

B2B value co-creation influence on engagement: Twitter analysis at international trade show organizer

Co-creation influence on engagement

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Abstract

Purpose – This paper studies, based on the theory of service-dominant logic, the effect of value co-creation practices (linking and materializing) on engagement dimensions (popularity, commitment and virality). The main objective is to analyze the influence of value co-creation practices on engagement at international trade shows organizer association on Twitter.

Design/methodology/approach – This paper studies the usage of Twitter by the Specialty Food Association, which organizes one of the top five foods and beverage international trade show in the United States. To achieve the research objective, the authors have analyzed 1,608 posts on Twitter from the Twitter account @Specialty_Food. A content analysis was performed using Krippendorff's (2004) recommendations, and the data were analyzed using regression analysis with optimal scaling and Kruskal–Wallis Test.

Findings – According to the results, some materializing practices influence popularity, commitment, virality and global engagement on Twitter. While the usage of some linking practices influences respectively commitment and popularity.

Originality – These results provide valuable information for business-to-business (B2B) contexts and answer a research gap reported in previous literature, which affirms that more research is needed about the relationship between service systems and engagement. From a general view, to generate more engagement on social media in B2B contexts, it is recommended to prioritize posts that incorporate live and online events based on collaborative and dynamic human interactions, following by business ideas and business cases.

Keywords Business-to-business (B2B), Value co-creation, Service-dominant logic, Engagement, International trade shows, Social network, Twitter

Paper type Research paper

1. Introduction

Trade shows represent, nowadays, recurrent business events that facilitate diverse forms of commercial and social exchanges among key stakeholders of an industry (Tafesse and Skallerud, 2017). They present an opportunity to sell, reinforce contacts, maintain the brand image and access new markets (Godar and O'connor, 2001). In this regard, for many business-to-business (B2B) firms, trade show participation is a key element of their marketing mix, often second only to the cost of the salesforce (Gopalakrishna *et al.*, 2022). As Sarmiento and Simões (2018) point out, international trade shows (ITS) can provide great opportunities for



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businesses to build business positions in the international market. If visitors get engaged with a trade show, the organizer and exhibitors get benefits as well (Gopalakrishna *et al.*, 2019).

Recently, literature has recognized the usefulness of social media in promoting trade shows (Lapoule and Rowell, 2016) because improves the trade show's performance (Singh *et al.*, 2017). Even more, social media contributes to B2B engagement, an essential issue in research about social media (Brodie *et al.*, 2013; Hollebeek, 2019).

On the other hand, the study about the relationship between value co-creation practices and engagement is relevant for many reasons. First, because engagement predicts key variables for markets as purchase intention, help intention and feedback intention (Hsieh and Chang, 2016). Second, value co-creation practices are an emerging issue; consequently, more research is needed about it. Third, there are yet few studies about the relationship between co-create value practices and engagement in social media.

Despite the relevance of the trade shows, and according to Lilien (2016), more studies on B2B are needed and especially using analytics to reach significant conclusions (Lilien, 2016). In that direction, our work focuses on studying analytics about B2B communications in social media.

Considering the abovementioned, the aim of this research is to analyze the influence of value co-creation practices on engagement at ITS organizer association on Twitter. According to Frow *et al.* (2016), more research about the impact of co-creation practices on relationships within a specific context is needed.

In general, first, this study responds to a recent call for research on the value co-creation process (Frow *et al.*, 2016). The results may help to understand the co-creation process and its influence on relationships (Frow *et al.*, 2016; Kohtamäki and Rajala, 2016). Second, the present research focuses on a single case study that offers unique opportunities to understand the micro-practices of co-creation and the process of value co-creation (Kohtamäki and Rajala, 2016). Third, there are yet few studies about the relationship between co-create value practices and engagement in social media (Fernandes and Remelhe, 2016). And fourth, our work applies statistical methods to find nonlinear relationships (Kohtamäki and Rajala, 2016).

In sum, this research contributes to the conceptualization of co-creation practices in trade shows, the understanding of the value co-creation process in B2B contexts, and the measure of co-creation practices (because it is proposed as an adaptation of a previous methodology for applying in Twitter). Additionally, there are practical implications in our work. More specifically, this research proposes actions in the usage of value co-creation practices by B2B actors on social media because, in general, its results demonstrate the usefulness of the value co-creation practices for the market, generating engagement with brands in B2B contexts. From a general view, the study suggests prioritizing posts that incorporate live and online events based on collaborative and dynamic human interactions, followed by business ideas and business cases on Twitter. In sum, its findings can help to improve the trade show performance and, consequently, exhibitors' results (Gopalakrishna *et al.*, 2019) and open the doors to further research (i.e. the study of the influence of other variables on engagement in B2B contexts, or the analysis of other variables that can influence the co-creation practices or it can be studied the usage of co-creation practice in other ITS).

2. Theoretical framework and research hypotheses

2.1 Conceptualization of co-create value and theoretical approaches

Value co-creation started to be studied as early as the 1970s in the field of marketing (Grönroos, 2012; Terblanche, 2014). According to Terblanche (2014), value co-creation was called customer participation at the beginning, and it was mentioned for the first time in a

paper by Lovelock and Young (1979). Nevertheless, the term known as value co-creation has become a researched construct since Vargo and Lusch (2004) identified that marketing was turned more service-centered (Merz *et al.*, 2018). According to Saha *et al.* (2020), this concept has its origin in the proposition that consumers are 'co-creators of value' and that companies cannot offer value by themselves.

In marketing literature, researchers have variously conceptualized value co-creation, and their definitions refer to many aspects (Kohtamäki and Rajala, 2016). Table 1 shows that researchers have called value co-creation in different ways (i.e. co-production, co-design) (Payne *et al.*, 2008; Kohtamäki and Rajala, 2016). However, it is most common the term value co-creation. Together with its conceptualization, value co-creation can be studied from many

Year	Concept	Definition	Authors
2004	Co-creation of value	The process of involving the actions of both a provider and a consumer through which experience is created	Prahalad and Ramaswamy (2004)
2011	Co-creation, a practice-theory	"... we thus conceive of practices as background coping skills that simultaneously limit and enable interactions between provider and customer" (p. 355)	Echeverri and Skålén (2011)
2012	Value co-creation	"... value co-creation behavior as a multidimensional concept consisting of two higher-order factors, each made up of multiple dimensions. These two factors are customer participation behavior and customer citizenship behavior" (p. 5)	Yi and Gong (2013)
2015	Co-created service experience practices	"... our conceptualization that service experiences are experiential, relational activities and interactions developed with the customer and potentially other actors ... " (p. 271)	McCull-Kennedy <i>et al.</i> (2015)
2016	Value creation	"... value creation has been studied at least on four levels: at firm-level, within dyadic relationships, as well as in networks and ecosystems (Frow <i>et al.</i> , 2014)" (p. 9)	Kohtamäki and Rajala (2016)
2016	Co-creation practices	Activities classified into three dimensions Linking Materializing Institutionalizing	Marcos-Cuevas <i>et al.</i> (2016)
2016	Co-creation activities	In theoretical terms, this research study contributes by studying the ways in which companies might foster the co-creation process by raising customer resource levels	Alves <i>et al.</i> (2016)
2018	Value co-creation	"... all-round involvement of consumers in the entire corporate processes (CEB) and a high sense of belonging to the firm supplier (commitment) encourage value co-creation" (p. 151)	Botti <i>et al.</i> (2018)
2018	Co-creation value (CCV)	"... we define CCV as the actors' appraisal of the meaningfulness of a service by assessing what is contributed and what is realized through collaboration" (p. 72)	Busser and Shulga (2018)
2022	Value co-creation-	"Following previous studies, we consider value co-creation as a multidimensional concept that includes linking and materializing activities to be analyzed in international B2B contexts in its relationship with 'virtual' engagement"	The authors

Source(s): Own elaborated

Table 1.
Conceptualization of
value co-creation

perspectives and theoretical approaches (Saha *et al.*, 2020). Nonetheless, this paper has focused on experience logic, a perspective that comes from service-dominant logic (S-D logic). This approach focuses on skills and knowledge (operand resources) instead of tangible resources such as raw materials and machinery (operand resources) for creating a competitive advantage for the firm (Saha *et al.*, 2020). This election is based on diverse motives, as explained below.

Overall, value co-creation is a keystone of the service perspective in marketing (Grönroos, 2012). In this context and according to literature, the S-D logic can be considered as an umbrella for the comprehension of service-based value co-creation (Kohtamäki and Rajala, 2016). For example, recent studies (i.e. Brambilla *et al.*, 2022; Klafke and de Oliveira, 2022) propose the use of this approach in the building of value co-creation in diverse industries. With it, there is an approach that comes from the S-D logic and considers engagement platforms even more relevant for value creation. This approach has been proposed by Ramaswamy (2011), and it is called an alternate logic of value creation.

According to Ramaswamy (2011), the alternate logic considers that every interaction between firms and consumers on social media creates an experience, and consequently creates value; a value that it is based on collaborative, dynamic, contextual and generative human interactions.

In this sense, contemporary researchers consider value co-creation as an interaction among actors, and the quantity of studies about this construct reveals that value co-creation is a significant area for current and future research (Kohtamäki and Rajala, 2016). Following the proposal of Marcos-Cuevas *et al.* (2016), value co-creation is formed by three dimensions:

- (1) *Linking* is defined as “mobilizing social connections and networks”, and it is operationalizing as practices of (1) co-diagnosis (collecting and organizing information for collaborative use), (2) co-ideation (generating and suggesting ideas, communicating and sharing, engaging) and (3) co-evaluation (commenting and selecting ideas) (p.100).
- (2) *Materializing* is conceptualized as “operational practices related to the production of a value co-creating offering”, and it is operationalizing as practices of (1) co-design (developing concepts and knowledge), (2) co-testing (prototyping and improving the offering, giving feedback) and (3) co-launching (creating and managing information, advertising, marketing and diffusing information) (p.100).
- (3) *Institutionalizing* is defined as “organizational practices related to the design of institutions and structures to capture and retain value created”, and it is operationalizing as practices of embedding, that can be measured by the development of rules, norms and standards (p.100).

These three dimensions are useful for the development of the present research because (1) the authors propose a theoretically-grounded and empirically-informed classification of value co-creating practices, and (2) they focus on defining value co-creation practices in B2B contexts.

According to the literature, practices of linking and materializing are related to engagement (Marcos-Cuevas *et al.*, 2016). However, there was no found evidence of a relationship between institutionalizing practices and engagement, maybe because social media rules, norms and standards. Consequently, the present investigation will focus on an analysis of linking and materializing practices.

2.2 Effects of value co-creation: the engagement (commitment, virality and popularity)

According to the literature review, value co-creation has beneficial effects on companies (loyalty, engagement, satisfaction among others). Considering the context of our work,

engagement was selected as a variable of interest because it is a central outcome to study in social media contexts (Brodie *et al.*, 2013). In this sense, literature has proved that co-creation practices have some effects on B2B contexts.

In social sciences literature, engagement has been widely studied by educators, psychologists, sociologists and recently by marketers (Brodie *et al.*, 2011). As Hollebeek *et al.* (2022) state, this concept has changed into a major performance metric because has been proved to create a superior firm performance. If we consider engagement in virtual contexts, the concept is more recent. Brodie *et al.* (2013) define engagement as follows.

Consumer engagement in a virtual brand community involves specific interactive experiences between consumers and the brand, and/or other members of the community. Consumer engagement is a context-dependent, psychological state characterized by fluctuating intensity levels that occur within dynamic, iterative engagement processes . . . (p. 107)

From a general view, engagement is formed by three components: the cognitive, emotional and behavioral components (Hollebeek *et al.*, 2014; Harrigan *et al.*, 2017) that can be translated to the virtual context under other denominations as (1) commitment, (2) virality and (3) popularity (Bonsón and Ratkai, 2013). In this sense, this paper follows the proposal by Bonsón *et al.* (2016) and Bronson and Ratkai (2013) because their research method has been successfully used on social networks such Twitter, Facebook and YouTube. Additionally, content analysis studies, such as those of Ponte *et al.* (2015), Bonsón *et al.* (2016), Haro-de-Rosario *et al.* (2018) and Villamediana-Pedrosa *et al.* (2019), confirm that it is flexible and easy to adapt in new contexts of study such as Facebook and Twitter.

2.3 The relationship between value co-creation dimensions and engagement

According to Grisseemann and Stokburger-Sauer (2012), there is a research gap in the relationship between the actions that stimulate or support the co-creation of value and the response in customers. As AbdelAziz *et al.* (2021) state, most of the current studies focused on the value co-creation behavior and output but it is limited the research that focus on what contributes to the customers' engagement for value co-creation intention.

The term engagement by involving customers in value co-creation has received special attention from scientists (Vargo and Lusch, 2008) and have special interest for trade show contexts because, at trade show, the organizer and the exhibitors have been benefited when visitors engage with the fair in a completely comprehensive way (Gopalakrishna *et al.*, 2019).

According to Roberts *et al.* (2014), the motivation to engage in value co-creation is related to the co-creation activities; specifically, different co-creation activities produce a variation in motivations to engage with value co-creation. Literature shows evidence of the influence of value co-creation practices on engagement or any of its dimensions (for example, Carpenter and Krutka, 2015; Fernandes and Remelhe, 2016; Haro-de-Rosario *et al.*, 2018; Hsieh and Chang, 2016; Roberts *et al.*, 2014; Rodesiler, 2015; Xing and Gao, 2018).

According to Ramaswamy (2011), the market should be defined in a new way, as a forum where people outside the companies are part of the value co-creation process of brands. In this scenario, social networks have allowed consumers to exchange experiences that shape the value of co-creation experiences (Alves *et al.*, 2016). As individuals and brands interact and engage, their experiences become the new basis of value co-creation, and this process is facilitated by social networks because they have empowered the people outside the firms (Ramaswamy, 2011). Gummesson and Mele (2010) affirmed that the co-creation of value comes from interactions and the integration of resources. From this point of view, consumers are pleased with social media and desire to interact with brands and, consequently, co-create value (Hsieh and Chang, 2016). In this context, Twitter can be classified as an engagement platform (Fernandes and Remelhe, 2016).

Additionally, social media also offer a perfect environment for the development of engagement (Brodie *et al.*, 2013). In general, customers' interactions on social media can be a source of co-creation and engagement co-creation at the same time (Fernandes and Remelhe, 2016). In this context, co-creation and engagement became in close and related concepts (Chathoth *et al.*, 2016).

In sum and based on previous literature, we hypothesize that co-creation practices (linking and materializing practices) influence engagement (popularity, commitment and virality).

- H. Value co-creation practices (linking and materializing) positively influence on engagement (popularity, commitment, virality and global engagement).

Literature suggests that there is a relationship between actions that can be classified as linking and materializing practices and engagement (Füller, 2006; Wu *et al.*, 2007; Brodie *et al.*, 2013).

First, *regarding linking*, Roberts *et al.* (2014), Fernandes and Remelhe (2016) or Hsieh and Chang (2016) found that firms' activities related to linking practices (co-diagnosis, co-ideation and co-evaluation) work as motivators of engagement. For example, Hsieh and Chang (2016) conducted a study with 300 university students enrolled in a marketing competition in Taiwan, and found that value co-creation tasks/practices affect engagement. These authors explained that some activities (related to linking practices) work as motivators of engagement. In the same way, Haro-de-Rosario *et al.* (2018) and Xing and Gao (2018) found that actions that can be classified as linking practices (co-diagnosis, co-ideation and co-evaluation) influence commitment (an engagement's dimension) and engagement. In addition, other authors found that social interactivity drives engagement (Cheng *et al.*, 2019).

Based on these findings, the following hypothesis is proposed:

- H1. The usage of *linking* practices positively influences engagement.

More specifically:

- H1.1. *Co-diagnosis* positively influences (a) popularity, (b) commitment, (c) virality and (d) global engagement on Twitter.
- H1.2. *Co-ideations* positively influence (a) popularity, (b) commitment, (c) virality and (d) global engagement on Twitter.
- H1.3. *Co-evaluation* positively influences (a) popularity, (b) commitment, (c) virality and (d) global engagement on Twitter.

Second, the literature supports that *materializing practices* can also influence engagement. For example, Roberts *et al.* (2014), Haro-de-Rosario *et al.* (2018) or Xing and Gao (2018) found that firms' activities that can be classified as materializing practices (co-design, co-testing and co-launching) could work as motivators of the engagement. Xing and Gao (2018), in a study with more than 600,000 tweets from development professional and learning communities, found that actions that can be classified as materializing practices (co-design, co-testing and co-launching) influence commitment (or engagement); however, materializing influence more than linking practices. According to these authors, users of these learning communities value principally tweets that focused on actions related to co-design and co-testing practices. In the same line, Carpenter and Krutka (2015) and Rodesiler (2015) state that materializing practices on Twitter engage users of learning communities. In addition, knowledge-based factors positively influenced the implementation of value co-creation practices in companies operating within collaborative steel networks (Fang *et al.*, 2021). Considering the conclusions of the previous research, the following specific hypothesis is proposed:

- H2. The usage of *materializing* practices positively influences engagement.

More specifically:

- H2.1. *Co-design* positively influences (a) popularity, (b) commitment, (c) virality and (d) global engagement on Twitter.
- H2.2. *Co-testing* positively influences (a) popularity, (b) commitment, (c) virality, and (d) global engagement on Twitter.
- H2.3. *Co-launching* positively influences (a) popularity, (b) commitment, (c) virality and (d) global engagement on Twitter.

Additionally, researchers support that some practices are more related to engagement than others. For example, according to Hsieh and Chang (2016), linking is more influential on engagement; but following Xing and Gao (2018), materializing is more influential. This is consistent with the findings of Roberts *et al.* (2014) who think that engagement varies according to the different co-creation practices. Based on these works, the following specific hypothesis is proposed:

- H3. There are *differences* between the *linking* (co-diagnosis, co-ideation and co-evaluation) and the *materializing* practices (co-design, co-testing and co-launching) regarding the production of engagement.

In sum, as Table 5 shows, there are three main hypotheses with 28 specific sub-hypotheses.

3. Method

The present study proposes nonexperimental and ex-post-facto research because variables have already occurred before the researchers have started with the observation (Kerlinger, 1973).

3.1 Data collection, procedure and classification

As stated before, this paper focuses on the relationship between co-creation practices and engagement at international trade show organizer on Twitter. In this sense, data of interest has been collected from the Twitter account @Specialty_Food of the Specialty Food Association (<https://www.specialtyfood.com/>), owner of the Fancy Food Shows (summer and winter versions), which are ranked as the top five Food and Beverage International Trade Show in the United States (<https://www.exponents.com/our-blog/top-15-food-beverage-industry-trade-shows-in-usa/>).

Twitter was selected as social media platform because: (1) it is public, (2) it is possible to investigate each tweet, (3) tweets can be taken simultaneously and (4) it provides enough data for thorough analysis (Leek *et al.*, 2019).

Considering the nature of data and research purpose, content analysis is used, following Krippendorff's (2004) recommendations, dividing our analysis into six stages: design, unitizing, sampling, coding, drawing inferences and validation.

Data were collected through keyhole.co, an accessible freeware in its basic version (Del Vecchio *et al.*, 2018). Additionally, we used the Twitter Premium API through a third-party application named <https://www.followersanalysis.com/>. Finally, all tweets posted in 2019 (in total 1,608) were extracted from the account @Specialty_Food_ on 28th January 2020.

Every tweet was classified by hashtags into coded categories according to the co-creation practices typologies proposed by Marcos-Cuevas *et al.* (2016) that also have been employed by other authors (Fang *et al.*, 2021). The use of hashtags on Twitter is considered a powerful and helpful source of data (Wang *et al.*, 2016). Considering the mentioned above, the hashtags were used for the tweet classification in the present research (Costa *et al.*, 2013).

To classify data into coded categories, a codebook was created. The codebook included the hashtags selected for each practice. The categorization was carried out mostly using hashtags and according to the description of each practice defined in the literature (Marcos-Cuevas *et al.*, 2016). Linking practices were measured through the presence of content, mostly using hashtags, on tweets related to co-ideation and co-evaluation practices. Materializing practices were measured through the presence of content, mostly using hashtags, on tweets related to co-testing, co-design and co-launching practices. Regarding institutionalizing practices, no tweets were found about this kind of practice.

This codebook was tested and considered suitable for the analysis (Cohen's kappa = 0.99, 95% confidence interval). It is used to measure the degree of agreement between two observers. According to the results for Cohen's kappa, there was an almost perfect agreement for the codebook (Landis and Koch, 1977).

The final number of tweets included in the study was 1,608, which were classified into the co-creation practices categories proposed by Marcos-Cuevas *et al.* (2016).

3.2 Variables

3.2.1 Independent variables. As stated before, the co-creation practices were measured using an adaptation of Marcos-Cuevas *et al.* (2016) who proposed to measure three dimensions: linking practices (three items), materializing practices (three items) and institutionalizing practices (one item). This proposal was applied in B2B contexts (Fang *et al.*, 2021; Marcos-Cuevas *et al.*, 2016). As stated before, the codebook included the hashtags selected for each practice.

Linking: was measured *through the presence of content* (mostly using hashtags) on tweets related to co-ideation and co-evaluation practices:

- (1) *Co-ideation practices* (those practices that *generate and suggest ideas*, communicate, share and engage). Thus, in our study, the tweets classified into this category were related principally to *business cases*, the principal label was #12under35.
- (2) *Co-evaluation practices* (those practices that *comment and select ideas*). Thus, the tweets classified into this category were associated with any tweet that include comments about *business ideas*.

Materializing was measured through the presence of content, (mostly using hashtags) on tweets related to co-testing, co-design and co-launching practices.

- (1) *Co-design practices* (those practices that *develop concepts and knowledge*). The tweets classified into this category were related principally to *live and online events*. The principal labels were #FancyFoodShow and #SFABizSummit. In the trade show context, it is carried out the summit of business called SFA Biz Summit, in this event the companies can join the industry experts.
- (2) *Co-testing practices* (those practices that *prototype and improve the offering*, giving feedback). The tweets classified into this category were related principally to *talent*. The principal labels were #SofiAward and #SFALeadershipAwards.
- (3) *Co-launching practices* (those practices that *create and manage information*, advertising, marketing and diffusing information). The tweets classified into this category were related principally to *information*. The principal label was #SFANews.
- (4) *Co-diagnosis practices* (collecting and organizing information for collaborative use). In our study, *there were no tweets* associated with co-diagnosis (a linking dimension).

- (5) *Co-ideation practices* (generating and suggesting ideas, communicating and sharing and engaging). The tweets classified into this category were related principally to business cases, *tweets that included #12under35*.
- (6) *Co-evaluation practices* (commenting and selecting ideas). The tweets classified into this category were associated with any hashtags, but with content related to ideas, comments and sharing of information.

If the tweet contained more than one hashtag or no hashtags, the main topic of the tweet was considered.

3.2.2 *Dependent variables*. This study follows the digital stakeholder engagement measure proposed by [Viglia et al. \(2018\)](#), through two dimensions, the number of favorites and the number of comments in a post. In addition, the study adds one dimension to measure engagement, the number of retweets in a post ([Bonsón et al., 2016](#); [Haro-de-Rosario et al., 2018](#)). Thus, the engagement was measured using the proposal of [Viglia et al. \(2018\)](#) and using an adaptation of the metrics proposed by [Bonsón et al. \(2016\)](#) because it measures engagement on social media and it has been used previously in Twitter’s data analyses ([Bonsón et al., 2016](#); [Haro-de-Rosario et al., 2018](#)). In this sense, engagement was associated with three dimensions (Table 2):

- (1) *Virality*: the number of retweets on posts
- (2) *Popularity*: the number of favorites on tweets.
- (3) *Commitment*: the number of comments on tweets.

4. Analysis and discussion

After collecting the data, the 1,608 tweets were classified into the dimensions of co-creation practices (Table 3) and analyzed as explained in Section 3.

Figure 1 represents the frequencies of the co-creation practices found in the 1,608 tweets. As can be seen, co-launching is the most used practice, followed by co-designed; while co-ideation is the less used practice. If we group the practices into both categories (linking and materializing), it could be affirmed that materializing practices are the most used.

Engagement			
Popularity	P1	Number of favorites	Total number of favorite reactions on Twitter’s post
	P2	$(P1/\text{Number of fans on publication month}) \times 1,000$	Average number of favorites per one thousand fans
Commitment	C1	Number of comments	Total number of comments on Twitter’s post
	C2	$(C1/\text{Number of fans on publication month}) \times 1,000$	Average number comments per one thousand fans
Virality	V1	Number of retweets	Total number of retweets on Twitter’s post
	V2	$(V1/\text{Number of fans on publication month}) \times 1,000$	Average number of retweets per one thousand fans
Global Engagement	GE	$P2 + C2 + V2$	Global Engagement Index

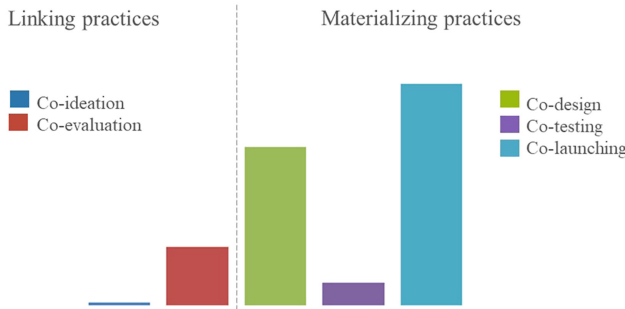
Note(s): Own development

Table 2.
Adaptation of metrics presented by [Bonsón et al. \(2016\)](#) for the measurement of engagement on tweets

Table 3.
Descriptive statistics

	Co-ideation	Co-evaluation	Total for linking	Co-design	Co-testing	Co-launching	Total for materializing	Total
Frequencies	11	204	215	548	79	766	1,393	1,608
<i>Means</i>								
Popularity	0.0346	0.0793*	0.0770	0.1203**	0.0737	0.0413	0.0742	0.0746
Commitment	0.0050**	0.0019	0.0020	0.0035*	0.0007	0.0014	0.0022	0.0022
Virality	0.0148	0.0224*	0.0220	0.0323**	0.0193	0.0152	0.0222	0.0221
Engagement	0.0544	0.1035*	0.1010	0.1561**	0.0937	0.0579	0.0986	0.0989
<i>Standard deviations</i>								
Popularity	0.0440	0.1273	0.1247	0.1697	0.1020	0.0622	0.1244	0.1244
Commitment	0.0164	0.0125	0.0127	0.0149	0.0061	0.0087	0.0115	0.0116
Virality	0.0254	0.0476	0.0467	0.0630	0.0327	0.0346	0.0484	0.0482
Engagement	0.0596	0.1655	0.1621	0.2204	0.1251	0.0804	0.1614	0.1614

Note(s): ** The highest media; *media upper average



Note(s): The linking practices are formed by 1) co-ideation and 2) co-evaluation practices; the materializing practices are formed by 1) co-design, 2) co-testing, and 3) co-launching practices

Figure 1. Frequencies of co-creation practices

Descriptive analyses of the data indicate that the global engagement average is around 0.0989 per thousand fans. Popularity is much higher ($\bar{x} = 0.0746$) than virality ($\bar{x} = 0.0221$) and commitment ($\bar{x} = 0.0022$). Additionally, popularity is the dimension that contributes most to global engagement, followed by virality. These results are in accordance with, for example, Villamediana *et al.* (2019).

Then, an exploratory data analysis was run to check the data distribution. Therefore, the results of the Kolmogorov–Smirnov test show that the p -values are less than 0.01 for engagement and its dimensions. Consequently, the data are not normally distributed. The nonnormality of the data conditioned the rest of the analysis. For this reason, regression analysis with optimal scaling was selected to evaluate the relationships between the predictor variables and the dependent variables. Categorical regression (CATREG) allows that data are not normally distributed (Hartmann *et al.*, 2009).

After the descriptive analysis, we tested the three main hypotheses and their 28 specific sub-hypotheses with a statistical significance level of p -value < 0.05 (α) and a 95% confidence interval. Following previous works (Lee *et al.*, 2010; Villamediana-Pedrosa *et al.*, 2019), regression analyses with optimal scaling (CATREG) were run to test the rest of the specific hypotheses. In total, four regression models were constructed, one for each dependent variable (global engagement and its dimensions: popularity, commitment and virality). Results were statistically significant in every regression (considering p -value < 0.05) (Table 4).

In the first model, related to *popularity*, the results reveal a highly significant and moderate correlation ($R = 0.286$) between popularity and the co-creation practices (the linking practices formed by co-ideation and co-evaluation; and the materializing practices formed by co-design, co-testing and co-launching). In the model, approximately 8% of the variance in popularity is

Dependent variable	R	R^2	Group comparison		F	β	Coefficients		
			R Adjusted	p . Error			e	df	F
Popularity	0.286	0.082	0.080	0.918	35.807**	0.286	0.023	4	152.583**
Commitment	0.087	0.008	0.005	0.992	3.046*	0.087	0.024	4	13.163**
Virality	0.147	0.022	0.019	0.978	8.846**	0.147	0.025	4	33.548**
Global Engagement	0.269	0.072	0.070	0.928	31.167**	0.269	0.024	4	123.714**

Note(s): ** p -value < 0.01 ; * p -value < 0.05 ; predictor variable: co-creation practices

Table 4. Regression analyses with optimal scaling

Table 5.
Hypotheses tests

Hypotheses	(a) Popularity	(b) Commitment	(c) Virality	(d) Global engagement
<i>Linking influences H1</i>				
(1) Co-ideation	H1.1.a) Rejected	H1.1.b) Accepted	H1.1.c) Rejected	H1.1.d) Rejected
(2) Co-diagnosis	H1.2.a) Rejected	H1.2.b) Rejected	H1.2.c) Rejected	H1.2.d) Rejected
(3) Co-evaluation	H1.3.a) Accepted	H1.3.b) Rejected	H1.3.c) Accepted	H1.3.d) Accepted
<i>Materializing influences H2</i>				
(1) Co-design	H2.1.a) Accepted	H2.1.b) Accepted	H2.1.c) Accepted	H2.1.d) Accepted
(2) Co-testing	H2.2.a) Rejected	H2.2.b) Rejected	H2.2.c) Rejected	H2.2.d) Rejected
(3) Co-launching	H2.3.a) Rejected	H2.3.b) Rejected	H2.3.c) Rejected	H2.3.d) Rejected
<i>Differences H3</i>				
	H3.a) Accepted	H3.b) Accepted	H3.c) Accepted	H3.d) Accepted

explained by the co-creation practices: R^2 adjusted = 0.080, $F(0.918) = 35.807$, p -value < 0.01. According to these results, the co-creation practices explain the popularity of Twitter.

In the second model, related to *commitment*, the outcomes show a significant and low correlation ($R = 0.087$) between commitment and the co-creation practices (the linking practices formed by co-ideation and co-evaluation; and the materializing practices formed by co-design, co-testing and co-launching). In the model, approximately 0.5% of the variance in commitment is explained by the co-creation practices: R^2 adjusted = 0.005, $F(0.992) = 3.046$, p -value < 0.05. According to these results, the co-creation practices explain the commitment on Twitter.

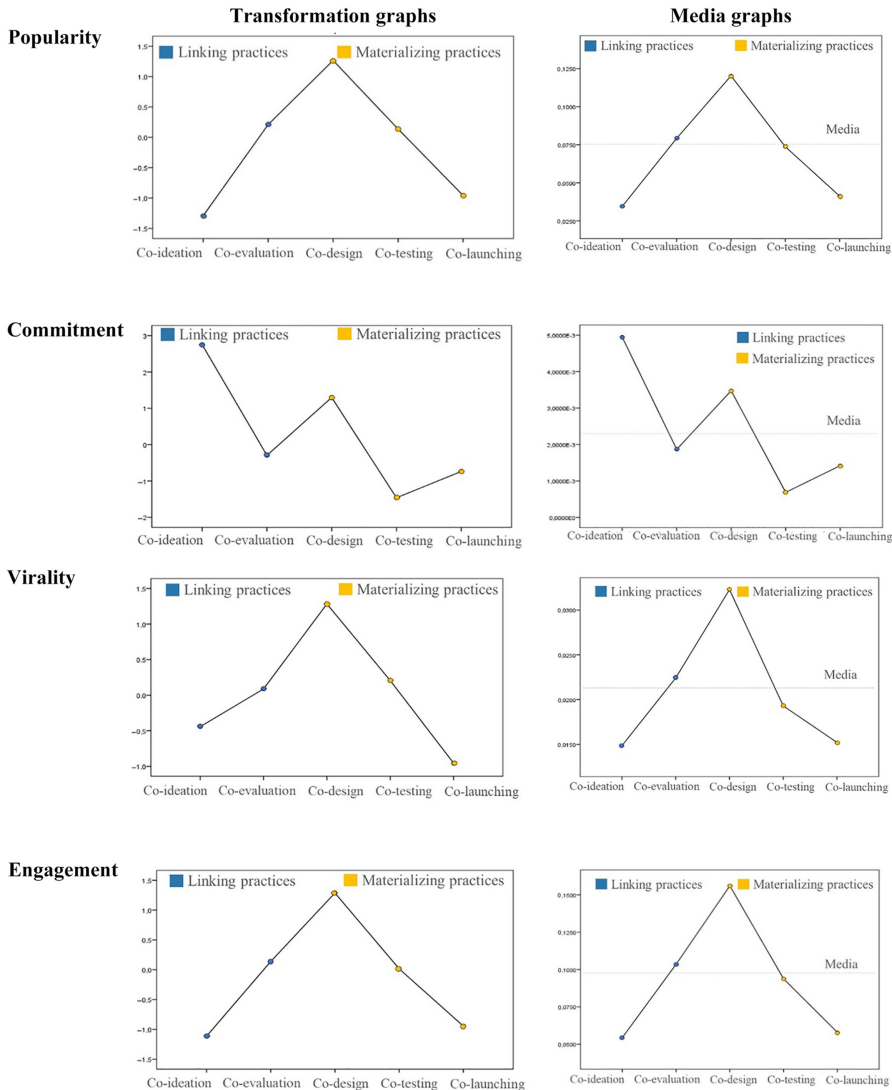
In the third model, related to *virality*, there is a highly significant and low correlation ($R = 0.147$) between virality and the co-creation practices (the linking practices formed by co-ideation and co-evaluation; and the materializing practices formed by co-design, co-testing and co-launching). In the model, approximately 1.9% of the variance in virality is explained by the co-creation practices: R^2 adjusted = 0.019, $F(0.978) = 8.846$, p -value < 0.01. According to these outcomes, the co-creation practices explain the virality on Twitter.

In the last model, related to *global engagement*, the outcomes reveal a highly significant and moderate correlation ($R = 0.269$) between engagement and the co-creation practices (the linking practices formed by co-ideation and co-evaluation; and the materializing practices formed by co-design, co-testing and co-launching). In the model, approximately 7% of the variance in engagement is explained by the co-creation practices: R^2 adjusted = 0.070, $F(0.928) = 31.167$, p -value < 0.01. According to these results, the co-creation practices explain the global engagement on Twitter.

These findings provide evidence that supports our general hypothesis: value co-creation practices (linking and materializing) positively influence engagement (popularity, commitment, virality and global engagement). Therefore, *the general hypothesis (H) is supported*.

Following further, to take the decision to accept or reject the three main hypotheses and their 28 specific sub-hypotheses, we analyzed the transformation and the media graphs (Figure 2).

Regarding the *liking practices (H1)*, *co-ideation* (a linking practice) is the most positively influential practice on commitment. According to these findings, the usage of co-ideation practices influences positively commitment on Twitter. It means that the specific hypothesis H1.1.b should be accepted. Additionally, *co-evaluation* (linking practices) is the second most positively influential practice on popularity, virality and global engagement. Considering that the media of co-evaluation is upper the average of popularity, virality and global engagement, the usage of co-evaluation practices influences positively on popularity, virality



Note(s): The discontinued line on media graphs shows the total media for the data

Figure 2.
Transformation and
media graphs
categorized according
to the co-creation
practices

and global engagement on Twitter. Thus, the specific hypotheses H1.3.a, H1.3.c and H1.3.d have been accepted. These findings are slightly like those reported by Fernandes and Remelhe (2016), Füller (2006), Hsieh and Chang (2016) and Wu *et al.* (2007).

Regarding the *materializing practices*, *co-design* (a materializing practice) is the most positively influential practice on popularity, virality and global engagement. Thus, the usage of co-design practices influences positively on popularity, virality and global engagement on Twitter. Therefore, hypotheses H2.1.a, H2.1.c and H2.1.d are supported. Additionally, co-design is also the second positively most influential practice on commitment. Considering

that the media of co-design is upper the average of commitment, the usage of co-design practices influence positively commitment on Twitter. Thus, we support the specific hypothesis H2.1.b. These results are consistent with those found by other researchers (i.e. Carpenter and Krutka (2015) or Haro-de-Rosario *et al.* (2018)).

To test H3, we run a Kruskal–Wallis Test to check if there are differences between the co-creation practices regarding the production of engagement and its dimensions (McKnight and Najab, 2010). The results of this test show that the p -values are less than 0.05 for engagement and its dimensions. Therefore, there are differences between the co-creation practices as it was expected. It means that some co-creation practices generate more engagement than others. Consequently, H3.a, H3.b, H3.c and H3.d have been accepted. Finally, we can affirm that there are *differences* between the *linking* (co-diagnosis, co-ideation and co-evaluation) and the *materializing* practices (co-design, co-testing and co-launching) regarding the production of engagement. In general, this finding is consistent with previous studies (Hsieh and Chang, 2016; Xing and Gao, 2018).

Regarding the 28 specific hypotheses, in total 12 of the 28 specific hypotheses were confirmed as can be seen in Table 5. The main hypotheses H1 and H2 are partially supported and H3 is supported. The results were interpreted considering the nonlinear relationships between value co-creation practices and engagement.

According to the 28 specific sub-hypotheses accepted (Table 5), we can state the following. First, there are differences between the linking and materializing practices influential on popularity, commitment, virality and global engagement on Twitter. Second, the usage of co-ideation practices positively influences commitment on Twitter. Third, the usage of co-evaluation practices positively influences popularity, virality and global engagement on Twitter. Fourth, the usage of co-design practices influences positively popularity, commitment, virality and global engagement on Twitter. Finally, we can affirm that messages related to business cases (the content classified as co-ideation) produce more commitment than other practices. It means that this kind of content increases participation on social media.

5. Conclusions, implications, limitations and future lines of research

5.1 Conclusions

The aim of this research was to analyze the influence of value co-creation practices on engagement at ITS organizer association on Twitter. From a general point of view, the contributions of this study are related, on the one hand, to the contribution of more research on these practices in B2B contexts (Frow *et al.*, 2016), and on the other hand, to the analysis of the relationship between value co-creation practices and engagement in social networks (Fernandes and Remelhe, 2016). In specific terms, the main contributions to the scientific literature are as follows:

This research highlights the relevance of value co-creation practices (co-ideation, co-evaluation, co-design, co-testing and co-launching) in the production of engagement in a social network such as Twitter. The findings show that value co-creation practices positively influence engagement and its dimensions (popularity, engagement, virality and global engagement) in B2B contexts. Furthermore, the study confirms the existence of differences between linking and materializing practices in terms of their engagement production.

Moreover, the study contributes to the understanding of value co-creation practices in the context of social media by providing answers related to the identification, the use of these practices by B2B actors and the effect on engagement on Twitter. Overall, these findings demonstrate the usefulness of value co-creation practices in generating engagement in B2B contexts.

The proven relationship between value co-creation practices and engagement, a key variable in social media platforms such as Twitter, is consistent with the alternative logic of value creation (Ramaswamy, 2011). This approach considers interactions as a source of value co-creation thanks to the collaborative and dynamic environment of social networks.

Considering the dimensions of engagement, materializing practices produce more popularity, virality and global engagement than linking practices, while linking practices produce more engagement (a dimension of engagement, measured by the number of comments on tweets) than materializing practices. More specifically, firstly, we observed that co-design and co-evaluation practices (materializing practices) are the practices that produce the most engagement on a social network such as Twitter. In other words, tweets that included live events and online events where concepts and knowledge are developed (co-design practices) together with tweets that included comments about business ideas (co-evaluation practices), are the value co-creation practices that generate the most popularity, virality and global engagement on the Twitter social network.

Secondly, we observed that the practice of co-ideation (linking practice) is the practice that produces the most commitment, a dimension of engagement that was measured through the number of comments on tweets. In other words, co-ideation practices produce more comments than other practices. In this case, the tweets that included business cases generated more comments than the other practices.

5.2 Implications

The managerial implications of this study allow us to suggest to marketing directors and managers of companies that organize trade fairs or B2B events, the use of co-design, co-evaluation and co-ideation practices, prioritizing them over others, given that they are powerful motivators of engagement and its dimensions on Twitter. Therefore, it is suggested to create publications that are framed within co-design, co-evaluation and co-ideation value-creation practices. This will foster engagement through: virality (retweets), popularity (favorites), commitment (comments), and global engagement.

We recommend, in order of importance, to enhance co-creation practices aimed at: (1) developing concepts and knowledge in live and online events (co-design practices), (2) sharing valuable business ideas (co-evaluation practices) and (3) sharing business cases (co-ideation practice).

From a general overview, to generate more engagement on social media in B2B contexts, it is recommended to prioritize posts that incorporate events based on collaborative and dynamic human interactions. Research has shown that, in the case of Twitter, tweets that post live events and online events, where concepts and knowledge are developed (co-design practices), produced the most engagement.

5.3 Limitations and further research

In our study, the data were carefully collected, coded and analyzed. Our findings are valid, and our research can be replicated by other authors. However, there are also limitations in our research. The main limitation is that only one case, one social network, in a single country was analyzed.

Consequently, the findings should not be generalized to contexts with different settings from the one studied. We suggest the development of new studies applied across different sectors, platforms and countries to confirm the effect of value co-creation practices on engagement.

Additionally, there are low percentages of explained variance in the results, as it is usual in social sciences studies (Attewell *et al.*, 2015). This means that engagement and its dimensions are also explained by other variables, not just co-creation practices. The influence of other

variables on engagement in B2B contexts could be analyzed in new studies such as the brand image (Islam and Rahman, 2016). It would also be interesting to study how other variables are influenced by the co-creation practices. Finally, it can be studied as the usage of co-creation practice in other ITS.

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