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NEW MEDIA AND ACCOUNTING INFORMATION: A CRITICAL REVIEW

The proliferation of new media has initiated substantial changes in both the production and consumption of accounting information. The implications for accounting research and practice are thus considerable. Consequently, this paper represents a critical review of the relevant literature on new media and accounting information.

1.0 Introduction

The opening of the World Wide Web in 1995 unleashed a series of changes in the way accounting information is prepared, used, disseminated, and analyzed. On the one hand, as Web technologies have evolved from websites, bulletin boards and email to more sophisticated wikis, blogs, and social networking sites, *new media*[1] have progressively changed the quality and scale of the information that is produced. On the other hand, as more and more market-related activities and transactions exist or are conducted via electronic means (e.g., Choi, 2002; Houston & Taylor, 1999; Rappa, 2003), the actors involved in the production and use of this information have themselves been subject to continual evolutionary pressures. New media has thus become a key informational channel, with firm-relevant information diffusing rapidly through the burgeoning online networks of investors, donors, academics, analysts, journalists, information intermediaries, and other interested parties (e.g., Blankespoor, Miller, & White, 2010; Rubin & Rubin, 2010). Like financial analysts and news media (Frankel & Li, 2004), the Web now represents a key component of firms' information environment.

In short, the diffusion of new media has expanded organizational transparency, generated new types of market actors and organizational forms, changed the way investors gather information and trade, and opened new avenues of firm–market communications. There would thus appear to be ample incentive for understanding the search for, production, and spread of accounting information in this new environment. Nevertheless, accounting research has been relatively limited both in the quantity and scope of its examination of these issues. Research on new media and accounting has essentially focused on just three broad questions: the determinants and/or outcomes of voluntary Web disclosure (e.g., Debreceny & Gray, 1999), the market effects of online investor discussion (e.g., Wysocki, 1998), and the manipulation of investors in online message boards (e.g., Delort, Arunasalam, Milosavljevic, & Leung, forthcoming). Most of this research, moreover, has assumed an "information" perspective (Ball & Brown, 1968). There has been little examination of other relevant actors, issues, and approaches, such as institutional perspectives on the ongoing changes sparked by increasing new media utilization. Nor has there been much research on the micro-processes of information disclosure and use.

To help further accounting scholars' efforts at more informative analyses of both the most important changes and areas of ongoing impact, I present a critical review of the roughly 150-200 journal articles and unpublished working papers that have been written in the area of new media and accounting information. This paper reviews the literature, attempts to provide a structure to it, summarizes and weighs in on ongoing debates, and suggests limitations and opportunities for future research.

[1] The term "new media" refers to all forms of digital information and communication technologies, covering websites, text messages, email, teleconferencing software, wikis, blogs, and social networking platforms, among others. The term "social media" refers to that subset of new media that involves a heavy social, interactive component, such as the social networking sites Facebook and LinkedIn and the micro-blogging site Twitter.

This paper is organized as follows. The next section summarizes and analyzes the existing research. The third section discusses both the limitations of this research and future opportunities, including the most promising theoretical directions. The final section summarizes the discussion.

2.0 Review of Current Research

I organize my review around the actors using the technology, rather than by, for instance, accounting sub-field or media type. Figure 1 summarizes the existing literature in three ways: first, by showing the array of different producers and users that have been the focus of new media-based accounting studies; second, by differentiating users with circles of different size based on the number of studies published; and third, by position, where the space between users reflects how close, conceptually, users are to each other in the literature in terms of motivation, use, and/or market role. For example, the largest number of studies are on firms, as indicated by the size of the circle, and its location next to "Government and Nonprofit Organizations" is a reflection of how both are related conceptually in terms of the way new media are employed in the literature—as a disclosure channel.[2]

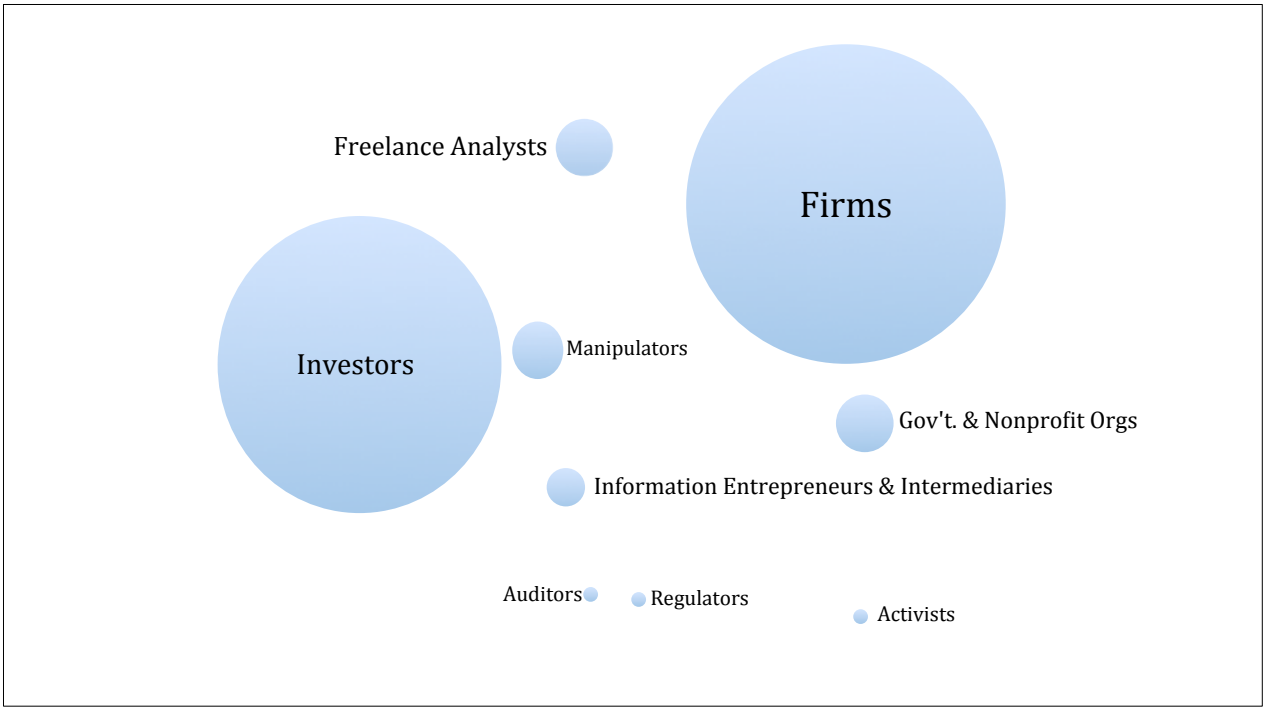

Figure 1. Users of New Media-Based Accounting Information, by Frequency in Published Research
Note: Size of circle is relative to the number of articles published. The distance between users denotes conceptual similarity in terms of use of new media (e.g., IFR, manipulation, analysis).

2.1 Firms' Use of New Media

The first significant body of research in new media and accounting concentrates on firms' use of new media as a disclosure channel, as an investor relations vehicle, and as a tool for demonstrating social responsibility and fostering accountability. I review each of these areas in turn.

[2] See the Appendix for a more formal, yet complementary *correspondence analysis* based on the reviewed literature.

2.11 ***Corporate use of new media as a disclosure channel: Internet financial reporting.*** The largest body of work has been conducted in the area of Internet Financial Reporting (IFR), starting with Debreceny and Gray (1999) and now covering roughly 50 studies in all (Debreceny, Gray, & Rahman, 2002; Kelton & Yang, 2008; Trabelsi, Labelle, & Dumontier, 2008). Thus a full quarter to third of all new media and accounting studies have been in the IFR area.

This stream of research has focused on three sets of questions related to corporate use of the website as a disclosure channel. First, there are studies that explore the practical and philosophical issues raised by the increasing use of corporate websites for financial reporting (Baker & Richard, 2006; Beattie & Pratt, 2003). Second, there are studies that explore the determinants of Internet financial reporting (Debreceny et al., 2002; Kelton & Yang, 2008; Laswad, Fisher, & Oyelere, 2005; Oyelere, Laswad, & Fisher, 2003). And third, there are studies that explore IFR outcomes, such as decreased information asymmetry and increased demands for information and standardization (Trabelsi et al., 2008; Wagenhofer, 2003). Interestingly, this is also the only area within the accounting domain that has shown much interest in the determinants of new media utilization, with the exception a paper by Wysocki (1998) that examined both the determinants and market outcomes of the volume of messages on stock boards. This focus is in line with the predominance of capital markets research in financial accounting.

A large proportion of IFR research has, collectively, been unimaginative. Many studies have relied on a simple application of the same research question simply applied to a new geographic setting, such that we now have studies close to 20 studies on the theme of "How is IFR used in *Country X*?", including studies on Australia (Almilia & Budisusetyo, 2008; Lodhia, Allam, & Lymer, 2004), New Zealand (Oyelere et al., 2003), Germany (Marston & Polei, 2004), China (Xiao, 2004), the UK (Abdelsalam & Street, 2007; Craven & Marston, 1999), United Arab Emirates (Oyelere, 2010), Spain (Gowthorpe & Amat, 1999), Japan (Marston, 2003), Austria (Pirchegger & Wagenhofer, 1999), and more than a dozen others.

More generally, work needs to be done to improve the quality of IFR research. As it exists, it has yet to evolve into a "top-tier" stream of research, at least as indicated by the quality of the publication outlets. In contrast to the success found by a handful of authors working in other areas of new media and accounting research (to be discussed later), there have been no articles specifically on firms' Internet financial reporting published in the top-tier mainstream journals, *The Accounting Review, Journal of Accounting & Economics, Journal of Accounting Research, Contemporary Accounting Research*, and *Accounting, Organizations, & Society.* There have, however, been a number of IFR articles in *Journal of Accounting & Public Policy,* a well regarded specialty journal.

One promising direction for this research would be to shift the focus from the quantity of information disclosed to the quality of information. The existing literature has concentrated almost exclusively on quantity measures, though there have been some initial efforts at measuring quality as well (Almilia & Budisusetyo, 2008). Future research should continue to develop insights along these lines.

The IFR literature has generally devoted attention to conventional motivations (e.g., to decrease information asymmetry, send signals to the market, etc.) and constraints (litigation risk, proprietary costs, political costs, agency costs) influencing voluntary disclosure, borrowing theoretical insights directly from the "offline" disclosure and positive accounting literatures (Healy & Palepu, 2001; Zimmerman & Watts, 1978). It would be fruitful to see attempts to broaden the scope of motivating factors, to extend the theoretical domain beyond economics by examining such psychological and public relations motivations as impression management (Schlenker, 1980). Literature in other fields has shown that firms have different motivations than individuals for utilizing new media, not only websites (Park & Reber, 2008) but also Twitter and other forms of social media (Park & Reber, 2008; Rybalko & Seltzer, 2010). For instance, many firms (Jansen, Zhang, Sobel, & Chowdury, 2009) use Twitter for marketing and customer-

relations purposes. Other firms use it primarily as an investor-relations tool. Instead of employing Twitter as a disclosure or information dissemination tool, we might expect such firms to be interested in not only spreading valuable information, but in managing impressions and expectations.

Also noteworthy is that the existing IFR literature has concentrated almost exclusively on annual and quarterly financial and performance disclosures. The literature would benefit from viewing disclosure as analogous to an "event," or as a form of communication that is delivered in discrete messages. This would open up different avenues of exploration. For instance, in the accounting field it would useful to explore firms' use of digital communication technologies as a form of "damage control" or "crisis communication" (Benoit, 1997) surrounding firm-specific accounting events, such as restatements or earnings warnings, or to counter takeover rumors or other externally generated information that might negatively affect a firm's stock price. What is important to note is that such firm communication might not only be in the form of additional disclosure of financial information but also in other types of discrete messages sent by the firm to key stakeholders.

2.12 ***Emerging corporate uses of new media: XBRL and Twitter.*** The above IFR Research has almost wholly concentrated on the organizational website as the disclosure channel. Two emerging technologies, XBRL and Twitter, highlight the above point regarding the continual, "discrete" nature of accounting communication in certain domains.

First, XBRL (eXtensible Business Reporting Language) is a standardized, XML-based language for the electronic communication of financial reporting data. XBRL International, an international non-profit consortium of over 600 companies and agencies, is developing it using an open standard with no license fees (XBRL International, 2011). With financial information prepared using XBRL, each piece of business data includes a specific "tag." These tags allow, among other things, the users of the financial information to quickly and automatically find specific bits of information. In effect, XBRL breaks traditional financial statements down into discrete pieces of machine-readable information. It brings the analogy of the discrete "message" to the financial reporting arena.

In terms of published research on XRBL, Debreceny (2001) had an early study on XBRL as an alternative or addition to website disclosure. In his study, Debreceny examines the potential benefits of XBRL for financial reporting, especially in terms of preparation, standardization, and search-facilitation. Boritz and No (2005), meanwhile, raise the issue of security problems in XBRL and its extension XARL (eXtensible Assurance Reporting Language), which will have to be addressed before such services can reach their full potential. Lastly, Hodge, Kennedy, and Maines (2004) used an experimental design to examine whether XBRL services could improve financial reporting transparency. They find such search-facilitating technologies are beneficial for both the financial statement user, in terms of facilitating the search for relevant information, and the preparer, in terms of how, for instance, it potentially simplifies reporting choices via standardized taxonomies.

Second, there is Twitter. Twitter is the world's premier *message network.* Communication occurs in the form of brief, discrete messages; this is different from the traditional corporate website, which is more akin to a static "brochure" than a vehicle for the provision of messages. Twitter is proving to be a powerful, networked, real-time information aggregation and dissemination platform; it has been found to have a robust effect in disseminating information in such contexts as disaster response efforts (Hughes & Palen, 2009), protest movements (Gaffney, 2010), and marketing campaigns (Jansen et al., 2009).

A recent accounting study by Blankespoor, Miller, and White (2010) explores firms' use of Twitter. Their focus is not on "disclosure," by which they mean the release of new information, but rather on "dissemination," which they take to mean the diffusion of information that has already been publicly

released. They find evidence that firm dissemination of press releases on Twitter is associated with decreased information asymmetry.

2.13 ***New media as an investor relations, social responsibility, accountability, and relationship-building vehicle.*** Some scholars have taken a broader perspective and explored disclosure and related Website-based activities under the framework of "investor relations" (Bollen, Hassink, & Bozic, 2006; Chang, D'Anna, Watson, & Wee, 2008; Deller, Stubenrath, & Weber, 1999; Ettredge, Richardson, & Scholz, 2002). These studies represent a useful addition to the IFR literatures in expanding the conceptualization of disclosure beyond mandated financial reports and by more appropriately "translating" investor- and disclosure-related activities to the context of the corporate website.

Related to this literature are a number of studies that have examined corporate social responsibility (CSR) in the online environment. An early study (Williams & Ho Wern Pei, 1999), for instance, compared CSR disclosures in annual reports to those made on the corporate website. However, scant follow-up research has been conducted in the accounting literature on virtual CSR efforts. Similar gaps in attention can be found in the broader areas of corporate accountability. The communication and public relations literatures have focused a considerable amount of attention on organizational use of new media to foster accountability and build relationships key external stakeholders (Park & Reber, 2008; Rybalko & Seltzer, 2010; Waters, 2008). To a lesser extent so have the general management and business ethics literatures (Jones, Alabaster, & Hetherington, 1999). In contrast, accounting scholars have paid almost no attention to the role of new media in these areas. A single study (Unerman & Bennett, 2004) explores firm–stakeholder communication and corporate accountability. Using the framework of Habermasian discourse ethics and data from Shell web forum postings, Unerman and Bennett find the level of discourse has not lived up to expectations of a democratic search for mutual understanding. That said, a more recent study (Fieseler, Fleck, & Meckel, 2010) has explored the impact of corporate blogs devoted to sustainability. The authors conclude that the use of blogs in the CSR domain represents a new and valuable form of engaging and communicating with a savvy and socially aware set of stakeholders.

Overall, these studies hint at how the landscape of investor relations is being changed by the diffusion of new media. In line with the Blankespoor et al. (2010) Twitter study discussed earlier, these studies highlight how firm–market communication goes beyond the relatively simple, binary notion of disclosure/no disclosure or, more broadly, the magnitude of disclosure, that is found in the IFR research. With blogs, Facebook, and Twitter, among other platforms, firms can take a more active role—engaging in dialogue, disseminating relevant information, or responding actively to stakeholder concerns. With the rise of *social* networking platforms, such dialogic and relationship-building strategies are becoming more important. For instance, in contrast to the underutilized Web discussion platforms studied by Unerman and Bennett (2004) in the early twenty-first century, in 2011 Twitter can boast both firms and investors as active users of the technology (Blankespoor et al., 2010). The use of Twitter thus uniquely allows for the analysis of firm–investor interactions and communications as well as the effects of these interactions on the capital markets. Future research should continue to explore the new forms of firm-market communication that are increasingly prevalent on these social media platforms.

2.2 Government and Nonprofit Reporting

Though the majority of the firm-centric literature has focused on capital-markets topics, there has been some interesting research in other areas. There have been two studies in the accounting field on IFR by government agencies (Laswad et al., 2005; Mussari & Steccolini, 2006), and there is a growing number of studies on nonprofit organizations (Gandía, 2011; Saxton & Guo, 2011; Saxton, Neely, & Guo, 2009). Gandía (2011) approached Internet disclosure as an accountability and transparency issue, and found that the amount of disclosure on Spanish NGO websites was related to future donations. Gandía's measures of Internet disclosure incorporated information on not only governance and financial

information, but also on the navigational characteristics of the site, on the basic organizational information provided, and on whether the site incorporated any "relational" content that might facilitate stakeholder collaboration and relationship-building. Saxton, Guo, and Neely (2009) similarly examine the relationship between financial and performance-related disclosures and subsequent net levels of charitable contributions. Thus far, these nonprofit studies have taken primarily economics-based approaches to understanding disclosure motivations and an "information" perspective regarding the effects of disclosure on the charitable contributions market.

2.3 Investor Use of New Media

As shown in Figure 1, a third key producer and user of new media-based information is the investor. Investors are using new media as an important research, discussion, and information dissemination tool. In fact, besides IFR research, the second largest body of research has been on investor discussion in stock market and investing message boards (Antweiler & Frank, 2004; Bettman, Hallett, & Sault, 2010; Clarkson, Joyce, & Tutticci, 2006; Das & Chen, 2007; Das & Sisk, 2005; Delort et al., forthcoming; Dewally, 2003; Felton & Kim, 2002; A. L. Jones, 2006; Lerman, 2010; Tumarkin, 2002; Tumarkin & Whitelaw, 2001; Wysocki, 1998).

As with IFR research, investor-focused research has chiefly taken an "information" perspective and examined the relationship between message board postings and stock price and volume. The studies generally find significant market reactions to message board postings, often with price reversion subsequent to the initial reaction. Save for a working paper by Lerman (2010), however, these studies have not explicitly looked at the relationship between investor discussion on message boards and information asymmetries, as, for example, Frankel and Li (2004) did with traditional forms of media. Additional scholarly attention here might prove useful. The notion of "investor attention" would also be helpful in pushing the literature in new directions. In the extant literature we can only indirectly see what captures investor attention. We should now begin to study specifically what types of new media-based information investors are paying attention to. Such studies would facilitate the incorporation of broader theoretical perspectives, especially those that tap psychological and sociological influences on behavior.

2.4 Malicious Use of New Media to Influence Markets: Stock Spam & Message Board Manipulation

A fourth group of actors studied in the accounting literature are those that deliberately attempt to manipulate investors. To start, two studies have simultaneously tackled the issue of stock "spam" (Böhme & Holz, 2006; Frieder & Zittrain, 2006). Both found that email spam can be effective in altering stock prices, at least for thinly traded securities. These studies point to a broader concern with the ability of digital communication technologies to manipulate market participants through "pump and dump" schemes, where spam touts the benefits of penny stocks or, conversely, the "poop and scoop," where the spam points out negative aspects of a security. The growth in the diversity of digital communication channels has led to a further propagation of the types of spam. For instance, the development of blogs has led to investment-related spam blogs, known as "splogs." Even more recently, many of those who give advice on the micro-blogging site Twitter appear more interested in marketing their own services or pushing certain penny stocks than on imparting genuinely useful advice. These newer developments would benefit from further study, if only to see whether they are more or less effective in their ability to manipulate the market. As of now, we cannot be sure one way or the other.

Continuing the theme of manipulation is a forthcoming study on Internet stock message boards (Delort et al., forthcoming). The authors study manipulation from a different angle, looking not at the effects of manipulative messages but instead at which types of firms are targeted. They find the most frequent targets of manipulation in Internet message boards are those with "…higher turnover, lower price level, lower market capitalization and higher volatility," and that such manipulation "…is positively

related to market returns, volatility and volume" (p. 1). Collectively, the above set of studies suggest that, at least for thinly traded stocks, manipulators' efforts at influencing investor behavior are, on average, effective.

2.5 "Amateur" and "Freelance" Analysts: The Democratization of Financial Analysis

One of the key features of wikis, blogs, social networking sites, and other advanced forms of new media is how they facilitate intense collaboration, dialogue, information exchange, and customizability—they are intensely interactive and participatory forms of media that rely heavily on user-generated content and bottom-up knowledge generation (e.g., O'Reilly, 2007). Within this context, it has become relatively costless for any interested investor to become an unpaid (and often unsolicited) "analyst."

It is unlikely, though this has not been examined empirically, that investors paid much attention to these analysts in the early days of the twenty-first century, when blogs were new and maintained by a single individual or a small group of people. However, in 2011 top investment blogs have dozens or even hundreds of paid and/or volunteer "contributors," in addition to a pre-assembled core team of authors and editors. The top investment blog aggregator, *Seeking Alpha,* has more than 4,000 contributors, over 400 of whom are considered "regular" contributors. *Seeking Alpha* has thus become a venue for both professional and non-professional analysts alike. Fotak (2008) studied the effects of *Seeking Alpha* "long" and "short" stock recommendations on subsequent price and volume reactions. He found a general price and volume effect, which was more substantial when the recommendation was given by analysts with more professional credentials, such as a graduate degree in finance or economics, but did not find a wholesale rejection of investment advice given by "non-professionals." A recent working paper similarly found that content posted on *Seeking Alpha* is value-relevant (Chen, De, Hu, & Hwang, 2011).

In a study of blog posts discussing S&P500 firms found on 150 top financial blogs, Saxton (2009) found that, the more information in the blogosphere targeting a particular firm, the lower the level of information asymmetry between firm insiders and the general S&P500 market. As in Frankel and Li (2004), Saxton proxied for information asymmetry by measuring the profitability and intensity of insider trades; the hypothesis, partially supported by preliminary evidence, is that the information provided on the top 150 financial blogs can limit insiders' capacity to trade on private information.

Collectively, these studies indicate that financial blogs have a large and dedicated audience, and note that blog reports are often picked up by the mainstream media (Fotak, 2008; Saxton, 2009). In the blogosphere there is a more level playing field between investor and analyst, as well as between professional and non-professional analysts. As a result, these blogs have become marketing tools for analysts, consultants, and authors to boost their prestige, build their "brand," and acquire customers. High-quality bloggers can earn a living indirectly tied to the frequency and quality of their unpaid financial analyses and stock recommendations. I refer to these analysts as "freelance" analysts. Similarly, I refer to those who publish analyses on financial blogs and other forms of new media without a profit motive as "amateur" analysts. These "amateur" and "freelance" analysts provide recommendations, make forecasts, etc., just as regular, full-time analysts employed at financial institutions. Though the quality of their analysis runs the gamut, this phenomenon highlights the significant "democratization of analysis" that has occurred with the diffusion of sophisticated forms of new media, first with blogs and investment forums and now with social networking sites such as Twitter and StockTwits. Future research should continue to examine these new types of analysts, building on frameworks and tools developed in existing capital markets studies of traditional sell-side financial analysts. It would also be useful to have analyses that attempt to see whether and how the "Briloff Effect" (Desai & Jain, 2004; Foster, 1979) translates to the new media context.

2.51 ***Whisper forecasts.*** The terms "whisper forecasts" and "whisper numbers" predate new media, and refer to the unofficial earnings per share (EPS) forecasts that made their way around the water cooler or the trading floor on Wall Street. With the advent of new media, specific platforms have been developed to tap in the "wisdom of crowds" (Surowiecki, 2004) by aggregating the EPS forecasts of a wide range of anonymous professional and amateur analysts. A healthy stream of research has been conducted using data from these whisper forecasts websites, likely sparked by the early success of Bagnoli, Beneish, and Watts (1999) in publishing in the *Journal of Accounting & Economics*. Follow-up studies have dug deeper into the types of whisper forecasts that are more influential (Brown & Fernando, 2011; Dewally, 2008; Harjoto & Zaima, 2006; Harjoto, Zaima, & Zhang, 2009; Machuga, Teitel, & Pfeiffer, 2008; Zaima & Harjoto, 2007). Interestingly, the initial excitement over the potential arbitrage opportunities found in online whisper numbers has subsided (Brown & Fernando, 2011). One possible reason is that the managerial control systems found on whisper number sites is not conducive to tapping the wisdom of crowds, insofar as they violate some of the conditions (especially the independence of decision-making) that are necessary to tap into any underlying "wisdom" that might be found in an anonymous and heterogeneous virtual crowd of amateur analysts. Preliminary evidence by Depken and Zhang (2008) supports such conjecture: they found that the incorporation of "reputation systems" in online message boards makes investment posts more informative than the "cheap talk" that prevails on anonymous message boards.

2.6 Other Actors' Use of New Media: Auditors, Regulators, Activists, & Intermediaries

As seen in the above review, the existing literature has been dominated by analyses of a few key actors in the capital markets, especially firms and investors, along with those who would attempt to influence investor behavior, namely spammers and amateur and freelance analysts. However, the literature has not expended much effort at all on other users, preparers, or disseminators of accounting information. For instance, only one study (Lymer & Debreceny, 2003) was found that included an explicit focus on regulators' use of new media. Similarly, the online news media has received no attention from accounting scholars, despite the ostensibly growing role of online news in informing day traders and other investors. There are, however, budding streams of research focusing on several other actors.

2.61 ***Auditing research.*** A few studies have examined the roles and interests of auditors in Web-based financial reporting. Beattie and Pratt (2003) surveyed auditors and other users and preparers of web-based business reporting to assess which types of e-disclosure they found more or less useful. Debreceny and Gray (1999) looked at firms' posting of auditing reports on the corporate website. Lymer and Debreceny (2003), meanwhile, raise the issue of how audit and assurance reports should be provided for financial information that is prepared electronically (e.g., via XBRL) and/or made available on the corporate website. Two studies have also explored issues and consumer preferences surrounding e-businesses' use of WebTrustSM, a system designed to provide assurance regarding firms' security and business practices (El-Dyasty, 2004; Houston & Taylor, 1999).

2.62 ***Information entrepreneurs and information intermediaries.*** The diffusion and increasing sophistication of new media has also led to the development of new, virtual forms of organizations along with the rise of new types of market actors. In the charitable contributions market, an especially interesting group of new media-based information entrepreneurs can be seen in the case of two increasingly influential charity ratings agencies, Guidestar and Charity Navigator. Gordon, Knock, and Neely (2009) found evidence of a relationship between ratings downgrades and upgrades on Charity Navigator and subsequent levels of contributions a charity received. It would appear that these website-driven organizations have managed to become influential information intermediaries in a relatively short span of time. Plausibly, analogous forms of information intermediaries and information entrepreneurs are growing more influential in the capital markets arena as well. However, they are waiting to be studied.

2.63 ***Grassroots CSR and anti-corporate movements.*** The flip side of firms' increased ability to selectively disclose and disseminate information, mobilize supporters, and manage impressions and expectations is that the same tools are available to those who are critical of the firm's financial, sustainability, or social responsibility efforts. Such efforts can range from "grassroots accountability" efforts and long-standing professional change movements, such as the social accounting movement (Gray, 2002), to stridently anti-capitalist and anti-corporate movements such as the "Battle for Seattle" or "Occupy Wall Street" (see Twitter hashtag *#OWS*).

To date, there has been little accounting research on anti-corporate mobilizations, on the use of accounting information against the firm's interests, or on online-based social movements dedicated to new forms of accounting systems. However, one early study examined the ability of the Internet to help activists struggle against corporate "irresponsibility" (Coombs, 1998). The initial evidence suggests the Web has greatly expanded the mobilizational capacities of interest groups and socially minded actors. In the absence of focused research, however, we do not know whether and how such movements are influential in firms' information environment. A more complete understanding of such actors would benefit from institutional, social movement, and social change theoretical perspectives.[3]

2.7 What do We Know? A Summary of Current Understanding and Ongoing Debates

From the above studies, we now know something about the new forms of technology and virtual communities in which market participants are engaged. We know something about the actors involved. We know something about their motivations. And we know something about the market effects of the information they produce and disclose online. There are a number of issues and debates that cut across these areas; I will summarize here several of the most important. acceptance

2.71 ***Is new media content "informative?"*** The information perspective (Ball & Brown, 1968) would be concerned with whether new media assist in the efficient allocation of capital. What do the collective evidence suggest? No categorical statement can be made. In certain contexts, such as recommendations by influential bloggers (Chen et al., 2011; Fotak, 2008), the evidence (absence of price reversals in the weeks following publication) suggests market participants do find such analyses informative. The evidence is mixed, however, with respect to the content of corporate Internet reporting and stock-related message boards. Not surprisingly, given the quick price reversions, message board and email spam manipulation are not informative (Böhme & Holz, 2006; Frieder & Zittrain, 2006), at least for sophisticated investors; instead, manipulation tends to generate "noise trading." There is also growing doubt that whisper forecasts contain useful information (Brown & Fernando, 2011). On the other hand, recent evidence (Sprenger & Welpe, 2010) supports the idea that, in the aggregate, stock-related messages on Twitter are value relevant. However, a key issue that needs to be addressed is whether the phenomena studied above deal with new types of *content* or simply new forms of *media.* With notable exceptions (e.g., Blankespoor et al., 2010), most existing research has ignored explicitly addressing this issue.

[3] For instance, social change scholars note that re-alignments of societal values do not happen automatically upon demographic shifts or the introduction of new technologies. Instead, groups of "critical communities," or small, self-aware, and "mutually interacting" groups that "seek acceptance of a new conceptualization of a problem" (Rochon, 1998, 22-23) play a key role in the process by formulating a critical perspective on a given societal "problem" and generating the solutions, ideas, value perspectives, and movements that ultimately push for relevant social, political, and economic change. Often, a critical community will coalesce around ideas generated by a single powerful work, such as Rachel Carson's *Silent Spring* (Rochon, 2001), at other times from the collection of ideas of a specific group of activists, or a large-scale protest event such as *Occupy Wall Street*. Through the development of their own networks and channels of communication (e.g., periodicals, virtual communities), critical communities begin to debate the issues, reframe problems, formulate new perspectives, and ultimately seek broader recognition of their critical perspective. If successful, the end result is a change in societal values.

Overall, new media appear to be a key, growing part of firms' information environment. They collectively offer information, news, opinion, reports, analyses, and stock recommendations. Websites, blogs, message forums, and social media can essentially be viewed as "alternate" forms of information that supplement, and in some cases supplant, traditional sources of information. However, we have nowhere close to a complete understanding of the extent to which specific types of content contain value-relevant information. For instance, it is likely that online information that is broadly available and easy to process is incorporated quickly into market prices. Almost certainly, there is little opportunity for arbitrage based on the information that is available on sites such as *Yahoo! Finance,* including news headlines, financial statement information, analyst downgrade details, or SEC filings. Consequently, under what conditions does accounting information generated or diffused via new media have a bigger or smaller impact? For instance, do alternate forms of information have a bigger impact when there is less consensus among sell-side analysts? Do alternate forms of information have a bigger impact with respect to "neglected" firms? And are there certain contexts in which new media serve to decrease specific forms of information asymmetry? These and other relevant questions remain to be addressed.

2.72 ***Democratization of information.*** From the above studies we can infer that the widespread use of new media has generated an explosion of readily accessible information. As the transaction costs have plummeted, the processes of production, acquisition, processing, and diffusion of information have all been democratized. There are two broad driving forces behind this democratization of information. On the consumer side, the Internet has not only provided citizens with important new ways of shopping, working, socializing, and playing (Horrigan & Rainie, 2002), it has also become "a mainstream information tool" (p. 2) that citizens, consumers, donors, and investors use to gain access to whatever information they deem important. The incredible accessibility of information accompanying the spread of the Internet has effectively fostered the demand from consumers, investors, employees, and others for information on firms' products, services, organizational operations, practices, finances, performance, governance, and community, social, and environmental impact. On the company side, in turn, the near-universal adoption of websites as a vital business tool for bricks-and-mortar establishments has led to the explosion of firm-related Internet content available to consumers, investors, and other interested parties.

What we do not have a good sense of is the extent to which investors and other stakeholders are better informed as a result of the broad availability of information. It is plausible that, in many contexts, investors are suffering from "information overload." There are thus two potentially useful avenues of research. First, studies could target specific types of new media sites and attempt to isolate the increase or decrease in investors' level of information; survey research might be especially useful in this context. Second, scholars could take a longer-term perspective and attempt to see whether the use of new classes of digital communication technologies has led to broad changes in investors' average level of knowledge.

We would also benefit from studies that explore informational micro processes. We now know that the costs of production, acquisition, and dissemination of information have dropped substantially. However, complicating any inferences is the fact that the actors involved in these information processes are embedded in complex virtual networks through which the information must flow. Not only does this affect the speed and reach of accounting information, it affects how such information is transformed and aggregated along the way. Much work remains to be done in this area.

2.73 ***New actors, new phenomena.*** Building on the democratization of information are new forms of actors who have come to fill the "information vacuum," including amateur analysts, spammers, information entrepreneurs, XBRL International, and others. The Internet era has also seen the emergence of a variety of new and important models and modes of firm–market communication and in the preparation, use, dissemination, and analysis of accounting information. As summarized in Figure 1 and seen in the above review, many of the actors and phenomena involved in the production and use of new

media-generated accounting information have not been studied extensively. Consequently, in the following section I point out some of the most promising areas for future research.

3.0 Limitations, Promising Theoretical Directions, and Suggestions for Future Research

3.1 The Quality and Impact of New Media Research in Accounting: A Key Limitation

There have been only four articles total in this field that have been published in the mainstream top 5 accounting journals, one each in *TAR, JAE, CAR,* and *AOS* (Ahmed, Schneible, & Stevens, 2003; Bagnoli et al., 1999; Hodge et al., 2004; Unerman & Bennett, 2004), which have studied, respectively, the effects of online trading, whisper forecasts of earnings per share, search-facilitating technology and transparency, and dialogue and accountability. Given the explosion of new media research in other fields (linguistics, communication, information systems, public relations, etc.), there would appear to be substantial normative pressures working against such studies. Of these pressures I would presume the following to be the most important.

First, new media are "new." Scholars working within this area need to strive to "make the case" that new media-based studies, and new media-based variables, are worth examining. Second, the dominant stream of research in accounting is capital markets-based financial accounting. The vast majority of empirical research published in this domain rely on secondary data provided by the Wharton Research Data Services (WRDS) databases. Unless new media-based variables were to be made available via WRDS, scholars who publish in the capital markets area are not likely to use them. Third, there is the quality issue alluded to earlier. Many of the existing new media studies, especially but not exclusively in the IFR area, have not been high quality. There needs to be a more consistent effort by scholars working in this domain. Of course, there could be a selection bias: those budding scholars who are more skilled, more highly trained, or care most about career advancement will on average be more likely to pursue mainstream accounting research.

3.2 Sentiment and Behavioral Finance

In two influential studies, Tetlock and co-authors (Tetlock, 2007; Tetlock, Saar-Tsechansky, & MacSkassy, 2008) have examined media pessimism using a simple algorithm based on the proportion of words in firm-specific media reports that have a "negative" connotation. In the first article, Tetlock finds that pessimistic content in a popular *Wall Street Journal* column leads to short-term decreases in stock prices "followed by a reversion to fundamentals" " (p. 1540) and also leads to increased market volume. He infers that this is consistent with "noise trader" and "liquidity trader" hypotheses. In the second, Tetlock et al. conclude that pessimism in firm-specific news stories "can be used to predict individual firms' accounting earnings and stock returns" (p. 1437), and that "…linguistic media content captures otherwise hard-to-quantify aspects of firms' fundamentals, which investors quickly incorporate into stock prices" (p. 1437).

Given the enormous scale of textual data available electronically, scholars can seek to employ similar linguistic strategies for extracting investor and analyst sentiment. Sprenger and Welpe (2010), in a recent working paper, have taken a strong first step in this direction by employing sophisticated computational linguistics techniques to measure investor sentiment. Such techniques could also be used to tap the potential "political cost" (Zimmerman & Watts, 1978) facing specific companies through the analysis of content reflecting popular and regulatory sentiment. Overall, there are significant opportunities to build on research in behavioral economics and finance (Camerer, 1987; Lee, Shleifer, & Thaler, 1991) by investigating the way that sentiment, rumors, and cognitive biases play out online.

3.3 Investor Reaction and Firm–Market Interactions on Social Media

Despite the explosion of firm and investor use of social media, only a handful of working papers have begun to explore this area (Blankespoor et al., 2010; Chen et al., 2011; Sprenger & Welpe, 2010). The possibilities for research using Twitter are especially promising. There are several specific features of Twitter that are worth highlighting for their impact on accounting and the capital markets. First, on Twitter, investors and firms obtain and can react in a real-time fashion to live streams of accounting information. Second, these real-time reactions can—given the nature of the social networking applications—spread rapidly to wide-ranging networks of investors. Third, in the aggregate, the information that is diffused through these investor communities in near-real time can potentially have a market impact on any given equity; it is likely that such effect is stronger for firms situated in poorer information environments (Blankespoor et al., 2010). Fourth, Twitter is unique in allowing firm–investor interactions. Websites and blogs are one-way forms of communication (firm → investor), and the Internet message boards that have been the subject of considerable prior research are many-to-many (investors only). On Twitter, firms have the potential to directly engage their investor community, and this firm–investor communication might, among other things, potentially mediate the relationship between investors' dissemination of information and information asymmetries in the market. Overall, the widespread use of Twitter by both firms and investors, combined with the social networking element of the platform, uniquely allows for the analysis of firm–investor interactions and communications and the effects of these interactions on the capital markets. The research possibilities are profound.

3.4 An Institutional Perspective: Context and Change

The great majority of the papers covered in this review have implicitly assumed an "equilibrium" in the markets. There has been substantial interest in neither the institutions that govern the use and outcomes of new media nor the ongoing processes of market, institutional, and societal change (North, 1991). An institutional approach would, among other things, focus our attention on the context of new media and accounting information, on the actors, norms, and organizations situated within that context, and on the relationships and interactions among actors. Such research would also seek to examine what the new "rules" and "norms" are, as well as which organizations and institutions, and which types, are on the ascendancy. In this section I summarize the studies that shed light on the institutional context and changes that are occurring as a result of the advent of new media, and suggest areas where future research could build on these perspectives.

3.41 How have new media changed market behavior? A handful of relevant studies have concentrated on the changes in investor behavior wrought by new media. For instance, Choi (2002) found the implementation of Web-based trading channels in a large corporate 401(k) plan increased the frequency with which investors conducted trades. Ahmed, Schneible, and Stevens (2003) found evidence that the advent of online trading has led to an increase in the number of naïve traders. Both studies shine a primarily negative light on the effects of Internet trading on investor behavior. To help counteract investors' predilections toward unhelpful trading behavior, research should strive to incorporate perspectives from the psychological and behavioral schools. Regulators and plan administrators should seek to design control systems that help investors reach their investment goals by minimizing excessive trading and other unproductive behaviors.

Market change is also evident in the near-universal use of corporate websites for disclosure. Nearly all have an "Investor Relations" section. The norm of corporate website disclosure has effectively produced institutional isomorphism (DiMaggio & Powell, 1983) with regard to such practices. This is just one indication of the way the spread of new media is generating new norms and "ways of doing things" when it comes to firm–market communication. Future research documenting such norms would provide a deeper understanding both of how market behavior has changed and where it is likely headed.

3.42 ***Change in professional identity and practices.*** Suddaby, Saxton, and Gunz (2011) are working on an analysis of how new and social media (specifically, websites, Twitter, and Facebook) are fostering change in the professional identity of accounting professionals. Drawing on communication (Carey, 1989; McLuhan, 1964) and institutional (DiMaggio & Powell, 1983; Greenwood, Suddaby, & Hinings, 2002; Meyer & Rowan, 1977) theories, the authors argue that, "the adoption of new communication media by accounting firms has initiated a form of institutional change in the discourse of professional identity of accountants" (p. 2). In effect, new media (the technologies of communication) represent a mechanism of institutional and identity change. Preliminary findings suggest new media has triggered a change in the Big 4's differentiation strategies that contrasts to "the traditional model of promoting common levels of professionalism across firms" (p. 3). At the intra-organizational and individual levels of analysis, the authors also document the emergence of the "celebrity professional." Finally, at the field level of analysis, the authors find an absence of traditional elements of professional discourse pertaining to "ethics, values, and normative obligations" (p. 3).

Additional research should be conducted to help shed light on the changes that are occurring more broadly in the accounting profession, not only in professional identity but in professional practices. For instance, consider XBRL. If XBRL continues to gain prominence, the information-collection, information-processing, and analysis abilities of users of financial statement information could expand dramatically. XBRL International would in the process gain prominence as a key actor in the financial reporting environment, insofar as it would be defining the information elements. Those who would "lose" from greater use of XBRL are those involved in the *manual* collection, processing, and analysis of financial reporting data employed in the IT and financial services sectors, as well as some of those who are involved in the preparation of financial reports, including the accountancy software industry. The momentum will generally shift from those who can collect and process information toward those who can *analyze* the information. In terms of concrete changes on the market, the more widespread use of XBRL should allow for greater speed in processing information as well as increased accuracy of information. The result should be modest improvements in the efficient allocation of capital.

3.43 ***"Winners" and "losers" of new media-driven change.*** The above discussion of XBRL implicitly outlines potential "winners" and "losers" in an era where accounting information increasingly flows through new media channels. In examining new actors and online practices, the focus of almost all existing research is on the "winners" of institutional change. Research still needs to be done on the "losers" of the ongoing change processes. For instance, could the rise of "amateur analysts" could be considered an attack on the interests of professional analysts?

Taking the issue more broadly, scholars should examine how new media are effectuating change at the sectoral and societal levels. For instance, in the nonprofit sector, the rise of powerful new ratings agencies such as Charity Navigator are playing a role in mediating the nonprofit–donor relationship. Moreover, Charity Navigator could be considered a type of "accountability entrepreneur" in terms of its advocacy of a specific form of charitable accountability and its attempts to coerce nonprofit organizations to buy into its rating system. The more organizations Charity Navigator is able to bring into its fold, the more influential Charity Navigator's form of accountability becomes. Institutional studies of this and other new phenomena could help us understand who wins and who loses with the rise of new norms, frameworks, and ways of making sense of online accounting information. The role of "information entrepreneurs" broadly conceived could be especially useful. At the most general level, what would be helpful at this point in time is the attempt to "map" the field (Bourdieu, 2005) of new media and accounting information. Who are the powerful actors in this field, what are the norms that are shaping their interactions, and how are these norms and dynamics changing?

3.5 Network Analysis: Inter-Relationships among Actors and the Flow of Accounting Information

The capital and charitable contributions markets alike have experienced a burgeoning number of interested parties who are interacting online to share information related to firm performance. Virtual networks of investors, analysts, firms, regulators, information intermediaries, donors, ratings agencies, and the media have come to play a key role in the capital markets as well as in the charitable contributions market. Despite the impressive proliferation of these networks, academic researchers have yet to seriously ask whether and how they are important in the functioning of the market.

In line with the growth of online networks has come an array of sophisticated social scientific tools and methodologies for analyzing the structure of these virtual networks and communities. A recently published study in the *Journal of Business Ethics* (Fieseler et al., 2010) employed social network analysis to explore the structural embeddedness of a corporate blog devoted to CSR issues in a network of interested stakeholders. Save for Das and Sisk (2005), the finance and accounting communities have yet to employ any of these approaches to studying the flow of accounting information through new media. The goal should be to employ social network analysis tools, which have been successfully used in other accounting contexts (Richardson, 2009) to examine the importance of virtual networks in determining market efficiency and the information asymmetry between insiders and outsiders.

3.6 The Flow of Information through Networks: Market and Investor Information Processes

One exciting area that could benefit from network approaches is the nature of accounting information processes. I outline research possibilities on three inter-related topics.

3.61 ***How and why does information flow through networks?*** Prior research has been absorbed by the type and quantity, and to a lesser extent the quality, of the information that has been disclosed. What has not been studied explicitly is the process by which online information spreads to market participants, including the question of the speed and paths of information flows through communities of interest. The growing popularity of the micro-blogging platform Twitter will likely change this. Notably, such research would run counter to the typical strong- and semi-strong forms of the efficient markets hypothesis (EMH). The EMH posits the key element of information is its disclosure; whether and how this information is aggregated, disseminated, or flows through a network, is an "automatic," almost immediate process that is not important for understanding market efficiency.

I argue, in contrast, that with such a substantial proportion of firm–market communication occurring online, and with much of this communication being situated within social networks, that the relationships of network actors and the determinants of information flow through key networks are both worthy of concentrated attention. There are some who are similarly interested. For instance, in a recent working paper, Hirshleifer (2008) argues that scholars should pay more attention to investors' degree of social influence as a determinant of thought and behavior contagion in investment communities. Such insights invite scholars to combine theories from psychology and sociology with the methods from social network analysis to bring fresh evidence to bear on important accounting and capital markets phenomena.

Scholars might investigate, among other questions, which types of online network activity are value relevant. For instance, how does the market react to the postings of high-profile bloggers? Also valuable would be examinations of whether various sub-sets of virtual networks—for instance, online peer-evaluated "Gurus"—are more relevant than amateur analysts, or whether in fact the blogosphere's "crowd" (Surowiecki, 2004) is wiser still in predicting market outcomes. Beyond purely "informational" perspectives, there is ample room for studies of how accounting-related rumors, hoaxes, lies, opinions, and sentiments spread through virtual networks and ultimately affect market participants.

3.62 ***Dissemination and aggregation of information.*** The question of information flow just addressed deals with the paths that information takes through a network. There are other aspects of network-situated information that are also worth exploring. To start, scholars have begun to show interest in the processes of the *aggregation* and *dissemination* of firm-relevant information. Bushee, Core, Guay and Hamm (2010) argued that the increased dissemination of information provided by more extensive firm coverage in the business press can reduce information asymmetries. Blankespoor et al. (2010) make a similar argument with respect to firm dissemination of information on Twitter. It is likely that such a "dissemination effect" is occurring in other venues in different ways. Scholars could investigate these effects. For instance, it would be interesting to know, first, whether and how investors react to changes in firms' information environment by increasing or decreasing their level of online information dissemination activities; and, second, in whether—and under what conditions—this investor activity can reduce information asymmetry. Overall, there is a need for in-depth research on the micro-processes of information diffusion and use.

3.63 ***"Demand for information" and "investor attention."*** Two final, related concepts that are worthy of attention are "investor attention and "demand for information." The logic underlying both concepts is that investors will actively seek—as well as produce—company-specific information in response to specific firm-related accounting events. To date, our understanding of the specific conditions that spark online information seeking and production, and the types of online information investors pay attention to, is not deep. Scholars will likely have to get creative to find new ways of studying these issues. An interesting recent study by Rubin and Rubin (2010) shows promise. The authors found a novel way to address the issue of the frequency with which investors are processing company-specific information—through coding the frequency of company-related Wikipedia edits. They find this proxy for information processing is associated with investors' and analysts' level of information about the firm, as indicated by such measures as the bid-ask spread and the dispersion of analyst forecasts.

3.7 New Media and Management Accounting

Finally, I have not discussed save in passing the flow of information *within* the firm—and this could be an especially promising area for future research. Given the dominant capital markets focus of research in accounting journals, the present review effectively amounts to a review of financial accounting by firms and the use of accounting information by actors outside the firm (e.g., donors, regulators, and investors). However, there is a separate stream of new media research that is also relevant to accounting scholars: the examination of the use and implications of digital communication technologies on management accounting-related issues, such as managerial control systems and enterprise resource planning systems. Such research is understudied in the accounting literature (though see Booth, Matolcsy, & Wieder, 2000; Scapens & Jazayeri, 2003; Rom & Rohde, 2007; among others), and chiefly occurs in journals in operations research (Hendricks, Singhal, & Stratman, 2007), information systems (Hunton, McEwen, & Wier, 2002), corporate finance (Lindley, Topping, & Lindley, 2008), and communication (Kumar & Van Hillegersberg, 2000; Soh, Kien, & Tay-Yap, 2000).

4.0 Summary

This study adds value to the literature on new media and accounting in several ways. First, it provides a framework for understanding the current research that focuses on the actors involved in the production or use of accounting information. Second, it summarizes the current state of knowledge with respect to the informativeness of new media-based accounting information, the democratization of market-relevant information, the new roles of virtual actors, and the ongoing institutional changes affecting the generation and use of online accounting information. Third, the paper identifies a number of research areas that could prove valuable. The hope is that this paper serves as a useful resource for those intending to pursue future research in this exciting new area.

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Appendix: Correspondence Analysis

Each accounting article included in the critical review was summarized along two dimensions: 1) the actor that was the primary producer of the accounting information and 2) the specific medium studied. For instance, an article on Internet financial reporting on for-profit firms was assigned a score of "Firms" for the producer of information and "Website" for the medium. This process was repeated for each article. This information was then utilized in a *symmetrical correspondence analysis*, with the rows representing the producers, the columns representing the media, and the cells containing the number of articles. The figure below shows the graphical output of the correspondence analysis. The way to interpret the graph is that producers (represented by blue dots) that have more similar "profiles" in terms of their media focus will be situated closer together; similarly, media (represented by red triangles) that have more similar "producer" profiles will be closer together.

Specifically, through a visual inspection of this plot we can see several salient features of the existing new media and accounting literature. First, studies of email are associated with analyses of manipulation (i.e., email spam). Second, studies of investors are related to analyses of message board content or analyses of general studies of the effects of the Internet. Third, studies of blogs are closest to freelance and amateur analysts, indicating the sole focus of blog studies on amateur analysis. Fourth, there is a cluster of work on auditors, nonprofits, governments, and for-profit firms that have similar media foci (XBRL, Twitter, Websites). The plot shows analogous information regarding what has *not* been studied. There are no studies, for example, of companies' use of blogs. Nor do we have studies about how, for instance, managers or professional analysts are using new media in their research or decision-making. This plot effectively suggests additional gaps in the literature that complement those highlighted in Figure 1 seen earlier.