbs et al. (2015)	57	Enterprise social media tools drives organisational innovation by promoting cross-boundary communication – where users gain access to new people and knowledge
Charalabidis, Loukis & Androutsopoulou (2014)	32	Social media is a social collaboration tool which drives user interaction where the intention is to share the information with other users

identity, conversations, sharing, presence, relationships, reputation, and groups.

3.3.2. Social media in innovation

The literature on social media in innovation typically refers to product innovation (Ghezzi et al., 2016), process innovation (Harris et al., 2013), organisational innovation (Patroni et al., 2016), marketing innovation (Wu, 2016), technical innovation (Mount and Martinez, 2014), service innovation (Palacios-Marqués et al., 2015) and open innovation (Piezunka and Dahlander, 2015). Uses of social media in innovation could include two-way engagement for ideas building, setting up forums for communications, information broadcasting, trend spotting, collaborating and motivating participation in innovation activities (Turban et al., 2011). Through these practices, the purpose is to collect and analyse information, feedback and content from the various possible stakeholders that compose the social media innovation ecosystem. The choice of specific interaction and communication modes determine the targeted depth of the search activities to acquire relevant inputs while the range of targeted stakeholders will determinates its breadth (Laursen & Salter, 2006). It is thus reasonable to expect that organisational units for various types of innovation will use the four types of social media differently.

Indeed, innovation is a widely reviewed topic with varying acceptable definitions for the term (Baregheh et al., 2009). The innovation lifecycle stages comparatively resemble the service or product lifecycle stages – extending from 'conceptualization of innovation, its generation, and adoption by few experienced users to its potential diffusion within the organisation and finally the analysis of its impact and the resultant changes in the firm' (Jha and Bose, 2016, p. 298). Thus, the strategic analysis of a differentiated, complementary social media use in innovation should include the different types of social media used, the stakeholders targeted, the nature of the interaction envisaged (i.e., unilateral or bilateral), the different stages of innovation process and the type of pursued innovation. These elements are essential to investigate whether the externally and/or internally oriented exchanges via social media solutions lead to better innovation outcomes and, hence guide the synthesis of findings in this systematic review of literature in the discourse.

3.3.3. Current social media types found in literature

The purpose of this paper is not to review the social media typologies extensively. Nevertheless, the systematic review of the literature identified four main possible types of social media used by organisations for innovation activities. The first category *Public social media* (*Public SM* henceforth) includes platforms such as Facebook, Twitter, YouTube, LinkedIn, etc. that offer social technologies used by organisations to generate communication with external customers or consumers and to create spaces for product and company discussions (Guinan et al., 2014). Such connections may be used to leverage customer and user feedback for product experience and refinement, as well as idea contests. The second category of *Company-built social media* (*Company-built SM* henceforth) relates to platforms based on social networking functionalities developed in-house by organisations. They are used to leverage interactions internally (e.g. NASA@work) or gauge perceptions of users externally (e.g. IBM JAM, Dell IdeaStorm, etc.). The purpose in this case is usually to provide customer service through online communities, to build engagement with stakeholders through games and contests, and acquire stakeholder ideas through crowdsourcing (Guinan et al., 2014). The third category *Company-licenced social media* (*Company-licenced SM* henceforth) gathers proprietary solutions developed by a service provider company that are used usually internally as an enterprise social networking platform (e.g. IdeasProject, MS 365 Yammer, etc.). The use of these solutions enable internal employees to communicate and collaborate on work projects, to locate subject-matter experts, and to capture and share unstructured content (e.g., blogs, video) in addition to documents for curation (Guinan et al., 2014). Finally, the last category *Innovation intermediary social media* (*Innovation intermediary SM* henceforth) represents the recourse for organisations to specialised innovation intermediaries such as Innocentive, Get Satisfaction, etc. in order to create innovation tailor-made services such as internal or external ideation contests (King and Lakhani, 2013). This typology summarizes the different uses of social media for innovation by organisations.

An observation is made that majority of articles investigated *Public SM*, with most among them implying that the use of Public SM is privileged for generating customer insights (Roberts et al., 2016). Accordingly, although the systematic review of literature identified a large array of social media platforms investigated for their role in innovation,

Facebook (23 articles), Twitter (18 articles) and YouTube (9 articles) were the most popular, followed by LinkedIn (7 articles), online blogs (6 articles) and Chinese *Public SM* platforms WeChat and Weibo (4 articles). Overall, 60 articles investigated *Public SM*, 18 articles investigated *Company-built SM*, 10 articles investigated *Innovation intermediaries SM* and 4 articles investigated *Company-licenced SM*, with remaining 4 of the empirical articles investigating more than one type of social media in innovation. Although limited in empirical findings, literature highlights some success stories about the use of one or the other type of social media for innovation, suggesting exponential benefits if they are used complementarily.

3.3.4. Social media and innovation type

The boundaries between innovation types are blurring, as novelties are increasingly offered in bundles of products and services (Chesbrough, 2006). Additionally, new offerings can also be delivered through new channels, or via new business models, hence combining product, service and business models innovation. Thus, a reasonable expectation of the utility of social media in innovation management stems from the proposition that social media tools can reduce uncertainty (Franklin et al., 2013; Nguyen et al., 2015), promote collaboration through knowledge sharing (Schirr, 2013) and support different innovation types (Patroni et al., 2016). Fig. 3 shows the distribution of articles in the final included body of knowledge across various types of innovation. Notably, open innovation, service innovation, organisational innovation, product innovation and marketing innovation are the most popular types of innovations investigated for their interactions with social media.

3.3.5. Social media characteristics in innovation management

The perceived benefits of social media adoption are grounded in their capacity to expand horizons in terms of new ideas, as well as the circulation of those ideas within organisations. Social media are expected to generate economic gains, enable cost savings and risk mitigation in the innovation process. A recent study from Halale et al. (2015) shows that when social media tools are used in the right way, organisations can achieve various benefits, including increasing interactivity with customers, reaching new (customer) segments, generating ideas for product innovation, and gaining insight into customer behaviours and trends. The authors detail characteristics of social media that can support value co-creation in business innovation in the following ways: (i) Participation in promoting conversation among customers and employees; (ii) Openness in giving users a platform for free expression on various issues in the organisation by sharing information or views; (iii) Conversation in engaging customers in designing products or services that let the organisation get better ideas, via two-way open conversations; (iv) Connectedness in benefiting the organisation through

connectivity, using links to other sites, resources, and people; and (v) Community through allowing for the creation of various communities for effective communication, encouraging creative collaboration among teams, and inviting customer ideas, feedback, and suggestions on how the organisation can offer new and better value (Halale et al., 2015).

Company-Built SM and *Company-licenced SM* are popular for building communities and two-way engagement for innovation ideation, while innovation intermediaries are popular choices as platforms for developing a sense of 'connectedness'. *Public SM* has been considered across all five social media characteristics in innovation management, with popular ones being free expression of thoughts, promoting conversations and two-way engagement. Overall, 50 articles had organised discussions around social media's characteristic to allow engagement and two-way idea building conversations, with 21 articles identifying openness and free expression characteristic. The characteristic of participation and promoting conversation was discussed in 15 articles and 11 other articles discussed social media's characteristic of allowing for 'connectedness' or connection to outside company resources. A further 9 articles identified building communities of practice or communities in general as social media's characteristic in innovation management, with 5 articles not specifying a particular stance. Despite this potential for innovation, many organisations do not yet have a specific or adequate approach to the challenges and opportunities offered by social media (Roberts et al., 2016). If social media offers potential for innovation, an understanding of the difficulties, obstacles and enablers associated to the successful use of SM for innovation is necessary.

3.3.6. Barriers in adopting social media in innovation management

The typology of barriers or challenges adopted in this study has been drawn from the works of Mergel and Bretschneider (2013) who have investigated this issue in the case of public organisations as well as Linke and Zerfass (2013) and Turban et al. (2011) who have investigated risks of social media in the case of private enterprises. The elements that compose this typology are of course analytically separated here but are empirically entangled. For the purpose of qualitative analysis, the process approach adopted by Mergel and Bretschneider (2013) may be relevant depending the development stage of the social media use in innovation management. These authors distinguish three distinct stages (respectively intrapreneurship and experimentation, order from chaos and institutionalization) within which different obstacles and challenges may occur and adequate support activities for social media adoption and implementation may be developed.

Given the earlier finding that most studies have adopted behavioural theories to explain and predict the use of social media in innovation, it is not surprising that most articles have reported behavioural or organisational culture barriers (59 articles), with 32 articles reporting organisational strategy as the barrier affecting adopting of
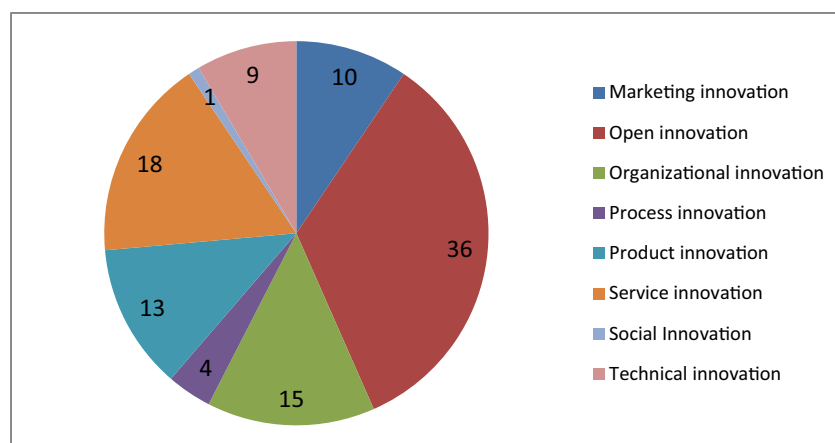

Fig. 3. Articles by innovation type.

Table 3
Popular type of social media and observed participants at various stages of innovation.

Stage of innovation	Commonly found social media type	Participating stakeholders
Conceptualisation/market analysis	Company-built SM Innovation intermediaries SM Public SM	Users/customers
Generation/development	All 4 types	Employees Social community Users/customers Business community
Adoption/launch	Public SM	Employees Social community
Diffusion/promotion	Company-built SM Public SM	Users/customers Social community
Impact	Public SM	TMT Users/customers

social media in innovation. A further 8 articles discussed technical barriers and 7 articles discussed intellectual property rights or privacy concerns as the barriers to social media use in innovation. Notably, no article clearly discussed IT or security concerns as the challenge or barrier to overcome in adoption of social media for innovation purposes.

3.4. Under-explored aspects of social media in innovation

Overall, the predominant theoretical perspectives used in current literature fail to capture the versatility of social media in innovation and its management (see Table 3).

However, relying on our typology (described earlier), to understand which of these types of social media are used at what specific stages of the innovation process unveils the under-explored organisational challenges as well as key supporting activities inherent to the adoption of social media for innovation. Particularly, the emphasis on Public SM seems to be correlated to the observations on user/customer behaviour. A significant gap exists around adoption/launch and impact stages of innovation and exploration of company-built SM, company-licenced SM and innovation intermediaries. Thus, studies investigating the role of company-licenced SM (i.e. MS Yammer, IdeasProject, IBM Connections) could advance the understanding on how enterprise social media can benefit innovation. Exploration of barriers and challenges related to specific social media tool (i.e. exploring limitations of algorithms, IT/privacy protocols) at various innovation stages remains providential.

4. Future research directions

Propositions for research based on above findings, including promising areas for theoretical contributions, which could advance the knowledge in the discourse, are provided in this section. Directions for future research capture the shortcomings found in the systematic meta-analysis by highlighting under explored aspects of social media in innovation management. Particularly, the section addresses the final research question - *What are the promising avenues for the future development of research on social media in innovation and its management?*

4.1. Diversity of theoretical perspectives

Theoretical intention-behaviour perspectives currently utilised seem to correlate with well-known technology adoption issues, often explored in organisational studies. There is certainly a gap around resource-based perspective of social media in innovation activities. Further investigation on how organisation's tangible and intangible resources including internal psychological climate influence the

performance of social media in innovation processes could be of interest for managers in practice. Such investigations could leverage concepts from other disciplines such as cognitive psychology (i.e. self-efficacy, cognitive dissonance, observational learning) and economics (i.e. rational choice, market failure, transaction cost-economics) to explain why some firms are more successful in leveraging social media for competitive advantage through innovation, when others fail. Case studies on exemplary firms (and non-exemplary firms), utilising the grounded theory approach, could be of interest to theorists as well as promoters of innovation. Extending theories such as Maslow's hierarchy of needs (Maslow et al., 1970) could help explore how individuals within and outside the firm may have various needs and motivations, affecting their engagement or disengagement, hence influencing how social media tools can be implemented in innovation and its management. Accordingly, the first proposition is:

P1. *For the social media-innovation discourse to gain in maturity, researchers should consider multi-disciplinary research, testing and extending other relevant theories from various disciplines, outside the popular intention-behaviour lenses that have been applied to date, and harness the value of grounded approach to give the discourse its own theory.*

4.2. Multi-level research

Opportunities exist to explore the social media-innovation interaction from a multi-level theoretical perspective, to gain a better understanding of macro and micro-level facets (Klein et al., 1999). Some researchers (Du et al., 2016; Scuotto et al., 2017a) have explored the role of users/customers as social media participants while some have explored the role of business communities (Hitchen et al., 2017) and employees (Dahl et al., 2011). Yet, integration across internal and external participations and observations of differences at various stages of the innovation remains mostly unexplored. Furthermore, most studies have either explored organisations as a unit of analysis or focused on individuals, rather than adopting a holistic perspective. Researchers have mostly focused on one or two stages of innovation, predominantly generation/development stage with explanations focused on theoretical causes of social media engagement in those stages. Except for some authors (Dong and Wu, 2015; Konsti-Laakso, 2017; Peltola and Mäkinen, 2014) efforts by researchers on longitudinal aspects of social media-innovation interactions are limited. These longitudinal studies have adopted multiple theoretical perspectives using case study or field experiment methods to examine the relationship of social media tools within the context of a firm's innovation strategy. Yet, holistic analysis of the value of different social media types at various levels of participation across complete innovation ecosystem using an array of methods remains mostly unexplored. Consequently, the second proposition is:

P2. *For fully understanding social media's integration into innovation management, research needs to be appropriately holistic to expose multilevel social media-innovation interactions, rather than a single-minded macro or micro-level paradigm and; all types of SM and stages of innovation, especially interactions of those other than Public SM tools in adoption/launch and impact stages of innovation needs to be further explored.*

4.3. Social media-innovation paradigm framed as change in organisational practice, with implications for top of the pyramid

Scholars are yet to agree on a definition of social media that looks beyond its obscuring and myopic feature-focus context. To aid conceptualisation and theory development, we call for examination of the affordances social media offers in relation to innovation process (i.e. driver, enabler). Affordances in this case refer to the utility of social media in innovation. In this view, we argue that social media can offer

multiple affordances in innovation process and this can result in multiple outcomes, all of which should if of equal importance to scholars.

The establishment of social media paradigm as an enabler and driver of innovation activities and as a tool to achieve strategic competitive advantage is still in its infancy. These aspects of social media could be investigated through robust multi-disciplinary lens. For instance, acknowledging knowledge as an important aspect of innovation, Panda and Kapoor (2017) adopted the social exchange theory to explain top management's role in social media strategy. Likewise, Wang et al. (2016) adopted the social comparison and social identity theoretical perspectives to investigate how seller's social identity and social comparison facilitate innovation activities. Thus, social exchange theory (Emerson, 1976) and social network theory (Granovetter, 1973) could be operationalised to investigate the correlation between types of social media and innovation performance at various stages, with organisational resources, competences and psychological climate as mediator/moderator of the relationship. Furthermore, behavioural theory of the firm (Cyert and March, 1963) could provide a basis to explore the motivation and behavioural aspects of change within the organisation as a result of engaging or disengaging with a social media strategy for innovation and its management. Authors could leverage dynamic capabilities perspective (Teece et al., 1997) and evolutionary theory (Nelson and Winter, 2002) to survey how firms adapt to the changing social media paradigm and how they achieve competitive advantage by capturing its capabilities towards innovation management. Accordingly, the third proposition is:

P3. *Research proposals could be directed towards developing an understanding of the utility of various types of social media in relation to innovation performance at various stages, by framing it as practical issues in organisational change management.*

4.4. Social media-innovation paradigm framed at the societal level, with implications for bottom of the pyramid

Although some authors (Loukis et al., 2017; Miranda et al., 2015; Mount and Martinez, 2014) have examined the value of social media in innovation management at social community level of participation, articles directed at societal systems are limited. Analysis of social media engagement (and disengagement) at societal level and consequences to innovation performance at various stages, particularly in government related open innovation, could be providential in extending the reach of research in the discourse from corporate competitive strategy to problems of the diverse global communities. Thus the fourth proposition is:

P4. *Research proposals could be directed towards understanding the relationship of social media and innovation performance at societal level, exploring e-government and community level engagement and disengagement in open innovation towards social change.*

4.5. Towards new theory

Most empirical articles either report observations based on low level of theoretical underpinning or simply test the constructs of a borrowed theory in the context of social media in innovation management. While, both styles of approaching a research problem could provide insights, they limit theory development. Notably, some authors have adopted grounded theory approach (Bosch-Sijtsema and Bosch, 2015; Xie and Jia, 2016) to investigate the user/customer involvement in innovation processes. Some researchers (Loukis et al., 2017; Wu, 2016) have combined theories from different disciplines to explain the social media-innovation interaction. Repeated and contextual empirical testing of conceptual frameworks such as those proposed by Malsbender et al. (2014) and Callaghan (2016) could advance knowledge in the discourse and provide solutions for management-in-practice. Indeed, development of knowledge in the discourse should leverage its

connection with the *real-world* and build practical solutions for companies by making sense of theories, barriers to implementation and innovation impact. Implications of good theory building are 'practical precisely because it advances knowledge in a scientific discipline, guides research towards crucial questions, and enlightens the profession of management' (Van de Ven, 1989, p. 486). Thus, the fifth proposition is:

P5. *To advance social media – innovation discourse, it is now appropriate to bridge the gap between a-theoretical and theoretical articles, and engage in rigorous theory borrowing, theory testing and consolidation of empirical findings through quantitative analysis, while drawing on current qualitative richness and testing the limits of the proposed frameworks across various contexts.*

4.6. Contextual richness

The systematic meta-analysis revealed 12% or 14 articles with samples selected from Asian (incl. China) regions with majority of authors relying on data collection from European and USA regions (50%) and none comparing findings between the East and the West. East in this regard refers to the central regions in Asia including economies and community in East Asia, Central Asia, North Asia, South Asia, Southeast Asia and West Asia. The regions in the East thus include the nations of China, India, Japan, South Korea, Taiwan, Hong Kong, Singapore, Malaysia, Thailand, Indonesia and neighbouring countries. There are certainly unexplored opportunities in understanding contextual differences of social media in innovation management between East and the West in terms of management-in-practice, communication approach, organisational learning and cultural philosophies. Apart from some authors (Nguyen et al., 2015; Pan et al., 2017; Wu, 2016; Zhang et al., 2017) who have examined motivational and capability factors affecting innovation in eastern context, most others have focused on issues relevant to developed western countries. Given that by 2030, Asia's economy is estimated to be greater than that of USA and European nations combined (Burrows, 2012), it seems time is right to explore influences of institutional factors (i.e. democracies, monarchies) and culture factors (i.e. individualism-collectivism) on social media-innovation interactions. Authors could draw on communication context (i.e. content vs context, implicit vs explicit), paradoxical leadership and strategic vs dynamic fit to expose commonalities and differences in firms in the East compared to those in the West. Such investigations could improve contextual understanding of construct equivalence, salience and infusion, unveiling practical implications from how firms fulfil two disparate objectives and manage tensions resulting from barriers and challenges of social media use in innovation management. Thus, the sixth proposition is:

P6. *To extend the discourse to multi-cultural paradigms, researchers should examine contextual differences between the East and the West, especially in terms of institutional factors, cultural factors and strategic choices, focusing on how the commonalities and differences in social media-innovation interaction manifest over time.*

5. Concluding discussions

This systematic literature review paper has provided an overview of the current trends of social media paradigms in innovation and its management. The analysis showed that large numbers of articles on social media-innovation are a-theoretical, with qualitative methods being the preferred methodological approach. This paper has identified most popular theories, units of analysis, sample regions, types of social media and stages of innovation investigated. In addition to this, it reveals the most dominant social media paradigms currently used in innovation management, i.e. driver and enabler, as well as their conceptualisation of social media *in* innovation and social media *for*

innovation. Consequently, it is shown that discourse could evolve theoretically and contextually, with six propositions for research presented as future directions for the discourse. This paper is the first step towards consolidating the current research trends on social media-innovation interactions and paves a way forward towards understanding theoretical and contextual dynamics, encouraging further analyses to enrich existing qualitative findings.

5.1. Theoretical contributions

Social media offers one-to-many and many-to-many interactions beyond organisational, industry and market boundaries, fostering business intelligence in the process of ideation, development and commercialisation of innovations. For the future of competitive market conditions, our analysis of current literature at the intersection of social media and innovation reveal that the growing spectre of firms embracing innovations driven and enabled by data created using dynamic utility of social media, rendering other firms less relevant, should concern policymakers'. Our systematically developed propositions offer a clear challenge for academics – to look beyond social media adoption paradigms in innovation management and explore the utility of social media now and in the future. We argue that such studies call for evaluation of the potential emerging from harnessing data generated through social media interactions at various stages of innovation. Managers and practitioners, on the other hand, face a very different challenge. We identified behavioural perspectives dominate theoretical purview of social media's value-in-action. However, it remains providential that if attitudes do not align with the concept, then decisions may fail to support investment towards understanding social media's practicality in innovation management. As one article suggests in situations where managers are not cognizant of tool-innovation application churn, social media tools tend to negatively affect management evaluation and have no impact on new product development collaboration and concept generation (Marion et al., 2014). Our review of literature suggests that problems arise when lack of support towards use of social media in and for innovation result in unrealised opportunities impeding firm's performance. Thus, we conclude that for many innovative firms this is the time of reckoning. As socially constructed data becomes pervasive in business decisions - connecting people, machines and the firms, conventional innovators will have to continue to find new ways to remain relevant, access data and use it to enable innovative efforts. We strongly believe research addressing the propositions offered based on our systematic review of literature on social media and innovation can pave the way for the future of research in innovation management. Our findings allude to at least two necessary and significant actions. First, it encourages academics to look beyond the obvious Public SM (i.e. Facebook, LinkedIn, Twitter) and explore the less chartered role of Company-built SM, Company-licenced SM and Innovation Intermediaries SM in driving and enabling innovation. This requires academics to first embrace social media as a strategic choice in the firm's data value chain, drawing from exemplary cases such as MITRE, the research and technology firm that saw the use of social media resulting in comments on innovation proposals from wider group of employees (Holtzblatt and Tierney, 2011). Research in the discourse should explore the role of social media in democratising knowledge contributions (see Brandtzaeg and Følstad, 2016) and in creating a more inclusive culture in solving societal challenges through innovation.

5.2. Practical implications

There emerge several practical contributions from this study for managers and innovation management broadly. As the concept of innovation shifts from being 'closed' to 'open' (Chesbrough, 2004), a need exists to reorganise innovation management, emphasising the inside-out, outside-in and coupled knowledge transfer process (Chesbrough &

Appleyard, 2007) to explore and exploit socially-constructed data. This in turn requires purposeful shaping of routines to drive engagement with social media for internal and external collaboration. We highlight the growing understanding of social media and innovation as a formidable combination (Benitez et al., 2018; Brandtzaeg and Følstad, 2016; Carlson et al., 2018; Garcia-Morales et al., 2018; Treem and Leonardi, 2012). The summaries of affordances of social media as driver and enabler of innovation may guide managers who are planning to adopt or improve the current strategic focus of social media use in innovation process. The catalogue of findings and identification of a priori successful cases of social media use may be particularly useful in initiating and organising the social media strategy to enhance innovation outcomes. The essence of innovation is knowledge transfer. In this respect, organisations need to continue to invest in mechanisms that allow for effective, real-time and low-cost avenues to exchange information within and across organisational boundaries. To this end, our explanation of various types of social media (Public SM, Company-built SM, Company-licenced SM and innovation intermediaries) clearly groups potential categories of social media which can be leveraged at various stages of the innovation process. This grouping coupled with the conceptualisation of social media *for* innovation and social media *in* innovation under the paradigmatic view of driver and enabler respectively does provide managers with valuable systematic and constructive advice on structuring social media strategy. For instance, driver paradigm could be considered at the fuzzy front end of innovation to promote socialisation via information exchange, increased engagement and idea generation from a wider audience. The enabler paradigm is more suited during the development stage of innovation process where focus is on exploiting synergies and maximising gains through storage of information and integration of new forms of tacit knowledge in innovative products and services. This robust approach may in turn minimise uncertainties and improve the efficiency and efficacy of innovation processes. Nevertheless, as we have highlighted in the findings, the empirical studies examining the relationship between use of social media and innovation performance are growing, but limited. Importantly, managers may find that the pluralism of perspectives we found in current literature confirms that there is no 'one-size-fits-all' approach when it comes to social media use and innovation processes and experimentation may be an appropriate approach.

5.3. Limitations

This study has several limitations. First, the systematic literature review identifies current trends in the field and provides propositions for future research, yet the review does not empirically examine the propositions, which is the next logical step. Second, although we have used two large databases with significant number of indexed content, we have limited our search to Scopus and EBSCOHost. This means our final included body of knowledge could have omitted relevant articles. Some comparative studies of databases have found that Social Sciences journal articles are underrepresented in Scopus (Hicks & Wang, 2011; Mongeon and Paul-Hus, 2016), yet others have found that the representation is strong for articles in English (Meho & Yang, 2007; Mongeon and Paul-Hus, 2016). The third limitation is that we limited our search based on pre-defined set of inclusion-exclusion criteria. This means our final included body of knowledge has excluded book chapters, conference proceedings, non-peer reviewed articles and non-English articles. However, our methodological rigour and use of alternate keywords with search in title and abstract, we believe would have reduced the chances of an omitted paper bearing critical implications for our analysis and interpretation of the findings. Fourth, adopting the paradigmatic approach of driver – enabler may mean our conceptualisation of the interaction of social media and innovation may have neglected previous functional categorisation of utility of social media in organisations. Lastly, our study while identifies pluralism of social media affordances in and for innovation, future studies building

on this conceptualisation could address more specifically, how and why social media for and in innovation affects behaviour and performance at various levels of interactions. Clearly, there is a significant scope of research in the field and future studies could draw on the propositions provided in this review to advance the science and practice of innovation management.

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Declaration of interest

None to be declared.

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Appendix 1. Final included body of knowledge of Articles

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1	Ghezzi, A., Gastaldi, L., Lettieri, E., Martini, A. and Corso, M., 2016. A role for startups in unleashing the disruptive power of social media. *International Journal of Information Management*, 36(6), pp.1152–1159.
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Appendix 2. Category descriptions

Category	Description
Bibliographic details	Details of title, DOI, citation reference, year of publication, authors and journal as available from the database
Type of paper	One of the following categories – empirical, literature review, conceptual or conference review
Google Scholar citations	Number of citations recorded in Google Scholar at the time of review (July 2017)
Innovation paradigm	Identify the explicitly described or implicitly adopted innovation paradigm with relevant direct text from the articles if any
Social media paradigm	Identify the explicitly described or implicitly adopted social media paradigm with relevant direct text from the articles if any
Crowdsourcing paradigm	Identify the explicitly described or implicitly adopted crowdsourcing paradigm with relevant direct text from the articles if any
Innovation type[a]	Qualitative classification of the articles based on literature into the following categories – marketing innovation, open innovation, organisational innovation, process innovation, product innovation, service innovation, social innovation, technological innovation or unspecified.
Stage of innovation[a]	Theoretical classification of articles based on social media use into following categories – conceptualisation/market analysis, generation/development, adoption/launch, diffusion/promotion or impact
Social media type[a]	Classification of the articles based on the type of social media investigated or discussed into the following categories – company-built SM, Public SM, company-licenced SM, innovation intermediaries or unspecified
SM investigated[a]	Note all the explicitly investigated or discussed social media tools
Level of SM participation[a]	Classification of articles based on the following types of participants including in the study – business community, employees, social community, TMT, user/customers or unspecified
Nature of Barriers	Qualitative classification of the articles based on explicit or implicit barriers of social media use or adoption in innovation and its management. This classification included – IT/Security, organisational strategy, behavioural/cultural, technical and IPR/Privacy categories
Type of impact	Qualitative classification of the articles based on type of innovation impact discussed into the following categories - communities of practice/social groups, connectedness/connection to others, engagement/two-way idea building, openness/platform for free expression, participation/promoting conversation or unspecified.
Theories	Identification of predominant theoretical lens adopted in the article if any
Unit of analysis[a]	Classification of unit of analysis in the article into following categories – organisation/s, managers/TMT, individuals/ employees/users, firm initiative, participant interactions, industry experts or not applicable/unspecified.
Sample frame	Identify the source of the sample
Region	Identify the country where the investigation was carried out
Method	Primary method used in the article, classified into one of the following categories – quantitative, qualitative, mixed or not applicable/unspecified.

Approach	Primary methodological approach used in the article, classified into one of the following categories – inductive, deductive, abductive, inductive-deductive, deductive-inductive, or not applicable/unspecified.
Strategy	Primary methodological strategy used in the article, classified into one of the following categories – grounded theory, survey, case study, ethnography, experiment, reflection, archival research or not applicable/unspecified.
Time horizon	Classification of the articles based on the following categories – cross-sectional or longitudinal
Data collection method/s[a]	Identification of primary data collection strategy used in the article
Analysis technique/s[a]	Identification of primary analysis technique used in the article

[a] An article was allocated to multiple categories were appropriate.

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