How Do Social Media Increase Firm Performance? 
Entrainment of Innovation to Contention

Completed Research Paper

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ABSTRACT

In this theoretical paper, we propose a mechanism through which social media may enhance firm performance. To do so, we tap into a time lens, entrainment—the alignment of the timing and pace of a cyclic activity with those of another activity. We then argue that firms with high social media capabilities can more easily entrain their innovation to the speed, type, amount, and range of contention emanating from external stakeholders. We further argue that firms that entrain their innovation to the contention can increase their performance.

Keywords

Social media, capabilities, firm performance, entrainment, innovation, contention, STAR framework
INTRODUCTION

Corporate use of social media has been increasing (Culnan, Mchugh, and Zubillaga 2010). There is consequently ongoing interest in examining business impacts of social media (e.g., Choi, Im, and Kim 2011; Majchrzak, Wagner, and Yates 2013). However, theorizing effects of social media use on organizational outcomes is still at its nascent stage (Larson and Watson 2011; Urquhart and Vaast 2012). In this paper, we attempt to theorize social media impacts on firm performance by focusing on social media’s effects on firm innovation initiated by the contention emanating from external stakeholders (e.g., regulators, activists, NGOs). Specifically, drawing upon management and sociology literatures, we argue that social media can increase firm performance by enhancing alignment of firms’ innovation with contention from external stakeholders.

To investigate this effect of social media, we use the theoretical lens of entrainment. Entrainment is defined as the alignment of the timing and pace of a cyclic activity with those of another activity (Ancona and Chong 1996). By emphasizing alignment of timing and tempo of business activities, entrainment can proffer novel theoretical as well as practical explanations for the individual-, team-, and organizational-level effectiveness (Ancona, Goodman, Lawrence, and Tushman 2001; Pérez-Nordtvedt, Payne, Short, and Kedia. 2008). Through the entrainment lens, we attempt to address the following two questions:

(1) How do social media enhance firms’ entrainment of innovation to contention?
(2) How does the entrainment of innovation to contention increase firm performance?

Addressing these two questions bridges gaps in literature. First, while evidence suggests that contention emanating from external stakeholders increases as firms’ innovative activities increase, and decreases as firms’ innovative activities decrease in the social media era (Kim 2012), we do not know how external contention impacts firm innovation in the social media era. Second, past research examined mainly the entrainment of the amount of contention to the amount of innovation, which is obviously not the only way in which the two cycles may be entrained. Third, past research examined entrainment of contention to innovation at the sector level (Kim 2012). Firms are differentially enabled by their social media capabilities to manage the relationship between contention and innovation cycles.

The goal of this paper is therefore to examine the role of social media and their impact on firm performance by focusing on diverse forms of entrainment of innovation to contention—i.e., how social media affect the way diverse innovation cycles align with their matching contention cycles and how this alignment affects firm performance.

By accomplishing this goal, we make three main contributions. First, we identify a mechanism through which social media have positive effects on an important organizational effectiveness measure: firm performance. In doing so, we add to our developing knowledge on the theory about business effects of social media (Larson and Watson 2011). Second, we identify a noteworthy determinant of entrainment to the contention cycle: social media capabilities. Third, we extend entrainment theory by applying it to innovation and contention cycles and by developing the STAR framework.

To make these contributions, we first briefly review the literatures on contention, innovation, entrainment, and social media. We then propose our theoretical model along with propositions. Finally, we conclude with discussion and conclusion.

CONTENTION AND INNOVATION

Contention is defined as episodic, public, collective interaction among makers of claims and their objects when (a) at least one organization is a claimant, an object of claims, or a party to the claims and (b) the claims would, if realized, affect the interest of at least one of the claimants (McAdam, Tarrow, and Tilly 2001). Examples of contention are petition, protest, and opposition. The frequency and form of contention have been found to cycle over time (Koopmans 1993, 2004; Tarrow 1993). Social and political issues that engender those cycles include demographic changes, economic downturns, heightened conflict, appearance of new social movement organizations, invention of new forms of collective action, and creation of new master frames of meaning (Tarrow 1993).

We define innovation as products, processes, practices, or organizational structures that are new to the particular organization and are intended to further organizational goals (Birkinshaw, Hamel, and Mol. 2008; Damanpour and Evan 1984). Like contention, innovation shows its own chronological cycles (Van de Ven, Polley, Garud, and Venkataraman 1999). For example, innovation activities increase during the discontinuous innovation era and decrease during the subsequent incremental innovation era (Anderson and Tushman 1991; Tushman, Anderson, and O’Reilly 1997).

In the next section, we discuss why examining cycles of activities are important by explicating the notion of entrainment.
ENTRAINMENT

Entrainment is a theoretical lens focusing on time (Ancona and Chong 1992, 1996; Ancona et al. 2001; McGrath and Rotchford 1983). It refers to the alignment of the timing and pace of a cyclic activity with those of another activity (Ancona and Chong 1996). Entrainment particularly emphasizes the “timing” and the “pace” of an activity, or change, in relation to another activity over time (Perez-Nordtvedt et al. 2008). Consequently, the entrainment lens informs managers of “when” they should respond to change, adding to the insights offered by conventional theoretical lenses such as the strategic lens; the strategic lens traditionally underscores “what” or “how”, not “when” (Ancona et al. 2001). Figure 1 depicts an example of entrainment.

**Figure 1 Entrainment at Disneyland** (Source: Ancona and Chong 1993)

In this figure, the thin black line represents the number of attendees at Disneyland (in thousands), and the thick black line denotes the number of part-time employees (in hundreds). Those two lines show strong entrainment; they move along with each other. Part-time employees increase and decrease when attendees increase and decrease. This demonstrates good timing and pace and thus strong entrainment. However, the red line, which represents the number of part-time employees too, shows the pattern where part-time employees seem to increase and decrease independent of the number of attendees. This exemplifies poor entrainment.

What we can learn from this Disneyland example is that Disneyland managers should entrain the part-time employee cycle to the attendee cycle. This entrainment leads to, at the very least, survival of the organization and to higher financial performance (Ancona and Chong 1993; Perez-Nordtvedt et al. 2008).

The same logic applies to the entrainment of innovation to contention. This entrainment, which we also call innovation-contention entrainment, reflects the extent to which the timing and pace of the occurrence of firm innovation are aligned with the timing and pace of contention across time. If managers entrain their innovation to contention, then the performance of their firm is likely to increase (Perez-Nordtvedt et al. 2008).

At this stage, however, we have little collective knowledge about how the innovation-contention entrainment transpires. We argue that social media can play an integral part in this entrainment. In the next section, thus, we briefly review the relevant social media literature.

SOCIAL MEDIA

Social media are defined as a group of Internet-based applications in which users participate and on which users collaborate (Kaplan and Haenlein 2010). They include blogs, wikis, and social networking sites (Asur and Huberman 2010; Kane, Fichman, Gallaugher, and Glaser 2009). Companies use social media to monitor and interact with their environment (Larson and Watson 2011; Qualman 2009). As open systems (Katz and Khan 1976), organizations do take into consideration external demands that they noticed when monitoring and interacting with their environment (Meyer and Rowan 1977; Peffer and Salancik 1978).

Prior research demonstrated that social media influences firms’ disclosures of bad news and social media-based disclosures pre-empt negative market reactions to the bad news (Xu and Zhang 2009). Research also highlighted the need for firms to
engage in environmental scanning of external stakeholder contention via social media (Yang, Li, and Kiang 2011). Earlier work also suggests that the social media era significantly increases the entrainment of contention to firm innovation (Kim 2012). These studies, however, left unanswered significant questions behind.

For example, while evidence suggests that contention emanating from external stakeholders increases as firms’ innovative activities increase, and decreases as firms’ innovative activities decrease in the social media era, we do not know how external contention impacts firm innovation in the social media era. Moreover, past research mainly focused on the entrainment of the amount of contention to the amount of innovation, which is not the only way in which the two cycles can be entrained. Furthermore, past research examined entrainment of contention to innovation at the sector level. Firms are differentially enabled by their social media capabilities to manage the relationship between contention and innovation cycles. To address these gaps, we next propose at the firm level the entrainment STAR framework that focuses on the entrainment of innovation to contention.

THEORETICAL MODEL

Figure 2 depicts our theoretical model.

![Figure 2 Theoretical Model: The STAR Framework](image)

To examine the entrainment of innovation to contention, we propose the STAR framework. STAR stands for Speed, Type, Amount, and Range. The STAR framework consists of (1) the entrainment of the speed of innovation to the speed of contention (2) the entrainment of the type of innovation to the type of contention (3) the entrainment of the amount of innovation to the amount of contention, and (4) the entrainment of the range of innovation to the range of contention. The proposed STAR framework is exploratory by nature. However, it should be noted that entrainment research is still at its nascent stage, lacking analytical frameworks or subtheories (Ancona et al. 2001; Pérez-Nordtvedt et al. 2008). In fact, we believe our STAR framework can be an important contribution of our paper. Table 1 provides the definitions of constructs of the STAR framework.
### Table 1 Definitions of Constructs in the STAR framework

<table>
<thead>
<tr>
<th>Construct</th>
<th>Definition</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Speed</td>
<td>How fast contentions (e.g., protest, petition) gain approval among stakeholders</td>
<td>How fast the corresponding innovations are completed</td>
</tr>
<tr>
<td>Type</td>
<td>What types of contentious elements (e.g., energy technologies) are featured in contentions</td>
<td>Whether corresponding types of innovations are completed</td>
</tr>
<tr>
<td>Amount</td>
<td>How many contentions are created</td>
<td>How many of the corresponding innovations are completed</td>
</tr>
<tr>
<td>Range</td>
<td>How widespread contentions are across regions</td>
<td><em>How radical innovations are</em></td>
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*Radicalness of innovation can correspond to the range of contention as a widespread contention tends to mean that most stakeholders do not generally approve the firm’s current approach of doing business, requesting a dramatic change. Moreover, the impact of radical innovation tends to be broader than incremental innovation (Henderson and Clark 1990).*

### Social Media Capabilities

We draw upon the literature on affordances to conceptualize firms’ social media capabilities. Affordances (Gibson 1977) refer to “whatever it is about the environment that contributes to the kind of interaction that occurs” (Greeno 1994, p.338).” When there is any interaction between an agent (e.g., person) and an entity (e.g., social media), affordances of the entity in conjunction with the agent’s ability to utilize the affordances enable the interaction (Gibson 1977).

Social media have affordance for visibility, interactivity, and persistence (Treem and Leonardi 2012; Davern, Shaft, and Teeni 2012). By affording visibility, social media enable users to make visible their behaviors, knowledge, and connections that were once invisible, or at least very hard to perceive (Treem and Leonardi 2012). By affording interactivity, social media enable users to establish and maintain connections with individuals, groups, organizations, and social media contents (Davern et al. 2012; Treem and Leonardi 2012). Finally, by affording persistence, social media enable users to keep their messages on social media almost indefinitely (Treem and Leonardi 2012).

Social media, then, can increase firms’ awareness of external contention that might go unnoticed otherwise. Social media’s affordances for interactivity enable firms and stakeholders to form closer relationships (Gallaugher and Ransbotham 2010; Larson and Watson 2011), where more detailed information, such as detailed complaints, may be exchanged. Moreover, social media’s affordances for visibility and interactivity allow stakeholders to obtain and share innovation-related information that would have been difficult to come by, which enables stakeholders to attack or help firms with the information (Kim and Miranda 2011). Furthermore, such information can also be diffused at a faster rate inside and outside firms due to the interactivity and visibility (Kane et al. 2009; Treem and Leonardi 2012). As a consequence, through social media, firms can notice and be informed of negative effects of their innovation more quickly.

However, although social media provides these affordances, firms (i.e., agents) should be able to take advantage of those affordances. As social media further enable firms to sense external contentions and to process them more efficiently, firms with good social media capabilities are more likely to entrain their innovation to contention. Moreover, it should also be noted that a good amount of contention is raised and carried out in online petition sites—a form of social media. Thus, if firms regularly monitor social media sites and interpret the contents on those sites (i.e., an evidence of good social media capabilities), then those firms are likely to become well-informed about ongoing contentions. These firms are then more likely to take actions to deal with rising and existing contentions (Crossan, Cunha, Vera, and Cunha 2005). Similarly, effective usage of internal social media (e.g., chatter) can promote communication and knowledge-sharing amongst organization members, in effect making timely innovation more possible (Crossan et al., 2005). Taken together, firms with high social media capabilities are likely to entrain their innovation to the speed, type, amount, and range of contention coming from external stakeholders. We therefore propose:

**Proposition 1a:** Firms with high social media capabilities will more entrain their innovation to the speed of external contention.

**Proposition 1b:** Firms with high social media capabilities will more entrain their innovation to the type of external contention.

**Proposition 1c:** Firms with high social media capabilities will more entrain their innovation to the amount of external contention.
Proposition 1d: Firms with high social media capabilities will more entrain their innovation to the range of external contention.

From Entrainment to Firm Performance

The reward of entrainment has been documented at diverse levels of research. Individual and group level research demonstrates empirical support for the relationship between entrainment and performance (e.g., Harrison, Mohammed, McGrath, Florey, and Vanderstoep 2003; Labianca, Moon, and Watt 2005; Jansen and Kristof-Brown 2005). Similarly, at the firm level, researchers show the benefits of entrainment. Eisenhardt (1989) shows that organizational performance in technologically fast-changing environments is associated with rapid decision making (i.e., speed of entrainment). Khavul, Pérez-Nordtvedt, and Wood (2010) demonstrate that the entrainment to partner firms’ cycles is an important moderating mechanism for high performance. Ancona et al., (2001) show that when firms entrain innovation to the type of technological change in their environment, their performance increases. Pérez-Nordtvedt et al. (2008) in their conceptual work argue that entrainment to external environmental cycles will lead to higher firm performance. The main point of these firm-level entrainment studies is that when firms entrain to their key environmental factors, their performance tends to increase.

Likewise, when firms entrain their innovation to the speed, type, amount, and range of contention coming from external stakeholders, their performance is liable to increase. First, such entrainment means that the company is producing products, services, or practices that fit current external demands or requests. Such response is likely to lead to higher sales (Morgan, Vorhies, and Mason 2009). Second, firms responding to external contention can maintain good corporate image amongst stakeholders. This at least prevents boycotting of their products. Third, conforming to external environments confers legitimacy to the conforming firms (Rowan 1982). Firms with legitimacy enjoy more resources as well as better reputations (Deephouse and Suchman 2008). Finally, entraining to external contention often means responding to corporate social responsibility because many contentions are about corporations not behaving in a socially responsible way (Soule 2009). The corporate social responsibility literature suggests that when companies are responsive to social problems, their financial performance tend to improve even if those problems do not necessarily concern with the firms (Udayasankar 2008).

The foregoing argument suggests that firms that entrain their innovation to the speed, type, amount, and range are likely to experience increasing performance. Therefore, we propose the following:

Proposition 2a: Entrainment of innovation to the speed of contention will increase performance.

Proposition 2b: Entrainment of innovation to the type of contention will increase performance.

Proposition 2c: Entrainment of innovation to the amount of contention will increase performance.

Proposition 2d: Entrainment of innovation to the range of contention will increase performance.

DISCUSSION AND CONTRIBUTION

Drawing upon IS, management, and sociology literatures, we have proposed that social media increase firm performance by enhancing entrainment of firms’ innovation to external contention. In doing so, we have made four main contributions.

First, we have identified a mechanism through which social media have positive effects on an important organizational outcome: firm performance. By putting time to the forefront through entrainment in the STAR framework, we have proffered different and fined-grained explanations for firm performance. By doing so, we have added to our developing knowledge on the theory about the organizational effects of social media (Larson and Watson 2011). This is an important contribution to the IS literature in that one of the enduring questions in the IS field is how to accomplish competitive advantage using IT (Pavlou and El Sawy 2006). Moreover, we focus on a more fined-grained IT construct, social media. In doing so, we answer the call by Jasperson, Carter, and Zmud (2005) for going beyond the black box approach toward IT constructs.

Second, we have identified a noteworthy determinant of entrainment to the contention cycle: social media capabilities. Why some organizations can readily entrain to their environmental cycles while some cannot has been an enduring issue (Khavul et al. 2010; Pérez-Nordtvedt et al. 2008). Our study has addressed this issue by proposing and examining social media capabilities as an important determinant of the entrainment of innovation to contention. Examining social media capabilities is especially important in modern days in that many contemporary firms are widely using or try to benefit from social media.

Third, there have been calls for the incorporation of temporality into organizational research (Ancona et al. 2001; George and Jones 2000; McGrath and Rotchford 1983; Mitchell and James 2001). Yet, temporal lenses have been largely neglected, particularly at the macro level. Most importantly, time lenses can provide different perspectives and managerial solutions on firm structure, performance, and survival (Ancona et al. 2001; Ployhart and Vandenberg 2010; Waller 1999). For example,
the time lens applied in this paper, entrainment, suggests the importance of the timing and pace of firms’ reaction to contention. It should be noted that this insight is hardly to be gained when the three predominant theoretical lenses are applied (Ancona et al. 2001): the strategic lens, the political lens, and the cultural lens. To illustrate, the strategic lens would emphasize organizational structure that fits the environment as a response to change. The political lens would underscore power, influence, conflict, and network for successful adjustment. The cultural lens would focus on the alignment of norms and values in successful collective reaction and thus higher firm performance. As the foregoing argument suggests, the temporal lens could enrich our thinking on organizational phenomena.

Finally, practically speaking, companies will be informed of how their reactions to external contentions impact their performance. We maintain that firms that entrain to external contentions through innovation will continuously prosper.

CONCLUSION

In this paper, we have proposed a mechanism through which social media positively impact a crucial organizational outcome, firm performance. To do so, we have tapped into the management literature for innovation and entrainment and the sociology literature for contention. We have argued that firms that have high social media capabilities are more likely to entrain their innovation to the speed, type, amount, and range of contention (the STAR framework). We then further proposed that this entrainment leads to higher firm performance. We hope that we have added to our existing body of knowledge on entrainment, contention, and the organizational effect of social media.
REFERENCES


