
Social media representations of innovation by non-users: everyday problem solving.

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Abstract:

This exploratory study extends the conceptual space of open innovation. We build on previous work recognising opportunities to contribute to a firm's innovation processes, particularly ideation, from the external environment. Initially, scholarship focused on users' intimate knowledge of a firm's products and services such as suppliers and lead users. More recently, affordances of digital technologies have broadened the scope of contributors to include, for example, crowdsourcing. We go a step further and consider the often-overlooked group 'non-users'. Specifically, employing a novel two-stage approach incorporating network visualization based on 7607 Instagram #innovation posts supplemented by qualitative analysis, we explore the contribution non-users might make to firms' innovation activities. Findings suggest that non-users conceptualise innovation as problem solving but represent it through ludic and utopic narratives. The value of non-users in the innovation process is not in addressing specific technical problems but in offering a new lens through which to appreciate the phenomenon of innovation itself.

Keywords: innovation; social media; non-users, Instagram; images; ludic; utopic;

1. Introduction and problem identification

Previous research has shown that many innovations originate not with the manufacturer but from external sources (Piller and Walcher, 2006) and that taking a broader approach to searching for external knowledge can yield positive dividends for innovative firms (Laursen and Salter, 2006; Roberts et al., 2016). However, this observation is tempered by the caveat that external search can be expensive, time-consuming and, on occasion, unproductive, and so firms must make conscious decisions about where, when, what and how to search for new knowledge and insights for innovation. Typically, the literature has focused on external actors who are invested in some sense with the focal organization, perhaps as customers, suppliers, technological complements or lead-users.

Recent research has begun to turn attention to the role of non-users, members of the public who are not customers or users, who have no connection with the focal firm, its products or services, as an important source for new knowledge. Non-users represent an increasingly important source for innovative ideas and alternative visions (Nicholas et al., 2015) as they bring unfettered notions of possibility and interpretations to the process (Fritzsche and Duerrbeck, 2020). However, this is a difficult group to access and the precise nature of their contribution to a firm's innovation process remains unclear.

Social media platforms and consumer-generated content have come to play an increasingly important role in firms' innovation processes allowing customers, users and the wider public (non-users) the opportunity

actively to engage with and participate in firm-sponsored innovation activity (Leonardi and Vaast, 2016; Ogink and Dong, 2019). Furthermore, digital technologies, including social media, assist individuals' in 'voicing' ideas and perceptions about innovation (Lamberton and Stephen, 2016). Consumers interact proactively in innovation processes through, for example, product forums and review postings, and these 'amateurs' have contributed valuable content for product innovation (Haavisto, 2014). However, given the relative novelty and mutability of social media and as firms continue to learn how to make best use of their affordances, the challenge of learning where, when and how to benefit from social media's potential remains (Bhimani et al., 2019).

To date, the research focus has largely resided with existing and aspiring customers who have direct engagement with a focal company, resulting in non-customer social media users being overlooked in spite of the important role they too can play in innovation (Rosenzweig, 2017).

2. Background and Research Questions

That innovators and users frame innovation(s) in different ways is not new (Goode et al., 2013). Caraballo and McLaughlin (2012) show how the meaning of the word innovation is perceived differently when focusing on IT employees, comprising multi-dimensions in terms of being new, improving or changing something. Indeed, the same innovation can mean different things to different people, for example, in the organizational context, it might be sustaining to some and disruptive to others (Christensen, 2006). As we experience an acknowledged shift from a company-centered innovation to a consumer-centered innovation paradigm (Füller et al., 2013), the representations by individuals of

innovation gain a revitalized importance. Lowe and Alpert (2015) have noted that individuals are influenced by the utilitarian (cognitive) and hedonic (emotional) responses that innovation invokes. Similarly, ‘creative consumers’ exhibit utilitarian and hedonic motivations to participate in innovation activities (Robson et al. 2019).

Although lead-users (von Hippel, 1986) exhibit a clear solution orientation and may help firms to design completely new product solutions (Hopp et al., 2018), the wider public can also be more broadly seen as a source of insights and novel perspectives. Social media are increasingly seen as an important tool to support this (Mount and Martinez, 2014): they are helping change the ways in which products are developed and managed, either by presenting new opportunities for firms to gather market information or by providing an infrastructure for collaborative idea generation, ideation and co-design (Roberts et al., 2016). Indeed, the innovation process, from a management perspective, requires individuals who “*will learn to read the signals from large, diverse, disconnected, and unstructured pools of data generated by users[of social media]*” (Roberts and Piller, 2016: 11).

The growth of social media and the increasing relevance of consumer-generated content represents an important opportunity to view consumers as active protagonists in innovation, employing a ‘snapshot aesthetic’ (Colliander and Marder, 2017) which can be viewed as more authentic, appealing and resonant by specific audiences with whom impact is increased (Van Laer et al., 2019). Yet from an innovation perspective, academic research into the use and image sharing of consumer-generated pictures in social media remains sparse (e.g. Zeng and Wei, 2013; Yang and Wang, 2015). Additionally, research into the incorporation of

consumer-generated visual artefacts reflecting representations of innovation by wider societal members (Schreier et al., 2012) remains limited.

Beyond representation of innovation, communication is also important at the ‘front’ end of the innovation process for ideation. Long after the advent of digital technologies, Roberts and Pillar (2017) found firms still did not comprehend the different forms and functionalities of different social media platforms as a communication or even a listening tool. This echoes earlier suggestions by Cheney et al (1986) who noted that communication of innovation received less attention than other aspects particularly the spread of informal ideas about innovation across different communities and social systems.

This paper considers the phenomenon of innovation through the lens of consumer behaviour. In particular, we focus on the ‘what’ and ‘how’ of social media posting that represents innovation *per se* rather than consumer motivations to innovate. Our two interrelated and interdisciplinary research questions are:

1) How, semantically, do non-users on social media represent the phenomenon of innovation? What do the semantic representations embedded in the text of consumer-generated images tell us about conceptions of innovation?

2) How, pictorially, do non-users on social media represent the phenomenon of innovation? What do the symbolic representations embedded in consumer-generated images tell us about conceptions of innovation?

3. Research Design

In this exploratory study, we address both these queries. Specifically, we adopt a novel two-stage approach, first, a semantic text network analysis to identify the ‘what’ of the words associated with #innovation; second, investigating the ‘how’, exploring the visual symbolic, pictorial representation of innovation. We incorporated network visualization based on 7607 Instagram #innovation posts, followed by qualitative analysis of the visual and textual content of a subset of the data to discern non-users’ conceptualization of innovation. 32% of all global Internet consumers use Instagram and the platform has become an important data source for researchers, including, for example, to categorize posted images (Hu et al., 2014). As Instagram has the ability to capture and share consumer-generated images, as such it offers greater insight into the ‘amateur’ creation and posting of individuals’ own representations of innovation.

Stage 1.

Instagram posts containing the hashtag #innovation were collected over a period of 2 weeks and uploaded to NodeXL. The use of hashtags as an appropriate search and filter tool has been documented by Highfield and Leaver (2014) amongst others. NodeXL is an open source software platform which enables the mining, cleaning, analysis and visualization of large data sets such as available via social media sites (Shneiderman, 2011). Raw data were cleaned to exclude repeated material, material not in English and material posted by commercial organizations. Table 1 provides the cleaned outline data from NodeXL, illustrating the number of #innovation posts (7607), along with the twenty most frequently occurring associated words: i.e. words hashtagged alongside #innovation in any Instagram innovation post. Semantic network analysis via NodeXL was used to arrange these into meaningful networks (see Figure 1) capturing

and reflecting ways in which words from original posts are linked (Hill, Kothari and Shea, 2010).

Hashtag before or after #innovation	Frequency Count
<u>Innovation</u>	<u>7607</u>
Design	1196
Technology	940
Business	798
Entrepreneur	777
Startup	735
Inspiration	615
Tech	555
Motivation	512
Marketing	495
Success	494
Fashion	485
Creativity	479
Entrepreneurship	462
Art	456
Creative	403
Startups	373
Lifestyle	350
Instagood	350
Style	340
Ideas	313

Table 1. Twenty words most frequently associated with #innovation

Stage 2

While the semantic textual description of Stage 1 highlighted the most frequent words associated with #innovation on Instagram (the “what”), to respond to the second research question of “how” consumers represent innovation pictorially, Stage 2 explored the visual symbolic representations of innovation through analysis of a purposeful subset of 30 Instagram images. The subset was the point at which data saturation occurred and was considered sufficient (Morse and Maddox, 2014). The visual analysis incorporated the text that consumers linked to the image to strengthen the explanatory power. The visual analysis, drew on semiotic and rhetorical theories to provide a systematic and nuanced analysis of the individual elements that made up the picture-text (e.g., McQuarrie, 1989; Stern, 1989; Rose, 2016).

Our analytical framework combines aspects of visual design (Pieters et al., 2010; Rosenholz et al., 2007) with McQuarrie and Mick’s (1999) rhetorical symbols analysis. Further, it includes text-image interplay (Barthes, 1977; Kress and van Leeuwen, 2006; Rose 2016), and Floch’s (1988) semiotic square. This multi-faceted framework enabled integrated visual/textual analysis (Table 2) to provide novel insights into non-users’ conceptions of innovation.

CONSTRUCT ANALYZED	DEFINITION
<p>Basic visual and design</p> <p><i>Feature and structural complexity</i> (Donderi, 2006; Rosenholz et al. 2007; Pieters et al., 2010)</p>	<p>Photographs that contain more detail and variation in their basic visual features, color, luminance, and edges are complex. Visual clutter (high level of detail pattern of color, luminance, and edges) VS. Visual simplicity (low level of detail pattern of color, luminance, and edges).</p> <p>Design complexity is higher when the photograph contains more rather than fewer objects, are irregular rather than regular, are dissimilar rather than similar in shapes, textures, orientations, and/or colors, are asymmetric rather than symmetric arrangements.</p>
<p>Rhetorical symbols</p> <p>Figurative language</p> <p>(McQuarrie and Mick 1999)</p>	<p>Use of the multi-level taxonomy figurative language. Visual metaphors fundamentally represent artful deviations from expectations.</p>
<p>Text-Image interplay</p> <p>(Barthes 1977; Kress and van Leeuwen, 2006)</p>	<p>Dependence of the image on the text. New meanings are added to complete the message, or vice versa (<i>relay</i>). The same meanings are stated in a more definite and precise restatement of the image (<i>anchorage</i>).</p>
<p>Floch's Semiotic Square</p> <p>Four broad categories of semiotic meanings: Utilitarian, critical, ludic, and utopic</p> <p>(Floch, 1988)</p>	<p><i>Utilitarian</i> (communication of utility, of practical values); <i>critical</i> (communication of cost-effectiveness values); <i>Ludic</i> (communication of enjoyment and fun, hedonic values), and <i>utopic</i> (communication of a social impact, a final aim, existential values)</p>

Table 2. Integrated visual analysis approach. Source: Authors' own incorporating key authors and constructs.

Stage 2 comprised three qualitative steps in which we mitigated against subjectivity and coder bias by having two of the authors conduct separate analysis of the images, followed by cross-checking for inter-rater reliability and consistency (Glaser and Strauss, 2009). Furthermore, an independent, visualization expert reviewed the processes as a critical peer to enhance trustworthiness as an element of rigour (Lincoln and Guba, 1985). Authenticity of the data was determined by the diversity of the sample in Stage 1 and the level of fairness of the choices of the purposeful subset in Stage 2 (Lincoln and Guba, 1985).

The first step comprised of analysis of images and associated text, following Rose's principles of image based compositional interpretation (Rose, 2016) through open coding: step two was the identification of common recurrent patterns in the form and content of the images: and, step three analysis of shared themes. This analysis resulted in four semantic dimensions underpinning the representation of innovation: triggers, abilities, opportunities, and outcomes. For example, the word 'motivation' belongs to the trigger dimension, 'entrepreneurship' to the ability dimension, 'technology' to the opportunity dimension and 'success' to the outcome dimension. The words were coded to the dimension based on the fit of each word with the dimension statement emerging from step 3 (analysis of shared themes) of Stage 2. Table 2 outlines the constructs adopted in the analysis (further discussed below).

Figure 1. Semantic network map of #innovation resulting from Stage 1

The semantic network map depicted in Figure 1 conveys a visualization of the words associated with #innovation from our sample and encapsulates all the innovation hashtags with ≥ 20 associated connecting words. The size of the word in the image corresponds to its overall occurrence frequency in the dataset as illustrated in Table 1. This visualization addresses the question of ‘what’ constitutes innovation according to non-users. These networks illustrate the prevalence of both creative (e.g. ‘art’, ‘design’) and commercial (e.g. ‘business’, ‘entrepreneur’) ways of depicting innovation on Instagram.

In order to offer an understanding of the innovation images posted on Instagram four photographs, chosen as prototypical examples (Prosser and Schwartz, 1998; Prosser, 2005) of the four semantic dimensions (triggers, abilities, opportunities, and outcomes) are presented in Figures 2, 3, 4, and 5 and a detailed discussion now follows.

Figure 2, is an example from the category that communicates the “triggers” of innovation. The image presents a close up of a few objects and despite being highly dissimilar the author appears to have arranged them deliberately. The triggers are the drivers of innovation in terms of the constraints/limits that challenge the mind to look for unconventional ways to get around such obstacles. The problem of “*having no bowl or spoon*” to eat cereal makes the author feel “*desperation*” and activates an alternative/different use of everyday artefacts to remedy it. A perceived need is the starting point for innovation. In this example innovation is represented as a daily/real/close problem-solving activity. The tongs used

instead of a spoon embody a strongly rhetoric figure, an oxymoron, juxtaposing the functions that appear to be contradictory in nature as tongs are not usually eating implements. The artefact's function is divorced from its usual purpose (McQuarrie and Mick, 1999) and used as if it were a spoon. The hashtags support the image by utilizing the hyperbolic rhetoric figure twice. “#Desperation” and “#Tedtalks”, confer an exaggerated emphasis both to the initial emotional state and to the solution the innovator found, conveying to the process a ludic/playful quality (Floch, 1988).



Figure 2. The Trigger dimension of consumer generated #Innovation

Figure 3, ‘Ability’ is drawn from the sub-set illustrating the innovator’s exposition of creative talent and interest more than of a technical skill or knowledge. The detailed image includes a cluttered environment, through which the protagonist emerges. The trophy, a symbol of success,

represents the recognition of an innovative solution generated by somebody that could be any of us. Age “*You are not too old or too young to innovate*” and geographic provenance “*#AfricaBeHeard*” are the accompanying text and hashtags which add positivity to the communication. This image suggests that anybody is able to achieve innovation, and thus innovation is for everyone. Ideas for new solutions originate from an individual’s abilities that are rooted in passion and stem from some motivation. Such motivation can be intrinsic but also extrinsic, for example as in Figure 3, a competition, culminating in the winning of the trophy. Considering the kind of solution found by the innovator, rooted within broader social connotations of doing good for the world through her sustainability initiative, the interplay between the text and the image conveys a utopic meaning of innovation (Floch, 1988).



You are not too old or too young to innovate! “#AfricaBeHeard

Figure 3. The Ability dimension of consumer generated #Innovation

Figure 4, represents the ‘Opportunity’ dimension. This refers to the environmental context from which innovation emerges. A highly detailed image is presented, representing a complex, cluttered environment, where objects are highly dissimilar and irregular (Pieters et al., 2010). The image is redolent of a place/space where a “making”, do-it-yourself philosophy is evident. In this case, experimentation facilitates innovation, fueled by an alternative use/reuse of material scraps that become the input for something new. The textual, figurative metaphor acts as support for the concept of innovation as a transformative process. The text “*I am cooking something up in my design kitchen!!*” is a rhetorical enactment that uses metaphor to transfer the concept of kitchen and creativity to the innovation domain. The analogy with the kitchen domain evokes the act and pleasure of eating, supporting the representation of innovation as a hedonic experience. The text serves to offer a more definite statement of the image, in terms of making the abstract concept of “transformation/production” attributed to innovation, more concrete.

Both the metaphor and analogy support the notion of innovation where the environment is meant to favor a hands-on/manual approach to innovation. The meaning embedded in the interplay between text and image is ludic, in terms of both the entertainment and the pleasure associated with the process (Floch, 1988).



*I am cooking something up in my design kitchen!!! Will keep you posted.
#Creative #Design #innovation #funtimes*

Figure 4. The Opportunity dimension of consumer generated #Innovation

Figure 5, The ‘Outcomes’ dimension presents an outdoor situation, where one object is evidently highly incongruent with its setting (Pieters et al., 2010). The image conveys a misplacement of the artefact. The photograph depicts one woman captivated by the appearance of a free-standing nail varnish bottle spilling its content onto the pavement. Here, artful deviation is created in two ways: first, the visual ‘trickery’ that seems to omit any kind of support for the nail varnish bottle (which actually remains aloft by using a hidden support embedded in the dripping fluid). Second, a displacement of reality in terms of size and function as the size of the bottle is substantially exaggerated as the main theme of the photograph. Furthermore, by viewing the nail varnish in a public environment, where it is out of place, a change in the function of the artefact is implied

(McQuarrie and Mick 1999). Different from the photograph in Figure 2, this image is a visual documentation of an outcome of innovation, but that the outcome (the free-standing nail varnish bottle) is not the result of a Do-It-Yourself act. This final category endorses deviation and misplacement as well as the ludic meanings of entertainment and visual pleasure as illustrated by the comment *“This is cool...I can’t believe this, is it a joke? - this is crazy but amazing at the same time”*. Such meaning is once more supported by the interplay between text and image (Floch, 1988).



Figure 5. The Outcome dimension of consumer generated #innovation

5. Discussion

Our findings illustrated that innovation is narrated by ordinary people using both utopic and ludic forms of communication to represent the solving of commonplace challenges that may however have important

broader social impact. Innovation is illustrated as being less about technical/scientific discovery and more about a domestic/everyday life that is nurtured by an environment that encourages a learning-by-doing approach. The findings of this study affirm that innovation is a process involving a bottom-up, do-it-yourself approach. When facing a trigger, motivated non-users are able to apply creative resources that result in an innovative solution. While literature on innovation ideation displays a common foundation built on concepts of market and technical breakthroughs (e.g. Garcia and Calantone, 2002) or radical new products (e.g. O'Connor, 2008), the consumer-generated narrative is quite different, in terms of innovation being represented as able to solve everyday problems close to non-users' lives.

The analysis suggests these consumer-generated social media photographs are cognitively complex messages. The evidence from this study confirms non-users' ability to be creative (Berthon et al., 2008; Robson et al., 2019) by crafting deviations through the interplay of symbols and text. The findings indicate the value of social media consumer-generated images does not lie in the technical qualities of what is shared but in their ability to capture how innovation is perceived and, especially, represented and communicated: the 'rough and ready' amateur effect (Coliander and Marder, 2018). Non-users can be regarded as active cultural producers of a wider notion of innovation than currently realized. By adopting rhetorical figures non-users are capable of representing innovation in a creative way, going beyond its mere reproduction.

Innovation may be expressed as a hedonic experience, where visual rhetorical figures are utilized to express how innovation is a route to pleasure by doing something in a different way. This study illustrates the

point made by Rogers (2003) in that innovation is an idea, practice, or object perceived as new by the individual and extends this notion to include innovation being expressed as solving everyday problems in new ways.

Figure 6 illustrates a conceptualization of the communication of innovation by non-users on social media. This conceptualization offers simplified insight for scholars and practitioners of the social media sharing of innovation thus responding to both Roberts and Pillar's (2016) assertion that organizations did not know how to utilize or manage social media for innovation and also replying to Fritzsche and Durrbeck's 2020 suggestion that 'digital artistry' was potentially valuable as a research avenue for this topic. The four dimensions, triggers, abilities, opportunities, and outcomes are interdependent as there must be a trigger for innovation, an ability to enact innovation, an opportunity for innovation to occur, and the outcome of the artefact of innovation which can be captured by photography and shared through social media. These four dimensions are narrated via ludic and or utopic mechanisms of communication between non-users . The use of ludic or utopic mechanisms conveyed through the rough and ready aesthetic of the amateur social media photographer provides evidence of how differently innovation is communicated by non-users as opposed to organizational visualization and communication of innovation.

Through the application of Floch's (1988) taxonomy of semiotics, this study reveals two kinds of narrative within the social media consumer-generated images of innovation: ludic communication with a humoristic twist and displacement, and also a utopic narrative, where utopic suggests a 'higher' goal rather than a sense of the 'illusory' and 'ethereal'. Ludic narrative can be seen in terms of enjoyment and fun (Figures 2, 4 and 5),

and utopic displayed through reference to societal impact (Figure 3). While Lowe and Alpert (2015) have noted that individuals' evaluations of innovation are influenced by the utilitarian (cognitive) and hedonic (emotional) dimensions of the product's innovativeness, this study shows that when non-users visually represent innovation the dimension evoked is predominantly emotional, being either ludic or utopic.

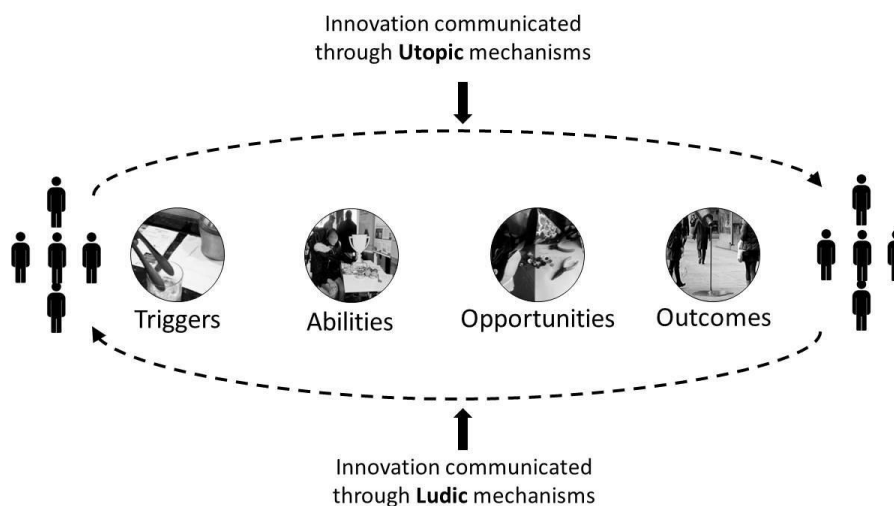


Figure 6. Non-users' conceptualization and communication of #innovation.

6. Contributions and conclusion

In respect of the innovation literature, this paper's contribution relates to the fuzzy front end of innovation, information search and ideation (Kim and Wilemon, 2002). It further contributes to our understanding of innovation from a social constructionist perspective through our narrative, symbolic, contemporary approach (Coopey et al., 1997). The early identification of ideas and opportunity are an essential part of the innovation process. It has developed theory, regarding the symbolic

representation and communication of innovation by non-users through ludic and utopic narratives. In doing so Robson et al.'s 2019 study is extended to provide more complete knowledge of the 'what' is communicated and the 'how' innovation is communicated. In situating the study within the social media context, this study partly fills the lacuna of how innovation can benefit from social media (Bhimani et al., 2019).

For innovation management scholarship this study has provided evidence of the potentiality of the inclusion of non-users, extending Boudreau and Lakhani's 2013 work on the value of the 'crowd', and supporting Nicholas et al (2015) and Chesebrough (2003) assertions of the necessity to look to a broader landscape for innovation. We have proposed that non-users can be an increasingly distinctive actor within this field with the potential to take individuals and organizations away from their 'existing frames of reference' and so, potentially, have an important contribution for radical innovation (Bessant et al., 2010). Furthermore, this study illustrates Roberts et al.'s (2016) observation that the value from a broader search is not in solutions to firms' technical problems, but more in nuanced understanding of environmental characteristics, and future trends. Evidence has been provided that innovation is narrated by ordinary people to represent the solving of everyday, commonplace challenges that may however have important broader social impact.

Potential avenues of future research, derived from our findings, include further nuanced focus on how innovation is portrayed and shared by non-users as the solution to everyday, commonplace challenges in daily life. Questions might include, what are the common every day challenges in which innovation is perceived to be a solution and can these be

categorised in a way meaningful for innovation management? In addition, this type of narrative, social construction approach to innovation could be utilised to investigate particular external groups, such as the elderly and their representations of innovation or applied to specific product categories which appear in social media feeds such as household goods.

This paper has provided innovation management with a route to access a wider range of communities and people, all of whom have contributions to make regarding innovation. We have illustrated an alternative approach which offers a different conceptualization of innovation and although this may challenge established innovation management perspectives, it may offer new possibilities for ideation.

ACKNOWLEDGEMENTS

Dr Richard Adams acknowledges support from the European Union's Horizon 2020 research and innovation programme under grant agreement No 810329 (KEEN).

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