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THE BUSINESS USE OF *TWITTER* BY AUSTRALIAN LISTED COMPANIES

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ABSTRACT

This paper explores the extent and nature of the pioneering business use of the social media micro blogging tool *Twitter* by ASX (Australian Securities Exchange) listed corporations in 2013. It extends and applies a data analysis framework developed by Case and King (2011) which identified early *Twitter* adopters and their business communication practices in the US, to capture corporate disclosure and financial reporting content. The study found that 60 percent of ASX 100 companies had adopted the use of *Twitter* for a variety of business purposes. These companies were not necessarily those with the largest market capital, but rather represented industries that have a need to communicate with existing/future customers and are technology focussed, which contradicts Rogers (2003) diffusion of innovation theory to some degree. The study also identified how industry sectors differ in their business use of *Twitter*. While Consumer Discretionary companies emphasised the use of *Twitter* for customer service enquiries, companies from Industrials, Energy and Materials industries were more likely to disclose financial information. Future research can apply the extended data coding framework to larger and more diverse sample ranges across different time periods, in order to refine the thematic categories. Insight gained from this study contributes to our understanding of how *Twitter* can be used for business communication purposes, and as a strategic tool for signalling innovation to corporate investors.

JEL Classifications: O14; O33; L82; M15;
Keywords: Business Innovation, Technology Adoption, *Twitter*, Social Media, Corporate Communication, ASX Listed Firms
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INTRODUCTION

The social media platform *Twitter* has made a significant impact on the way in which global corporations communicate with online consumers since its humble inception in 2006. The recent social data sharing partnership established between leading global technology firm IBM and *Twitter*[1], reflects the enormous volume of business related information that continues to be shared on the publically accessible platform, and the formal realisation of its inherent value as an information resource for the wider business community. This success can be in part attributed to the innovative exploration of the use of *Twitter* by early adopter corporations, and the learning curve practices they pioneered for the benefit of majority and lagger adopters, as classified according to Rogers diffusion of innovation theory (Rogers 2003). In the current era of intense global business competition and need for domestic economic growth stimulation, identifying the innovative business use of new Internet technologies by leading organisations, who are better equipped to resource such innovation, has never been more crucial. Hence this paper identifies the degree to which the top 100 Australian listed corporations have adopted the use of *Twitter* as of the end of 2013, and explores the nature and extent of their early corporate communication practices. Insight gained from examining this early Australian corporate activity contributes to our understanding of how *Twitter* can be used for business communication purposes, and as a strategic tool for signalling innovation to corporate investors. It further provides an empirical framework for future *Twitter* business research, based on an earlier US research conducted by Case and King (2011).

Accordingly this paper has four objectives. First, it explores the extent to which *Twitter* has been adopted for business communication purposes in an Australian context. Secondly, it extends the data analysis framework based on the research by Case and King (2011) to categorise the different types of business communication purposes identified through the use of *Twitter*. It then applies this framework to the top 100 ASX firms who had adopted the business use of *Twitter* as of November 2013. The final objective of the paper is to identify the extent to which Australian firms have adopted the business use of *Twitter* and the nature of their innovative practices, in order to contribute theoretical insight to the diffusions of innovation theory.

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The paper consists of the following format. The next section reviews the literature pertaining to the business use of *Twitter*, and the diffusions of innovation theory. This is then followed with the methodology which first, develops a *Twitter* data analysis framework based on the word established by Case and King (2011), and then applies that framework to an Australian study. The findings are then presented and discussed in relation to the literature, and the paper concludes with the limitations and suggestions for future research.

LITERATURE REVIEW

Social media platform *Twitter* belongs to the suite of online social technologies often referred to as Social Networking Sites (SNS) by Information Systems (IS) literature, or Web 2.0 by the marketing literature. They represent the second generation in the development of Internet communication services which are characterised by their ability to facilitate the dissemination of interactive information rapidly across a broad group of user demographics (Agarwal, Mondal and Nath 2011). Agarwal, Mondal and Nath (2011, p.696) state that "Web 2.0 tools enable users to actively participate, publish and interact with others on the web quickly, easily and at little or no cost". They further explain that Web 2.0 facilitates a reciprocal two way information flow, in contrast to the one way information flow of Web 1.0 service, where users become 'prosumers' as they produce and consume information simultaneously, and thereby adapt the information they consume (Kaplan and Haenlein 2010, p.66)

Described specifically as a 'micro blogging tool', *Twitter* was originally launched in the US in March 2006 and was incorporated in April 2007 to undertake the mission to "give everyone the power to create and share ideas and information instantly, without barriers" (*Twitter* Inc 2014). One of the key features of *Twitter* is the ability to broadcast short efficient messages within a 140 character word limit referred to as 'tweets'. Tweets can be 'retweeted' and shared exponentially between linked networks of 'followers'. Registered *Twitter* users 'follow' other users and can be followed back in return, in order to send and receive, and 'retweet' tweets from others (Kwak et al. 2010). The process of 'retweeting' is considered the production of information as followers can see the 'retweeted' content from the users they are following, and then change, edit or modify the message before 'retweeting' it on to their own followers.

In 2012 only 15 percent of online adults used *Twitter* on a typical day; 45 percent of *Twitter* users were men, while 55 percent were women (Bullas 2012). Of these, 56 percent were between the ages of 30 to 64, while 40 percent were aged between 18 and 29. For those who accessed *Twitter* through mobile devices, 72 percent had some college education or were college graduates (Bullas 2012). These demographics indicated early that *Twitter* held great potential for corporate communication owing to its relatively mature and well educated user base in comparison with other social media platforms.

By the end of 2014 (2 years later) it was evident that *Twitter* had successfully captured a significant share of the global social media market, reflected in its ability to accommodate over 35 different languages, and the fact that 77% of user accounts originated from outside of the US, managed by 3,600 employees around the world (*Twitter* Inc 2014). The free to use platform hosted 284 million monthly users and 500 million 'tweets' were sent each day (*Twitter* Inc 2014). Despite the enormous success, *Twitter* had struggled financially up until the end of 2013, as it has relied on advertising revenue only to fund its business model (Shankar 2014). However, it has since boasted a $1.4 billion turnover in revenue earnings for 2014 (Bennett 2015) and formed a strategic entrepreneurial partnership with IBM, where the mass volume of *Twitter* generated data will be shared and analysed using IBM's advanced Big Blue analytics software for tailored business applications and solutions (Kanaracus 2014). The recent establishment of headquarters in Hong Kong is also seen as a positive sign, with the lure of mainland China and the Asia Pacific markets clearly in its sight (Shankar 2014).

Information is shared by users on social media for all sorts of purposes, and early academic research into its pioneering business use has been largely developed by marketing researchers, and finance researchers to a lesser degree. For example, Knights (2007) identified early that many organisations were starting to monitor and police social media content to track what was being said about their companies, realising the marketing and public relations opportunities through targeting 'bloggers'[2]. More specifically, *Twitter* was being used to obtain new product feedback, announce upcoming events, shorten the product development time, target valuable marketing resources, and to explain company results and movements in share prices (Knights 2007; Fraser 2009). Jansen et al. (2009) also found that nearly 20 percent of microblogs contained some expression of brand sentiment, where *Twitter* users shared their personal experience with products or services. Scholars have further strived to understand how marketing content shared on social media platforms affect investor purchase intentions, as well as how the demographic segmentation of social media users mediate the effectiveness of marketing content (Campbell, Ferraro and Sands 2014; Naylor, Lamberton and West 2012). For example, Naylor, Lamberton and West (2012) examined the identities of social media supporters in relation to brand evaluation and purchase intention, and discovered that the composition of existing supporters versus new supporters, as well as brand rivalry and competition affect target consumers' brand evaluation and purchase intention. From the consumer's perspective, it was found that attitudes toward social media marketing have a

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significant impact on brand engagement, purchase intention and word of mouth referral intention (Campbell, Ferraro and Sands 2014). Further research has identified that businesses use *Twitter* differently for their business to business communication compared with their business to customer communication. While the former tends to be more 'emotional', neither of these two types of communication reflect a 'hard sell' approach (Swani, Brown and Milne 2014).

There were also early signs of the power of using social media to influence stock trading and the financial market and to explain company results and movements in share prices (Fraser 2009). *Derwent Capital Market* was one of the first companies to pioneer the trading of financial markets using *Twitter* sentiment analysis[3] with their launch of hedge fund 'Derwent Absolute Return Fund'. It successfully achieved a 1.86 percent return during the first month of trade as the sentiment information provided leads on share price movement approximately three days ahead of the U.S. market (Mackintosh 2012). The power of *Twitter* sentiment to predict market trends has been supported by several other empirical studies. For example, public moods were examined using GPOMS[4] dimensions (a mood measurement tool) and it was ascertained that the mood of 'calm' correlated with the shifts in the Dow Jones Industrial Average (DJIA) values that occurred three to four days later (Bollen and Mao 2011). More specifically, identifying the degree of *Twitter* adoption by corporations, and the manner in which they have pioneered the corporate use of *Twitter*, has been restricted to the United States (U.S.) with particular lenses and relatively small sample sizes. For example, Heaps (2009) examined Fortune 500 companies in the U.S. regarding the corporate reporting use of *Twitter* with a focus on Investor Relations (IR). He found that 55 percent of companies use *Twitter* for IR, and 68 percent of this subset provided links to their earnings releases. Heaps (2009) further investigated the effect of the industry sector on the adoption of *Twitter* for IR, and found that 34 percent of the companies were Technology firms, followed by Pharmaceutical/Healthcare/Biotechnology (14%) and Services (14%). In 2011, Case and King (2011) ascertained that 54 percent of Fortune 50 companies had *Twitter* accounts, while 85 percent of them used their accounts for news distribution, followed by marketing and promotion (30%), customer service (19%), and human resources (11%). However, owing to the relatively small sample size, certain industries (including aerospace & defense, household & personal products, food product, chemicals and entertainment) were deemed non-*Twitter* users simply because they were not represented in the Fortune 50 sample. These authors highlighted the need to expand the sample size to include more companies from different industries.

It has further been ascertained that adoption behaviour of social media by business organisations begins conservatively and evolves over time, especially for business related purposes (Archambault and Grudin 2012). Archambault and Grudin (2012) conducted a four-year longitudinal study between 2008 and 2013 and found that the adoption pattern of SNS tools (including *Facebook*, *Twitter*, and *LinkedIn*) differed greatly because of the demographic factors such as gender, age and level within the organisation. Similar to the adoption of emails and instant messaging, corporate managers need to learn the value of using micro-blogging tools first by adopting their use in an informal manner, prior to their full adoption for formal business communication purposes. This staged process was also identified by Zhao and Rosson (2009), who ascertained that companies first start using social media to simply distribute corporate information as well as collect external information. Archambault and Grudin (2012) further identified that social media tools allowed corporations to share information at a lower cost and in a more efficient manner, as well as strengthen ties with consumers, and predicted an increase in their corporate use once managers recognised their inherent business value. Therefore, it appears that learning to use *Twitter* for customer service and marketing related purposes is a fairly straight forward process. However, the use of *Twitter* for disclosing financial related information involves a greater understanding of the strict rules governing the financial reporting obligations of listed companies. It is, therefore, reasonable to predict that the corporate use of *Twitter* may start with company promotion and customer service enquires, before distributing financial related information which requires an in depth corporate understanding of the legal risks associated with the release of market sensitive corporate information across *Twitter*.

These examples demonstrate that *Twitter* has successfully captured the interests of business researchers across a variety of disciplines. It has further provided important insight into the early adopter behaviour of corporations pioneering the use of *Twitter* for business communication purposes, and highlights the importance of learning how to leverage the new technology for effective business purposes over a period of time. This staged learning approach to the effective business use of social media can be correlated with the Rogers diffusion of innovation theory (Rogers 2003), where 'Innovator' and 'Early Adopter' corporations who represent the first 16 percent of *Twitter* business users, pioneer the most effective way in which to leverage the business value of the platform for the 'Majority' to then follow suit. Rogers (2003) states that innovation adoption is a multistep 'process' that involves gaining knowledge first, followed by forming an attitude, deciding to adopt or reject, then implementing and confirming a decision. This complex learning and decision making process made over time, highlights the critical role that Innovator and Early Adopter corporations play in shaping the norms and practices that eventually provide best practice examples that become institutionalised by mainstream organisations. It is important, therefore, to identify the types of organisations that are likely to be

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early innovation adopters in order to observe and learn from their pioneering efforts and ingenuity. Further, understanding the types of organisations that leverage new technologies early helps to provide insight into the characteristics of business entities that can better enable the diffusion of technological advantage. Frambach and Schillewaert (2002) provide a conceptual framework of determinants of organisational innovation adoption which includes the perceived value and benefits of the new innovation, as well as the size, structure and innovativeness of the firm. They state that larger sized organisations, those with decentralised and less formalised structures, as well as those who are more receptive to new ideas, are positively associated with innovation adoption (Frambach and Schillewaert 2002). Firms with larger number of employees, and with higher levels of employees' education, are more likely to adopt Web 2.0 technology (Frambach and Schillewaert 2002).

The above literature reflects that early adopters of *Twitter* tend to share common characteristics. To further support these findings and to contribute to the innovation adoption literature, this paper examines findings from an Australian study conducted in 2013. The study identified the characteristics of the Australian ASX Listed companies who had adopted the use of *Twitter*, and the nature and extent of their pioneering innovative business related activity. The next section explains how a data collection and analysis framework was developed based on the research conducted by Case and King (2011) and applied to the unique Australian study.

METHODOLOGY

Explorative online research was undertaken to address the following research question: 'What was the extent and nature of the business use of *Twitter* by Australian listed companies?' To assess the 'extent' aspect the research study examined which Australian listed companies had adopted *Twitter*, and what were their firm characteristics (industry sector and market capital) and *Twitter* adoption dates. This was referred to as Stage 1. This stage used general online search methods on a single day (November 30, 2013) to identify the Australian companies and associated information. To assess the 'nature' aspect the study then examined how those Australian listed companies, identified in Stage 1, were using *Twitter* for business purposes. This was referred to as Stage 2, which used content analysis and thematic template analysis to examine the content of the company tweets. This revealed the different types of business communication purposes that *Twitter* was being used for. The sample companies originally selected for the study were the top 100 (by market capital) listed Australian Stock Exchange (ASX) companies as of November 30, 2013.

Data Collection – Stage 1

The first part of Stage 1 was conducted using the ASX's website (www.asx.com.au) search tool to identify and then search the full business name (as per the ASX listing) in order to locate the companies' registered corporate homepage. Special attention was required to determine the correct homepage, as many companies had various subsidiary brands, containing the keyword of the business name. The company homepages were then searched for the *Twitter* word or symbol, to denote a link to a corporate *Twitter* account. If there was no identifiable link to a corporate *Twitter* account, then a search of the *Twitter* platform itself was conducted for the full ASX listed business name (as above) in order to establish if the company did indeed have a *Twitter* account, however, did not advertise it on the corporate homepage. This was often not a straightforward process, for example, search terms on *Twitter* often required shortened versions of company names owing to the word limitations of the *Twitter* account name rules. Sometimes a company name search retrieved multiple *Twitter* accounts. In this case the Australian account was always deemed to be the most suitable one, for example '@flightcentreAU' was chosen over '@FlightCentre_UK'.

It was ascertained that 60 of the ASX 100 companies (60 percent) had a legitimate corporate *Twitter* account. Relative to the original sample, these firms collectively represented the Innovator/Early Adopter/Early Majority categories according to Rogers (2003) Diffusion of Innovation theory. This result was similar to the findings in Case and King (2011), which showed that 54 percent of the Fortune 50 companies held a *Twitter* account in 2009. A search of their respective GICS industry sectors and market capital value was also conducted, as early adopters of new technology are said to have greater financial resources, and are more likely to be from a technology sector compared with the Late Majority and Laggard category of adopters (Rogers 2003). The official *Twitter* account name, along with the date of the first tweet (denoting adoption date) was also noted, in order to determine the *Twitter* adoption date of each individual *Twitter* account (see Table 1. FIRM CHARACTERISTICS TEMPLATE). A *Twitter* service called *Discover First Tweet*[5] was used to track the historical first tweet, if the number of tweets was greater than 3200.

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TABLE 1. FIRM CHARACTERISTICS TEMPLATE

Firm Characteristics	
Company Name	Westpac Banking Corporation
GICSIndustry Sector	Banks
Market Capital ($AUD)	101,479,336,805.76
Self-Promo *Twitter* Account (1=Yes; 0=No)	1
Twitter by Search (1=Yes; 0=No)	1
Twitter Account Name	@Westpac
First Adoption Date	20/11/2009

These 60 firms then became the final sample. All the official tweet data generated by these organisations was extracted using a third-party *Twitter* service provider called *TwimeMachine.com*[6] .Owing to the API limitation on the number of available tweets for extraction, only the most recent 3200 tweets were generated. Once extracted, all tweets were saved and converted into a Microsoft Excel file and stored in two separate locations; one copy was stored on the researchers' university network hard-drive; another backup copy was stored on a remote hard disk. As the nature of *Twitter* is an open platform, all the tweets were publicly available for extraction through the *TwimeMachine* API.

Data Analysis – Stage 2

A pilot study was then conducted using content analysis on the top ten, by current market value, of the *Twitter* posts of the 60 identified ASX listed companies. This enabled the identification of the main business purposes that *Twitter* was being used for, and hence the development of a thematic coding template for the subsequent data collection process. Content analysis is the "process of identifying, coding, and categorizing the primary patterns in the data" (Patton 1990, p. 381) and thematic template analysis involves the "careful reading and re-reading of the data" (Rice and Ezzy 1999, p. 258). Crabtree and Miller (1999) argue that using a template (or code manual) prior to undertaking thematic analysis is essential, which serves as a data management tool for identifying and organising the data themes, and supports the credibility of a study (Fereday and Muir-Cochrane 2008).

The thematic template began with five categories identified earlier by Case and King (2011) as being 'Human Resource' ('Human Resource Management' in this paper), 'Customer Service' ('Consumer Service Enquiries' in this paper), 'Marketing/Promotion' ('Corporate Promotion' in this paper), 'News Distribution', as well as 'Investor Relation' identified by Heaps (2009). However, on completion of the pilot study, the category of 'News Distribution' was further separated into 'Corporate News' and 'Market News' as firms had disclosed company specific news, as well as general market news. Other categories were also identified as being 'Corporate Social Responsibility', 'Event', 'Financial Reporting', 'Potential Financial Impact' and 'Miscellaneous'. This reiterative process resulted in the development of an extended *Twitter* analysis framework consisting of eleven business content themes which is one of the key contributions of this paper. An explanation of these themes is listed in Table 2. THEME DEFINITION AND EXPLANATION.

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TABLE 2. THEME DEFINITION AND EXPLANATION

Tweet Post Themes	Definitions	Data Analysis Code
1.Human Resource Mangement (Case & King 2011)	Changes in or new appointments of staff, Announcements related to company staff, such as the receipt of awards or details of public speeches.	HRM
2. Customer Service Enquiries (Case & King 2011)	Answering inquiries, i.e. @ another user replies.	CSE
3. Corporate Promotion (Case & King 2011)	Promotion of products and services of listed companies.	CP
4. Investor Relations (Heaps, 2009)	Corporate announcements such as the update of AGM and dividend policies (no specific financial content).	IR
5. Corporate Social Responsibility (CSR)	CSR issues such as companies donating money to charity, or becoming sponsors of Olympic or aboriginal events.	CSR
6. Market News	Announcement about markets, such as the change of central bank interest rate.	MN
7. Event Tweet	Promotion of specific company events, such as a lucky draw for customers.	ET
8. Financial Reporting	Specific Financial Reporting information, such as profit and dividend announcements.	FR
9. Potential Financial Impact	Any news that may impact share price, profit, or dividend in the future, but does not quote financial values.	PFI
10. Company News (Case & King, 2010)	Corporate announcements that cannot be categorised in the above themes.	CN
11. Miscellaneous	Anything else such as 'Merry Christmas' or 'Thank God it is Friday'.	MTR

Thematic template analysis was then systematically applied to all the extracted tweets of the 60 sample organisations, according to the eleven template themes. Many of the tweets were not mutually exclusive and could be categorised as several themes. Whenever this occurred, the tweet was broken down into its smaller subset of themes, and recorded separately. This was deemed to better reflect the multiple meanings embedded in the one message more accurately than the recording of only one overarching theme.

FINDINGS

Stage 1 – *Twitter* Adoption by Industry

There were ten industries represented in the original sample of the 100 ASX listed companies. These were, in order of number of firms (largest to smallest), Financials (27 firms), Materials (16 firms), Consumer Discretionary (14 firms), Industrials (12 firms) Consumer Staple (7 firms), Energy (7 firms), Healthcare (7 firms), Utilities (5 firms), Telecommunication Services (3 firms) and Information Technology (2 firms). See FIGURE 1. ASX 100 COMPANY DISTRIBUTION BY INDUSTRY SECTORS.

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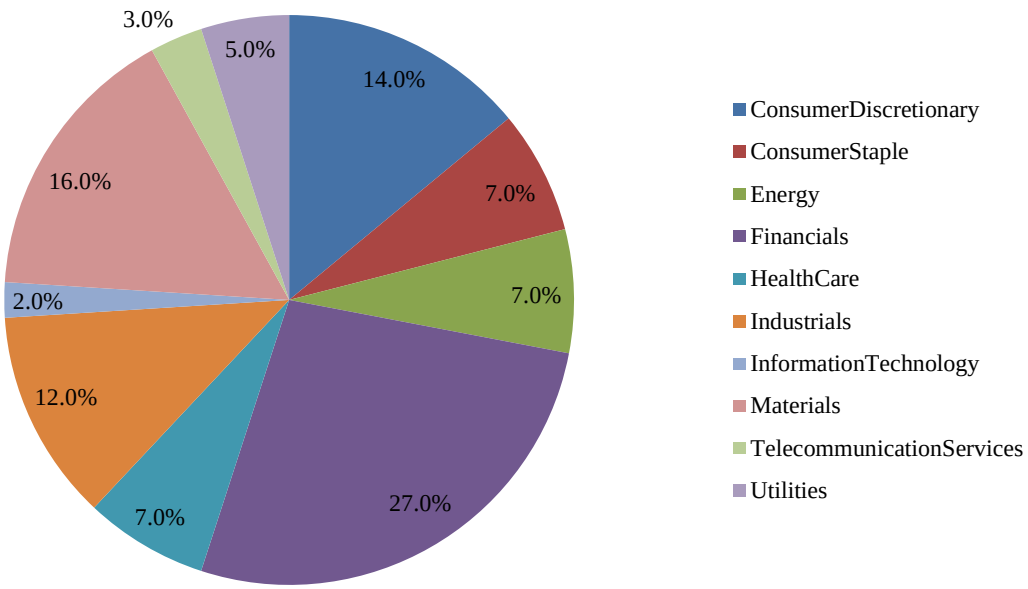
FIGURE 1. ASX 100 COMPANY DISTRIBUTION BY INDUSTRY SECTORS



The composition of the industry sectors depicted in Figure 1 differ to those of Case and King's (2011) as their sample represented Healthcare (14 percent), Petroleum Refining (12 percent), General Merchandiser/Retailer (12 percent), and Commercial Bank (12 percent). It further differed to Heaps' study (2009) which represented Technology (34 percent), Pharmaceutical/Healthcare/Biotechnology (14 percent), Services (14 percent), and Industrial Goods/Basic Materials (9 percent).

As stated earlier, 60 percent of the 100 ASX listed companies had *Twitter* accounts. Table 3. DISTRIBUTION OF *TWITTER* ACCOUNTS BY INDUSTRY SECTORS shows a breakdown of the number of firms within these industry sectors that had *Twitter* accounts. Both firms representing the Information Technology sector (100%) had *Twitter* accounts, 9 of the 12 Industrials (75%) and 10 of the 14 Consumer Discretionary firms (71%) all had *Twitter* accounts. At the lowest point of the adoption scale, only 1 of the 7 Consumer Staple firms (14%) had a *Twitter* account. Of course, while these are insightful findings, it is difficult to draw clear conclusions based on the adoption rate percentages, given the widely differing number of industry related firms represented in the sample.

TABLE 3. DISTRIBUTION OF *TWITTER* ACCOUNTS BY INDUSTRY SECTORS

Industry Sector	No. of Firms	No. of *Twitter* Account	*Twitter* Account Percent
Consumer Discretionary	14	10	71.43%
Consumer Staple	7	1	14.29%
Energy	7	4	57.14%
Financials	27	17	62.96%
HealthCare	7	4	57.14%
Industrials	12	9	75.00%
Information Technology	2	2	100.00%
Materials	16	9	56.25%
Telecommunication Services	3	2	66.67%
Utilities	5	2	40.00%
Total	100	60	60.00%

Nevertheless, the results can be compared with the findings of Case and King (2011), where the *Twitter* adoption rate by industry of their sample included Computer/IT (100%), Telecommunications (100%), General Merchandiser/Retailer (66%), and Food & Drug Store and industries (50%). Apart from the Telecommunications industry, the industry adoption rates are therefore quite similar to the US findings. It should be little surprise that both firms from the Information Technology sector (and the Computer/IT firms in

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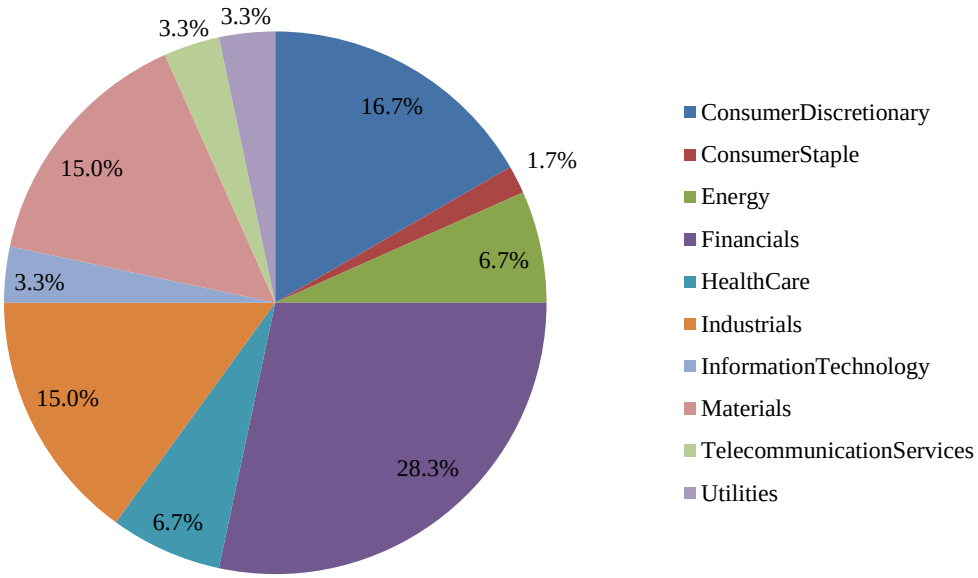
the US study) had adopted *Twitter*, as Rogers (2003) ascertains that firms that are open to, and have the need to adopt new types of technology, will be early adopters. In this case, Information Technology, Industrials, Consumer Discretionary, followed by Telecommunication Services, all reflected this 'openness' to the new technology of *Twitter*.

FIGURE 2. ASX 100 *TWITTER* ACCOUNTS DISTRIBUTION BY INDUSTRY SECTORS



In the above FIGURE 2. ASX 100 *TWITTER* ACCOUNTS DISTRIBUTION BY INDUSTRY SECTORS, the distribution by industry sector of listed companies that had *Twitter* accounts, is presented. When comparing Figure 1 with Figure 2, the ratio of each industry sector represented changed, owing to the differing *Twitter* adoption rates. For example, the ratio of Industrials companies increased from 12.0% to 15.0% and the ratio of Financials companies went up 1.3%. This is because the *Twitter* adoption rates for these two industry sectors are both greater than the average *Twitter* adoption rate in ASX 100, which is 60% (see Table 3).

Stage 1 - *Twitter* Adoption by Date

Firms belonging to the top 100 Australian ASX listed companies began adopting *Twitter* in 2008 and a spike of adoption behaviour occurred in the second quarter of 2009. From then on, most of the *Twitter* adoption activity occurred in the third and fourth quarters annually, up until the end of data collection in November 2013. This was determined by examining the dates of the first company tweets. Figure 3. DISTRIBUTION OF *TWITTER* ADOPTION RATES BY YEAR-QUARTER below illustrates these findings indicated in red, and reveals that it is possible to draw a bell shape diagram (the blue curve line) which can be roughly correlated with the adoption pattern depicted in Rogers Diffusion of Innovation Curve model (Rogers 2003) as per FIGURE 4. ROGERS DIFFUSION OF INNOVATION ADOPTION CURVE (Rogers, 2003) shown below Figure 3. Figure 4 predicts the spread of adoption rate for innovation over time. The adoption rate curve peaks in the middle when the majority of adopters have adopted a particular innovation. In this study, the blue curve line in Figure 3 shows a similar pattern, where the adoption rate peaked at the second quarter of 2009, and decreased from then onwards.

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FIGURE 3. DISTRIBUTION OF *TWITTER* ADOPTION RATES BY YEAR-QUARTER

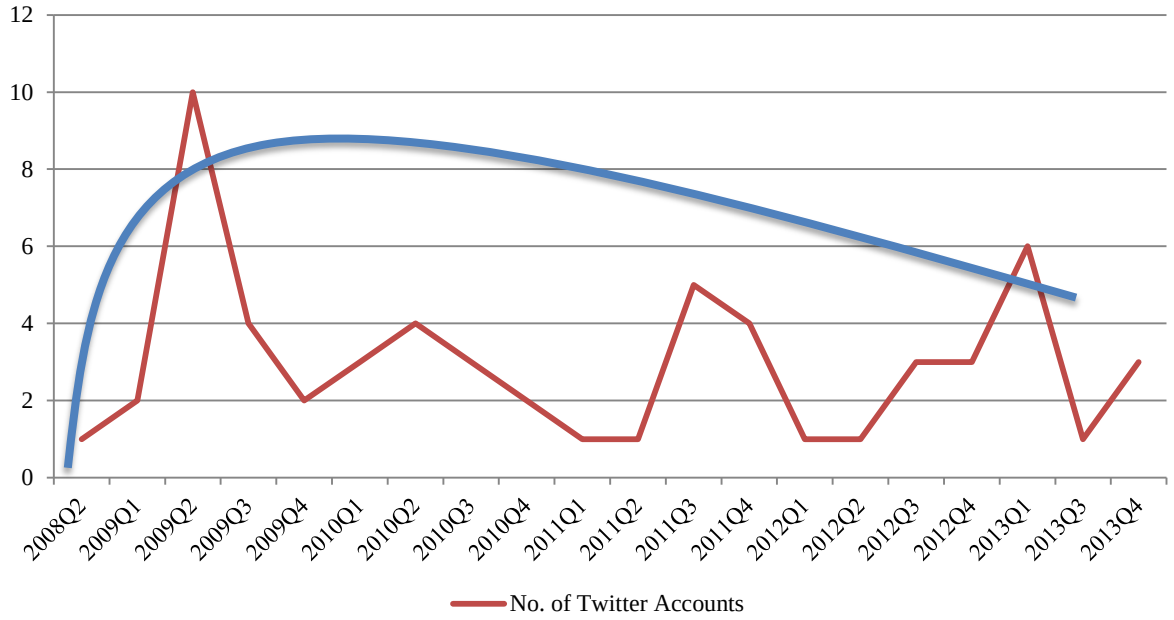
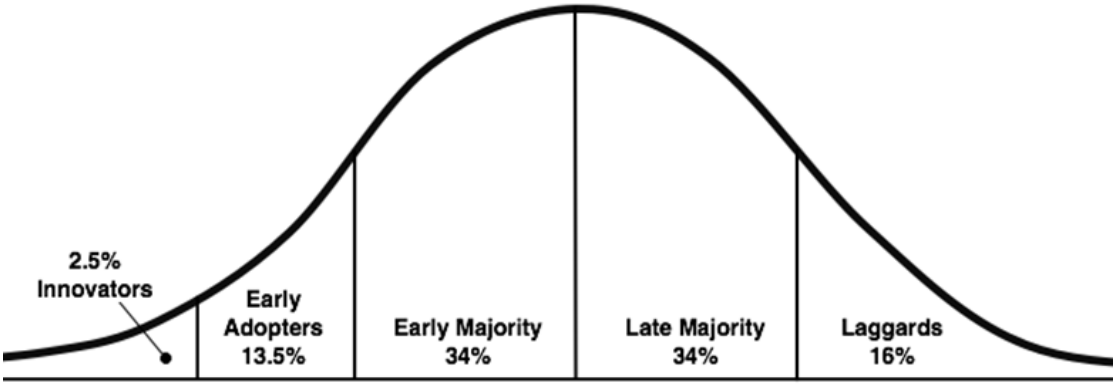


FIGURE 4. ROGERS DIFFUSION OF INNOVATION ADOPTION CURVE (Rogers, 2003)



Stage 1 - *Twitter* Adoption by Market Capital

A scatter plot diagram is useful for examining the pattern of *Twitter* adoption over time by market capital of the 60 ASX listed companies. Figure 5. DISTRIBUTION OF *TWITTER* ADOPTION DATE (YEAR-QUARTER) BY MARKET CAPITAL reflects that most of the *Twitter* adoption behaviour is concentrated on the lower levels of market capital (less than $AUD 20,000,000,000), which appear to span consistently over the five year period.

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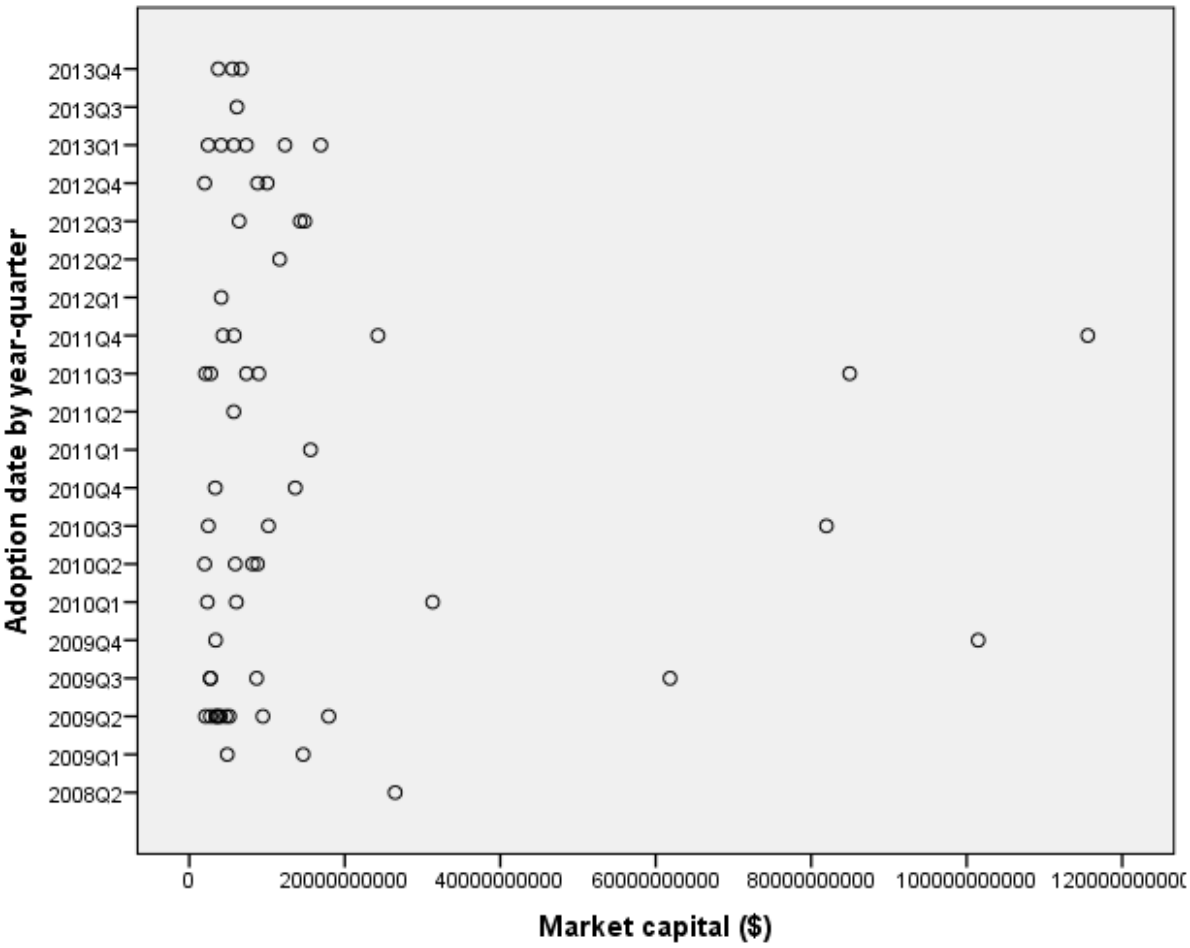
FIGURE 5. DISTRIBUTION OF *TWITTER* ADOPTION DATE (YEAR-QUARTER) BY MARKET CAPITAL



When viewing the distribution of the ASX 100 listed companies above, from the aspect of market capital, it is clear that they represent a broad range of $AUD values. These findings are further detailed in TABLE 4. DISTRIBUTION OF *TWITTER* ACCOUNTS BY MARKET CAPITAL GROUPS.

TABLE 4. DISTRIBUTION OF *TWITTER* ACCOUNTS BY MARKET CAPITAL GROUPS

Market Capital ($M)	No.	Valid	Percent
>70,000	3	2	66.67%
70,000>$>30,000	7	4	57.14%
30,000>$>20,000	2	2	100.00%
20,000>$>15,000	4	3	75.00%
15,000>$>10,000	10	8	80.00%
10,000>$>7,500	8	6	75.00%
7,500>$>5,000	16	12	75.00%
5,000>$>2,500	33	16	48.48%
2,500>$	17	7	41.18%
Total	100	60	N/A

As indicated in the above table, the range of market capital categories is not evenly represented. For example, the second category ranges from $AUD 70,000M to $AUD 30,000M, representing a difference of $AUD 40,000M. The sixth category from the top ranges from $AUD 10,000M to $AUD 7,500M, with a difference of $AUD 2,500M. Arranging the firms into these market capital categories helps to analyse their pattern of *Twitter* adoption more conveniently, as depicted in FIGURE 6. PERCENT OF *TWITTER* ADOPTION BY MARKET CAPITAL GROUPS ($M).

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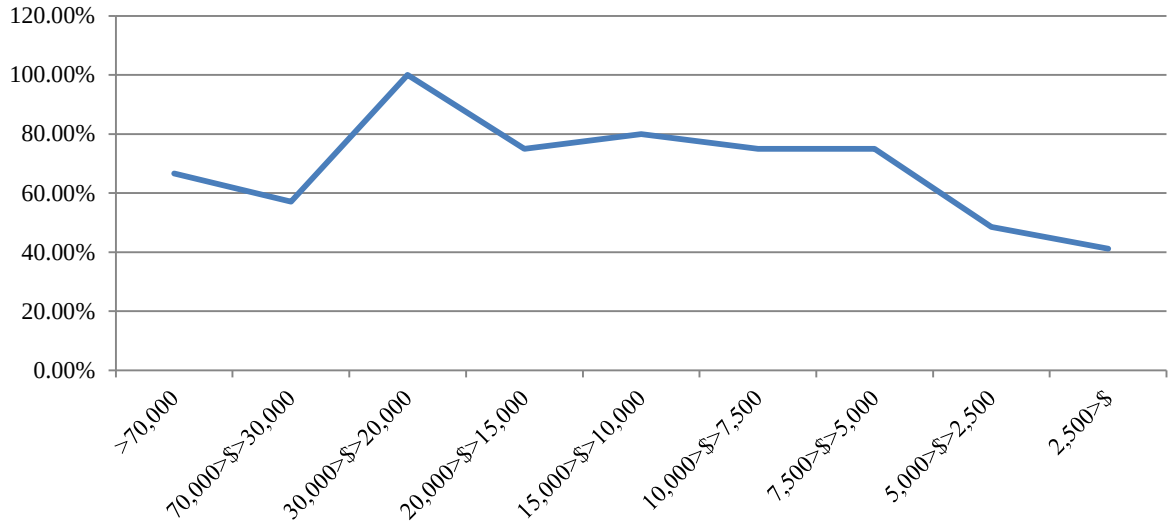
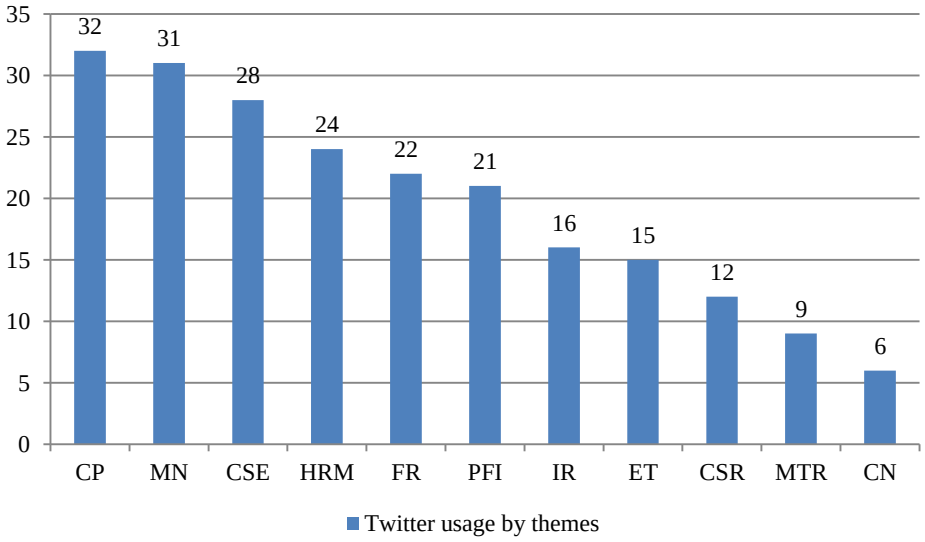
FIGURE 6. PERCENT OF *TWITTER* ADOPTION BY MARKET CAPITAL GROUPS ($M)



When viewing the *Twitter* adoption rates by firms grouped into market capital ranges, it is clear that the *Twitter* adoption rate peak then plateau slightly, and then decreases with the reduction of market capital value. To a certain degree, this is in line with Rogers (2003) diffusion of innovation theory which states that companies with larger market capital have more resources to adopt new technologies. However, the low cost and easily accessible nature of the *Twitter* platform may contribute to the broader sustained adoption line depicted across most market capital categories.

Stage 2 - Business Use of *Twitter*

FIGURE 7. *TWITTER* USAGE BY THEMES



To examine the Stage 2 findings, FIGURE 7. *TWITTER* USAGE BY THEMES shows the number of companies that had used *Twitter* for the different business purposes within their company tweets as per the data analysis framework. It revealed that the most popular business use of *Twitter* was for Corporate Promotion (32 companies, or 53% of the sample), followed by the distribution of Market News (31 companies or 52% of the sample). This was then followed by Customer Service Enquiries (28 companies; 47%), Human Resource Management (24 companies; 40%), Financial Reporting (22 companies; 37%), Event Tweets (15 companies; 25%), Corporate Social Responsibility (12 companies; 20%), Miscellaneous (9 companies; 15%) and finally Company News (6 companies; 10%).

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Stage 2 – Business Use of *Twitter* by Industry

When comparing the business use of *Twitter* across the different industry sectors, it appears that companies use *Twitter* differently according to the industry they represent. TABLE 5. BUSINESS USE OF *TWITTER* BY INDUSTRY SECTORS correlates the industry sector adoption rates of *Twitter* with the 11 different business themes. For example, the main business purpose of the company tweets by the 10 listed companies in the Consumer Discretionary sector are Corporate Promotion CP (90%), followed by Consumer Service Enquiries CSE (80%). This could be because companies in this sector must maintain frequent interaction with existing and potential new customers, as well as actively promote their product and services in highly competitive markets. In contrast, only one Consumer Discretionary company used *Twitter* to disclose Financial Reporting information FR (10%), as well as Potential Financial Impact PFI (10%), Corporate Social Responsibility CSR (10%) and Miscellaneous MTR (10%) related information.

TABLE 5. BUSINESS USE OF *TWITTER* BY INDUSTRY SECTORS (Selected)

Industry Sectors (No. of listed companies)	Corporate Disclosure Themes										
	FR	PFI	CSE	CP	HRM	CSR	MN	MTR	ET	CN	IR
Consumer Discretionary (10)	10%	10%	80%	90%	30%	10%	40%	10%	60%	20%	20%
Energy (4)	75%	75%	50%	75%	50%	25%	75%	25%	0%	0%	100%
Financials (17)	53%	65%	59%	76%	59%	41%	71%	18%	53%	12%	35%
Industrials (9)	67%	56%	67%	67%	56%	22%	44%	33%	0%	11%	33%
Materials (9)	67%	44%	22%	67%	56%	67%	56%	44%	33%	22%	56%

ASX listed firms in the financial sector emphasised the use *Twitter* for Corporate Promotion (76%) and Market News (71%), as well as Potential Financial Impact (65%). This shows that financial institutions use *Twitter* to keep customers informed with market changes such as central bank interest rates, as well as company performances.

Listed companies in the Energy, Industrial and Materials sectors, when compared with others, show more interest in using *Twitter* for Financial Reporting (75% : 67% : 67%), while all four companies in the energy sector use *Twitter* for Investor Relations (100%). This usage may reflect the market and political sensitivity of the Australian oil and mining industries and the need to keep the public informed through as many communication channels as possible in a timely manner.

CONCLUSION

The rapid development of the use of social media, especially *Twitter*, by business organisations around the world highlights the importance of understanding how it is being used for business purposes and how widespread those practices are. This paper contributes to that understanding by examining the innovative business use of *Twitter* by 60 ASX companies, considered important pioneers in this field. The objectives of the paper were to explore the nature and extent of the business use of *Twitter* by Australian listed companies, to develop an extended data collection and analysis framework based on the work of Case and King (2011), and to apply that framework to an Australian context. The paper identified who were the early adopters of *Twitter* among the ASX listed companies, as of November 2013, and the nature of their business use of the platform. This was a time when *Twitter* was a fairly new innovation for corporate communication, and yet embedded in social practice to such a degree to warrant investigation.

The paper ascertained that as of November 2013, 60 of the top ASX 100 companies representing ten different industries had adopted the use of *Twitter* for business purposes. Of these 60 firms, 27 represented the Financials sector, 16 represented the Materials sector, 14 were from the Consumer Discretionary sector, 12 from the Industrials sector, 7 from the Consumer Staples, 7 from Energy, 7 from Healthcare, 5 from Utilities, 3 from Telecommunication Services and 2 were Information Technology firms. It appears that listed companies that have a greater need to communicate with existing and future customers have experimented extensively with the use of *Twitter*. Further, technology related companies and companies with great financial resources are also tend to be early adopter of *Twitter.*

Thematic analysis of listed companies' tweets shows that companies from different industry sectors use *Twitter* for different purposes. Companies from the Consumer Discretionary and Consumer Staple industry sectors are enthusiastic about using *Twitter* to communicate with existing/potential customers and promote their

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products and services. In contrast, companies representing the Energy, Industrials and Materials industries show greater interest in using *Twitter* for financial reporting and investor relation corporate disclosure.

These findings must be considered in relation to the limitations of the study. First, and is highlighted earlier, the representation of industries and capital value of the 100 ASX listed firms were not evenly distributed, which skewed the descriptive statistics accordingly. However, the results do provide important explorative insight warranting further statistical research. Secondly, the coding process was undertaken manually by a sole researcher, which involved a high degree of subjectivity when relating the tweets to the different business purpose categories. Nevertheless, the detailed coding framework developed in the pilot study provided a clear and logical data analysis roadmap which minimised inconsistency. Thirdly, as the business use of *Twitter* has progressed significantly since November 2013, the findings established in this paper are likely to differ to current Australian business activity taking place on *Twitter*. However, as the purpose of the paper was to examine the activity of early adopter firms, the historical lens has been extremely useful and provides an important foundation for comparing future research of a similar nature. Finally, the different categories of business usage of *Twitter* were limited to eleven themed purposes, which were examined in relation to only two characteristics, being market capital and industry sector. Future research can extend the thematic template to include more business related categories, as well as examine additional company characteristics. Such extended frameworks can then be retrospectively applied to a variety of different adoption timeframes and more detailed sample organisations, to compare and contrast Australian *Twitter* business adoption behaviour with global trends, over the long term. Finally, other longitudinal studies can examine how the different business uses of *Twitter* progress over time, such as companies from the Consumer Discretionary industry having a later adoption date for Financial Reporting, compared with those from the Materials industry, despite the former having adopted *Twitter* far earlier.

Theoretical Contribution

Previous literature has examined the use of *Twitter* through a number of academic lenses, especially in the fields of marketing and finance, with a particular emphasis on the adoption of *Twitter* in a United States context. However, there is a dearth of literature applied to the Australian context, especially in the business use of *Twitter* and the corporate disclosure area. Accordingly, this study is the first to apply an extensive thematic analysis framework to the business use of *Twitter*, in order to understand the degree to which Australian listed corporations have adopted the use of *Twitter* for business purposes, and helps to identify a pathway for future research.

The study further contributes to the Rogers (2003) Diffusion of Innovation theory by showing that not only firms with large amounts of resources had adopted the use of *Twitter* (which has been a key determinant of technology adoption in the past) but the low cost and accessibility of the *Twitter* technology platform saw listed companies with low market capital also adopt the technology.

Practical Contribution

This study provides important insight into how *Twitter* has been adopted for business communication purposes by Australian companies as of the end of November 2013. The early innovation practices established by these early adopters firms provide excellent role models for firms yet to adopt the use of *Twitter* for a variety of business purposes. The study further reveals the degree of innovation occurring with the latest low cost and accessible social media technologies in an Australian context, and further provides an important introductory roadmap for future research. The study has found that market capital is not a deterrent to the adoption process, a fact which should be embraced by Small and Medium Enterprises with limited resources.

Further, the different business usage of the platform across the various industry sectors reflects the wide variety of effective purposes that the *Twitter* platform can be used for. This study highlights how certain industries emphasise the different business use of *Twitter*, which provides important strategic guidance for companies in those industries considering adopting the use of *Twitter*. The firms in the study have obviously navigated the trials and tribulations of the early adoption process and have come to understand the needs of their followers and relevance of the *Twitter* platform for their business communication objectives. For example, the study highlighted that consumer related companies have adopted *Twitter* to build their customer relationships and establish a promotional channel. In contrast, companies belong to the Energy, Industrials and Materials industry sectors have found it more effective to use *Twitter* to disclose financial related information, to support their disclosure communication obligations. This reinforces the importance of identifying the rationale for adopting the use of *Twitter* and designing tailored content accordingly to ensure the effectiveness of Web 2.0 technology adoption, by learning from those organisations who have already traversed the pioneering process.

Web 2.0 technologies such as *Twitter* have rapidly changed the way companies can communicate with stakeholders, and herald enormous communication opportunities for the future. At the moment they can be

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adopted and accessed for free and used to communicate with, and serve the needs of, customers quickly and efficiently at the global level. As companies learn the most effective way to best leverage *Twitter* to serve their respective industry communication needs, early adopters provide rich and valuable examples for others to follow, as anyone can follow the public tweets of any organisation. Therefore this research provides an important first step for the close examination of the Australian business use of *Twitter*, and highlights the significant innovation opportunities that online social technologies present for enhanced business communication practices.

ENDNOTE

[1] Brief explanation plus need the best source here maybe direct from IBM?
http://www.pcworld.idg.com.au/article/558492/*Twitter*-ibm-form-partnership-around-analytic-apps/
[2] A 'blogger' is someone that writes their own 'blog' online intended for a public audience.
[3] A tool to mine the emotional sentiment (positive versus negative for example) of Tweet content.
[4] GPOMS, Google-Profile of Mood States, is an algorithm that measures mood that was created by developers at Google. The algorithm measures six different mood levels – happiness, kindness, alertness, sureness, vitality and calmness – through people's text on the internet (Heather Struck, 2010).
[5] Discover First Tweet (https://discover.*Twitter*.com/first-tweet) is a service that allows users to find the historical first tweet of any known *Twitter* account.
[6] TwimeMachine.com is a third-party service provider, which allows users to track back up to the most recent 3200 tweets of any known *Twitter* accounts. This service is based on *Twitter* API technology and is free of charge.

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