Twitter adoption and use by SMEs: An empirical study

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Abstract

Social media tools are used by firms to create and capture business value. In this study, we synthesize emerging literature on social commerce, social media, and the diffusion of innovation to identify the role that organizational, managerial and environmental characteristics of SMEs play in the adoption of Twitter. To test the model, we administered a survey to 453 SME managers from the United States, the United Kingdom, Australia and India. The results of logistic hierarchical regression indicate that firm innovativeness, age and geographic location have a significant impact on Twitter adoption by SMEs. Implications for research and practice are discussed.

1. Introduction

Social media tools such as Facebook and Twitter have emerged as new channels which are constantly used by firms to create and capture business value [1]. Prominent advantages of social media tools include: (a) their capacity to enable improved consumer shopping experiences, by leveraging outputs such as buying-experience information among friends and relatives, and real-time sharing of purchase activities with friends before taking final purchasing decisions [2, 3]—all of enables such channels to play a critical role in the business environment by attracting and retaining online consumers [4]; (b) their ability to allow a given organization to communicate and collaborate not only with its customers, but also with its suppliers [1, 5]; and (c) their impressive capacity to establish relationships of trust among supply chain partners, as well as to identify prospective business partners in terms of B2B selling [6]. One researcher [7] states, “Social media are changing the way companies can interact and engage with their customers, as well as the way they can interact and collaborate internally with their employees. Social media initiatives have resulted in a restructuring of the marketing function, as well as the way the companies think about their relationships with customers, business partners and internal employees” (p. 187).

Currently, Twitter is the fastest growing Web 2.0 technology when compared to other micro-blogging platforms [8]. In addition, Twitter offers several advantages when compared to other social media tools (e.g. Facebook). Twitter can be used to capture an emotional roller coaster in order to predict the ups and downs of the stock market [9]. Also, it is very easy to gain followers on Twitter, and therefore engage with them before even becoming their friends [10]. These advantages contribute to Twitter’s popularity. For example, twitter.com is currently ranked the 291st most visited website in the UK, where the Internet traffic has increased by 974% from 2008 to 2009. Comparatively, the Web traffic went up to about 517.9% [11] in Australia during the same period. In the USA, the awareness of Twitter went from 5% among Americans aged 12+ in 2008 to almost 87% in 2010 (as compared with Facebook, 88%). More importantly, about 51% of active American Twitter users follow companies, brands or products on social networks, thereby positioning Twitter as an important marketing tool [12].

The popularity of Twitter is also evident through its innovative use by some firms. For example, [13] examine recruitment using Twitter compared to other recruitment methods. The authors found that online recruitment using social media platforms like Twitter is not only a viable hiring mean, but also an important factor in the understand of emerging Internet-based phenomena. While reviewing the use of Twitter in the last Singaporean elections, [14] look at whether the messages posted online reflected the opinions of the potential voters. Then, drawing on Twitter’s data obtained during the official campaign period of the 2011 Singapore General Election, they tested the predictive power of tweets in forecasting the election results. The authors found that during elections the Twittersphere may represent a rich source of data for gauging public opinion and that the frequency of tweets mentioning names of political parties, political candidates and contested constituencies could be used to make predictions about the share of votes at the national level.

Even if there is an increased number of articles on the adoption and use of Twitter by large organizations seeking business value creation [15-17], little has been written about Twitter adoption and use by SMEs – considered as “the engine of the economies of many countries” (p. 241)
[18] – for the sake of improved business operation optimization. In fact, SMEs are at the core of economic growth in many western countries [19, 20]. For example, they represent roughly 99% of firms in the European Union, generating approximately 70% of all employment in the Union [20]. In the U.S., SMEs generate about 39% of the country’s gross national product (GNP) and produce almost the two-thirds of jobs [18]. Moreover, early studies on IT adoption and use reveal that SMEs are far less likely to use emerging technologies than larger organizations [21]. In short, “SMEs are failing to make good use of IT” (p. 697)[22].

Therefore, this research is an initial effort towards bridging the existing knowledge gap in the literature. More specifically, this research examines the following research question: What role do the organizational, managerial and environmental characteristics of SMEs play in the adoption of Twitter?

To address this question, we draw on the emerging literature on social commerce, social media, and the diffusion of innovation theory, with an emphasis on the adoption and use of innovation by SMEs. The remainder of this paper is structured as follows: Section 2 presents the conceptual model and the hypotheses. Section 3 discusses the research methodology for this study. Section 4 presents the results. Section 5 presents the discussion. Section 6, which is the conclusion, ends the article.

2. Conceptual Development

This paper studies the role of organizational, managerial and environmental characteristics of SMEs in the adoption of Twitter. The purpose of this study is to explore the profile of the SMEs involved in social media initiatives for organizational transformation. Drawing on the emerging literature on social commerce, social media, and the diffusion of innovation theory —with emphasis on the adoption and use of innovation by SMEs—, we present a model which is based on the conceptual and empirical determinants of the adoption of Twitter.

With regard to the adoption and use of an innovation, it is true that the dominant paradigms of the diffusion of innovation theory have identified a set of characteristics that may influence such an adoption and use in terms of: innovation characteristics (e.g., relative advantage, compatibility, complexity), organizational characteristics (e.g., organizational readiness, organizational size, organizational innovativeness) and environmental characteristics (e.g., intensity of competitive pressure, position in the business network, geographic position of the firm) [23, 24]; however, an increased number of scholars argue that such dominant paradigms may not be appropriate to study all types of innovations because of “the fundamental differences between the different types of innovations” (p. 3) [25]. If we view Twitter as a technological innovation, its characteristics such as real-time sharing of customers choices, active engagement of customers with firm products and brands, open access to Twitter users information and suggestions, considerably differentiate the technology from the existing ones, especially in regards to communication and engagement with the customers, suppliers and supporting the operations of the firm. Therefore, we follow an approach used by [25] and limit our study to a set of determinants related to the firm’s organizational characteristics (e.g., firm innovativeness, firm size), manager characteristics (e.g., age, gender, education) and environmental characteristics (e.g., firm geographic location). More precisely, we evaluate how the adoption of Twitter is directly influenced by the adopting firm’s innovativeness and size (organizational characteristics), the age, gender, education of executives (manager characteristics) and the firm’s geographic location, etc. (environmental characteristics) (Fig. 1).

![Fig. 1 Proposed conceptual model](image)

2.1 Organizational Characteristics: Importance of Firm Innovativeness and Size

Prior studies on IT adoption and use have identified a set of determinants related to firm characteristics that may explain why an adopting unit will adopt or reject a given innovation. Among these determinants, firm innovativeness – defined as the “capability of a firm to be open to new ideas and work on new solutions” [26] –, firm readiness – which is the level of technical and financial resources available within the organization [23, 24, 27] –, and organizational size – considered as the organizational slack resources, organizational structure and decision-making flexibility [27] – are undoubtedly the most discussed by scholars. In the specific context of SMEs, scholars found that SMEs usually have limited financial and human resources [28], limited access to IT knowledge, and therefore they will face incredible challenges when
assessing and implementing new technologies [18, 29]. However, the fact that SMEs have a less hierarchical organizational structure and a close relationship between customers and managers is considered to be conducive to greater firm innovativeness [28]; as a result, this may trigger SME willingness to explore innovations. Therefore, we hypothesize the following:

H1: Firm innovativeness will be positively related to the adoption of Twitter.
H2: Firm size will be positively related to the adoption of Twitter.

2.2 Managerial Characteristics: Importance of Age, Gender and Education

When discussing the adoption and use of IT by SMEs, the determinants related to manager characteristics seem to be those which better explain why SMEs decide to move forward with or delay an investment in any given innovation. Indeed, SME managers play a key role during the adoption process of an IT innovation, as the adoption decision of any IT is usually influenced by the SME manager [19, 30]. For example, some scholars argue that the manager’s age has a negative effect on IT adoption as well as on initiatives for organizational change. Research suggests that “older managers have been socialized into accepting prevailing organizational conditions and routines and have greater psychological commitment to them; hence, they will be less willing to commit to changing them” (p. 499) [31].

With regards to a manager’s gender, there are mixed results from prior research [31]. For example, [32], when studying the influence of CEO gender on market orientation and performance in small- and medium-sized businesses, they found that even if females and males may work within similar organizational settings at the same hierarchical level, with similar responsibilities, “it continues to be suggested that female-led and male-led businesses will tend to perform differently on a variety of measures, such as growth and profit” (p. 479). Similarly, [33] assessed gender differences on the Internet and discovered that “one-half of the ‘digital divide’ between men and women on the Internet is fundamentally gender-related” (p. 868). [34] also analysed gender differences in Internet usage and task preferences and concluded that men were more likely to use game web sites than women.

Furthermore, the level of education is commonly recognized as a key predictor of IT adoption insofar as it determines the receptivity ability to new ideas, the feeling for new innovations, the necessity to create a favourable atmosphere for its adoption and implementation (p. 500) [31], and finally the ability to develop high competency for complex information processing in relation to any implementation effort [35]. On the other hand, “younger managers usually have greater learning capabilities and more recent education, and are therefore likely to be more risk-taking and flexible.” (p. 113) [30]. In consequence, “any effort to understand the innovativeness of small businesses must look at the characteristics (e.g., age, gender, education) of these individuals” (p. 777) [28].

Therefore, we formulate the following hypothesis:

H3: Younger managers’ will be more likely to adopt Twitter.
H4: Managers’ gender (male) will be positively related to the adoption of Twitter.
H5: Managers’ education will be positively related to the adoption of Twitter.

2.3 Environmental Characteristic: Importance of Firm Geographic Location

The adoption of an innovation by a firm is also dependent on a set of environmental characteristics such as the standards and regulations, the intensity of competitive pressure within the sector, the nature of business relationship [24, 27], as well as the firm geographic location (e.g., metropolitan area vs. non-metropolitan area). For example, the recent interest in radio frequency identification adoption and use within the retail supply chain was mainly driven by mandates from key stakeholders such as Wal-Mart. Nevertheless, the embryonic literature on social media tools acknowledges the fact that their organizational adoption mainly requires voluntary participation [36]. When analysing the attitudes of firms towards innovation in peripheral economic regions, [37] found that “technological opportunities and location exert positive effects on attitudes towards innovation” (p. 1009). Finally, in the context of e-business tools adoption and use, it was found that urban clustered SMEs were more likely to use e-business tools than rural SMEs (p. 1238) [21].

Based on this discussion, we set out the following hypothesis:

H6: Firm geographic location (metropolitan) will be positively related to the adoption of Twitter.

2.4 Control Variable

The industry sector of a firm may influence its decision to adopt a given innovation. For example, previous studies concerning e-business adoption an use indicated that the engagement of SMEs in the adoption and use of e-business tools and applications was extremely variable across sectors, thus “reflecting the heterogeneity of this type of enterprise” (p. 1238) [21]. In addition, [38] explored the adoption of e-business patterns by European firms and found that the technological context was more important for the manufacturing industry than for the tourism sector, and at the same time, that the most important to “characterise e-business adoption is the industry and their specific characteristics and not the country to which the firms
belong” (p. 53). Following this discussion, we formulate the following hypothesis:

*H7: Industry sector (manufacturing) will be positively related to the adoption of Twitter.*

### 3. Methodology

To test the proposed research model, we administered an online survey to citizens in Australia, the U.S., the U.K. and India. According to [39], “survey research is probably the best method available to the social researcher who is interested in collecting original data for describing a population too large to observe directly. .. Surveys are also excellent vehicles for measuring attitudes and orientations in a large population” (p. 238).

#### 3.1 Sample

As aforementioned, participants were recruited from four countries. Table 1 indicates how many participants were obtained from each country. 453 participants completed the survey: 321 men and 132 women. The average age of the respondents was 49 years (standard deviation of approximately 12) and the response rate was 15%.

| Table 1. Number of participants per country |
|-------------------------------|--------|
| Country  | Respondents |
| Australia  | 114  |
| USA  | 117  |
| UK  | 111  |
| India  | 111  |
| Total  | 453  |

#### 3.2 Data analysis

The proposed model was tested using logistic hierarchical regression. There were seven independent variables – firm innovativeness, firm size, manager’s age, manager’s gender, manager’s education, firm geographic location and industry sector - and one dependent variable: Twitter adoption by an SME.

### 4. Results

Table 2 highlights the results of logistic hierarchical regression and Table 3 presents the correlation matrix for the variables tested. Three of the seven proposed hypotheses were supported. Firm innovativeness, firm geographic location, manager’s age all have a significant impact on SME adoption of Twitter (Table 4).

#### Table 2. Results of Logistic hierarchical regression

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Sig.</td>
<td>B</td>
</tr>
<tr>
<td>Industry sector</td>
<td>0.368</td>
<td>0.489</td>
</tr>
<tr>
<td>Firm innovativeness</td>
<td>0.477***</td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td>0.082</td>
<td></td>
</tr>
<tr>
<td>Firm geographic location</td>
<td>-0.565*</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.379</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.029**</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0.181</td>
<td></td>
</tr>
<tr>
<td>-2log likelihood</td>
<td>332.042</td>
<td>299.176</td>
</tr>
<tr>
<td>Cox &amp; Snell $R^2$</td>
<td>0%</td>
<td>8%</td>
</tr>
<tr>
<td>Nagelkerke $R^2$</td>
<td>0%</td>
<td>14%</td>
</tr>
<tr>
<td>Overall predicted percentage</td>
<td>85%</td>
<td>84.2%</td>
</tr>
<tr>
<td>Hosmer &amp; Lemeshow Test</td>
<td>0.1741</td>
<td></td>
</tr>
</tbody>
</table>

* p < 0.1; ** p < 0.05 ; *** p < 0.01 ; **** p < 0.001

#### Table 4. Results of hypothesis testing

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Firm innovativeness will be positively related to the adoption of Twitter</td>
<td>Yes</td>
</tr>
<tr>
<td>H2: Firm size will be positively related to the adoption of Twitter</td>
<td>No</td>
</tr>
<tr>
<td>H3: Younger managers will be more likely to adopt Twitter</td>
<td>Yes</td>
</tr>
<tr>
<td>H4: Managers’ gender (male) will be positively related to the adoption of Twitter</td>
<td>No</td>
</tr>
<tr>
<td>H5: Managers’ education will be positively related to the adoption of Twitter</td>
<td>No</td>
</tr>
<tr>
<td>H6: Firm geographic location (metropolitan) will be positively related to the adoption of Twitter</td>
<td>Yes</td>
</tr>
<tr>
<td>H7: Industry sector (manufacturing) will be positively related to the adoption of Twitter</td>
<td>No</td>
</tr>
</tbody>
</table>
Table 3. Correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Firm innovativeness</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Age</td>
<td>-0.249****</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Gender</td>
<td>0.117**</td>
<td>-0.034</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Education</td>
<td>0.101**</td>
<td>-0.161***</td>
<td>0.041</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Industry sector</td>
<td>-0.025</td>
<td>0.031</td>
<td>0.059</td>
<td>-0.057</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Firm size</td>
<td>0.205****</td>
<td>-0.158***</td>
<td>0.210****</td>
<td>0.109**</td>
<td>0.041</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Firm geographic location</td>
<td>0.106**</td>
<td>-0.056</td>
<td>0.091*</td>
<td>0.114**</td>
<td>0.053</td>
<td>0.060</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>8. Adoption of Twitter</td>
<td>0.200****</td>
<td>-0.170****</td>
<td>0.093**</td>
<td>0.118**</td>
<td>0.032</td>
<td>0.113**</td>
<td>-0.041</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Mean 2.937 47.990 0.709 4.436 0.060 4.161 0.488 0.141
Std. Deviation 0.997 11.931 0.455 1.296 0.237 2.625 0.500 0.349

Alpha Cronbach 0.890

* p < 0.1; ** p < 0.05; *** p < 0.01; **** p < 0.001

5. Discussion

Social networking continues to grow in popularity. Facebook has more than 800 million active users [40]. Over half of these users log onto the site every day [41]. According to Wright and Hinson [42], social networking sites are now the number one tool on the Internet. In light of the simplicity and accessibility, SMEs may benefit substantially from implementing Twitter [43]. Although reports suggest that social media tools (e.g., Twitter, Facebook) enhance SMEs, there has been little empirical research on its adoption and usage [44]. SMEs are usually characterized by limited resources; however, as aforementioned, SMEs have a flatter hierarchy than larger organizations that makes SMEs more conducive to firm innovativeness [28].

The results of this study indicate that firm innovativeness (H1), manager’s age (H3) and firm geographic location (H6) all have a significant impact on SME adoption of Twitter.

As aforementioned, the literature suggests that firm innovativeness has a significant impact on the adoption of new technologies. The results of this study indicate that hypothesis 1 is supported; firms that are open to new ideas and tools are more likely to utilize Web 2.0 technologies. Hypothesis 3 is also supported; younger managers are more likely to adopt Twitter than older managers. This finding is consistent with the literature. Younger generations are more likely to use Internet based innovations than older generations. Finally, hypothesis 6 is supported; firm geographic location has an impact on the adoption of Twitter. In particular, companies in metropolitan areas are more likely to implement this tool than companies in rural areas. Key stakeholders in urban areas typically advocate implementing technological advancements to improve efficiency and reduce costs.

Surprisingly, four hypotheses were not supported. Firm size (H2), manager’s gender (H4), manager’s education (H5), and industry sector (H7) did not have a significant impact on the adoption of Twitter. Hypothesis 2 was not supported; firm size did not influence SME adoption of
Twitter. Small and medium enterprises were equally as likely to use Twitter to conduct business. Hypothesis 4 was not supported; manager’s gender did not influence SME adoption of Twitter. Hence, male and female managers are just as likely to use Twitter. The literature on the importance of gender is mixed. Future research may want to continue to evaluate this path to corroborate these findings. Hypothesis 5 was also not supported; manager’s education did not influence the adoption of Twitter. As suggested by H2, age is a more salient demographic than education level. Finally, hypothesis 7 was not supported; industry sector did not influence SME adoption of Twitter. Twitter enables all types of organizations to reach customers, suppliers and other stakeholders independent of industry type. Hence SMEs in manufacturing, merchandising and service industries all recognize the benefits of Twitter.

5.1 Implications for Research

The growing popularity of Twitter makes adoption extremely attractive for SMEs. Firms can use social networking sites to build relationships with existing customers as well as new customers. Twitter can be used to gage customers’ perceptions of new products and promotions. In many cases, Twitter can enhance a company’s brand by giving consumers an opportunity to provide feedback and share their experiences with potential customers. A better understanding of the unique challenges of SMEs will help researchers explain and measure the relationship between Twitter and firm innovativeness. This relationship is supported by a variety of stakeholders because of the large time commitment required to track customers, competitors and business domains [44].

This study identifies salient predictors of Twitter adoption for SMEs. Although research on Twitter utilization is increasing, to-date there are few studies that focus on SME use of Twitter. This study is an initial attempt to highlight factors that significantly impact Twitter adoption among SMEs. We present a parsimonious yet explanatory model that illustrates fundamental predictors of Twitter utilization among small and medium enterprises. The model can be used to advance our understanding of Twitter adoption among SMEs. Future research should continue to explore Twitter adoption among this unique subset of firms. In particular, future studies should identify additional predictors and antecedents of Twitter adoption within SMEs.

5.2 Implications for Practice

The results indicate that there is a statistically significant relationship between a firm’s innovativeness and the adoption of Twitter. In light of this relationship, organizations should do more than just encourage social interactions among employees and business units. SMEs should foster social capital within their organizations. Stronger social connections can help enhance the flow of knowledge and ideas within the organization. For example, SMEs can leverage informal groups such as affinity networks to enhance IT selection and implementation.

Results also show that younger managers are more likely to adopt Twitter. However, a manager’s gender is not positively related to the adoption of Twitter. SMEs with younger managers will be more likely to use Twitter. Hence, SMEs should implement programs to incorporate younger individuals into the management structure. Initiatives that seek to diversify the age of managers could positively influence adoption of Twitter. Several companies provide internships and co-ops designed to prepare recent college graduates for management positions. SMEs should consider implementing similar programs.

A firm’s geographic location (metropolitan) is positively related to the adoption of Twitter. As predicted, the companies in urban areas have started to take advantage of Twitter to enhance efficiency and effectiveness. Other companies should identify and implement Twitter “best practices” based on the successful Twitter implementations of metropolitan companies. Implementing lessons learned from these firms could help other companies use Twitter effectively. SMEs can use Twitter to engage customers and promote customer co-creation. Customer co-creation will allow small firms with limited resources to tap into a larger knowledge-base. SMEs should utilize contests and promotions that inspire consumers to share experiences via product or service ratings or video clips. These promotions can be used to generate business ideas and attract new customers.

Unlike geographic location, firm size and industry sector did not have a significant impact on Twitter adoption among SMEs. Also, neither managers’ education nor gender had a significant impact on the adoption of Twitter. Future studies should explore other demographic variables that may have an impact on Twitter utilization. For instance, a manager’s involvement in Twitter networks outside of the office could be an interesting characteristic to explore. Managers who participate in Twitter outside of work could be more likely to promote the adoption of Twitter within SMEs.

5.3. Limitations and Suggestions for Future Research

There are a few limitations associated with this study. As with many survey-based projects there is the potential for self-report bias. Occasionally, participants will provide responses that they believe are desired or ideal instead of reporting their actual behavior. With regards to future
research, there are numerous possibilities. In this study we obtained analysed quantitative responses from over 450 participants. Future research could focus on acquiring qualitative data from key stakeholders. For instance, future research could target individuals in control of social media initiatives (e.g. Chief Information Officers, marketing executives). Targeting key players in SMEs via interviews would allow researchers to obtain rich and insightful results. Also, future research should empirically test the role that limited resources and a flat hierarchy have on SMEs adoption of Twitter. Finding ways to overcome the challenges associated with limited resources will help guide SMEs Twitter initiatives.

6. Conclusion

In light of the increasing diffusion of Twitter within organizations, it is imperative that we understand the benefits and challenges associated with adoption. This study is an initial attempt to understand Twitter adoption among a unique group of organizations, small and medium enterprises (SMEs). Our study offers an adoption model that can be used to explore the roles of organizational and environmental characteristics on SME adoption of Twitter. The results of a survey administered to SME managers in four countries indicate that firm innovativeness, manager’s age and firm geographic location all have a significant impact on Twitter adoption. The proposed model starts to fill a gap in the existing literature by highlighting salient predictors of Twitter by SMEs.

7. References


[19] R. Boumediene, O. Lorenzo, and P. Kawalek, "Information Systems Innovations Adoption and Diffusion Among SMEs:


