E-COMMERCE AND THE NEWPAPER INDUSTRY: DETERMINANTS TO FIRST-MOVERSHIP

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ABSTRACT

This paper shows there is at least one determinate for newspaper firms adopting e-commerce as a first-mover strategy during the period 1994-2006. One hundred two competitive newspaper regions were examined to determine if there existed factors related to a newspaper firm being first to adopt e-commerce in the given region. While size and age of the firm were examined, only size proved to be a significant factor in a firm being a first-mover. The newspaper industry is rarely studied and this study contributes to the understanding of that industry. In addition this study is unique in since combines the topics of e-commerce and first-mover theory with the newspaper industry.

INTRODUCTION

Technology has the capability of influencing everything in management. New technologies can lead to environmental change (Carroll, 1994) and can lead to a change in industry structure (Porter, 1985). New technology can also lead to a change in competition in the industry, frequently requiring firms to change strategy in order to survive (Nelson, 1994). And, of course, new technology adoption can reach down to the firm level and have an impact upon performance (Zahra & Bogner, 1999). The implications of technology in an industry may be far reaching. One such technology with such implications is e-commerce.

E-commerce technology was supposed to revolutionize business (Boudreau, Loch, Robey, & Straud, 1998; Kambil, Nunes, & Wilson, 1999; Weil & Weil, 1999). But the 21st century and fall of many Internet firms produced skepticism among many (Coltman, Devinney, Latukefu, & Midgley, 2001; Moon & Frei, 2000; Rosen & Howard, 2000; Shapiro, 2000; Storey, Straub, Stewart, & Welke, 2000; Walton, 2000). After exuberance regarding the Internet waned, e-commerce is still a factor to be considered and studied (e.g. Al-Hudhaif & Alkubeyyer, 2011; Lu, Li, Zhang, & Rai, 2014). This consideration by managers included not just setting up a website, but type, content, and management of the website. With the introduction of this sales medium, advertising medium, distribution channel, and customer relationships channel, managers still have a host of questions to consider, not the least of which is how an industry changes with the use of e-commerce.

This paper combines first-mover advantage theory and e-commerce theory and applies them to the newspaper industry. Two hypotheses are developed to test precedents to being a first-mover. While first-mover advantage and e-commerce have both been well researched, the two have not often been combined to research the newspaper industry. Duvakova, Andreeva, Duvalova, and Ivasiv (2016) and Makadok (1998) deal with e-commerce and first-movership in the banking industry and is the only published work to date to examine these subjects together.

Two other studies (Borenstein & Saloner, 2001; Gregorio, Kassicieh, & de Gouvea Neto, 2005) have touched on the two subjects but did not focus upon them. This paper looks specifically at the relationship between first-movership and e-commerce in the newspaper industry.

LITERATURE REVIEW

First Mover Advantage

Although innovations can come from inside and outside of an industry, this study focuses on innovation that is developed outside the market and is brought into many markets by first-movers during a specified time period. There appears to be widespread consensus about the definition of first-mover. This paper will use the definition of first-mover as the first firm to offer a distinctively new product to the market (Palalic & Busatlic, 2015; Covin, Slevin, & Heeley, 1999; Robinson & Fornell, 1985).

The first issue to be addressed is whether first-mover advantage exists. It has been noted that first-mover advantage is not available for all industries (Kerin, Varadarajan, & Peterson, 1992). First-mover advantage does exist in the banking industry (Makadok, 1998), it may be less likely to occur in the service industries (Ketchen, Snow, & Street, 2004; Song, Di Benedetto, & Zhao, 1999), and Nikolaeva (2005) found no evidence of first-mover advantage among the retailers. Robinson (1988) concludes that first-mover advantages exist in consumer markets when a product has a low purchase amount while in industrial markets the first-mover advantage increases as the purchase amount increases. Cui and Lui (2005) studied multinational firms in an emerging market economy and found first-mover advantage is more pronounced in emerging markets. This latter advantage is also echoed by Wang, Hermens, Huang, and Chelliah (2015).

There are factors influencing the magnitude of first-mover advantage. In a consumer market moderate frequency of purchase contributes to an increase in first-mover advantage (Kerin et al., 1992; Porter, 1983). Frequent repetitious buying carries with it risk of the consumer trying something else. However, when the frequency of purchase decreases, a buyer must stay with a purchase decision longer and, hence, will be less likely to switch due to the risk involved. Thus, markets such as with newspapers where subscriptions are inexpensive and are purchased with moderate frequency should have higher first-mover advantage than other markets where purchases are more frequent. Finally, in strongly competitive markets, first-mover advantage seems to be greatly magnified (Bell, 2015).

The size of a firm may be relevant to first-mover advantage. Smaller firms seem to be the most likely to be first-movers (Lowe & Atkins, 1994). The rationale behind this is that small firms do not have many chances to try to overtake larger firms. When an innovation becomes available, the small firms are more likely to utilize this innovation to attack larger firms and gain an additional part of the market held by the larger firms.

The most comprehensive study to date on first-mover advantages was conducted by Gomez-Villanueva and Ramirez-Solis (2013). These authors create a comprehensive model of factors that may determine whether there is a first-mover advantage in a particular situation. Such determinants include market orientation, technology orientation, and the dynamic capabilities of the firm to name just a few.

E-Commerce

When viewing the first dimension of e-commerce as an electronic transaction, one finds the definitions to be similar. The broadest definitions of e-commerce refer to any commercial transaction that is handled electronically where economic value is exchanged (Sterrett & Shah, 1998) and to any commercial transaction (Lo & Everett 2001). The preceding views coincide with other definitions, namely, electronic exchange transactions (Wood, 2001) and electronic exchanges of value (Igau, Kassim, Tahajuddin, Ndubisi, & Hassan, 2011; Senn, 2000; Standifird, 2001; Wang, Head, & Archer, 2002). Implicit in these views is that e-commerce includes electronic transactions that are conducted through some form of automated, electronic network.

A second dimension of the e-commerce definition is an electronic exchange of value. Some definitions only view the transaction as an exchange (Oelkers, 2002; Wood, 2001) acceptable to all parties involved. A few speak of the transference of value through electronic means (Rosen, 2000; Standifird, 2001). Nevertheless, the transfer of value may be an integral part of e-commerce.

The third, and arguably most important, dimension of e-commerce is technology. The creation of computers and the development of sharing data through communication lines are at the heart of e-commerce. Firms have set up electronic data interchanges (EDIs) for the purpose of replenishing inventory efficiently and quickly (Johnston & Mak, 2000). But beyond material acquisition, this technology allows the timely collection of information previously not possible. E-commerce encompasses the entire realm of computing that involves transfer of value, transmission of data, and collection of data for the purpose of transacting business.

This paper makes the following definition for e-commerce: the electronic contracting for the exchange of value through the use of computing and communication technology. This definition not only incorporates the major aspects of the above-mentioned definitions but also is applicable to the current study. The major themes of electronic contracting, the exchange of value, and automation found in other definitions are included. This definition also confines e-commerce to the transaction level and, importantly, is consistent with other literature that provides definitions of e-commerce (e.g. Pillutla & Allison, 2002). Similarly, e-business is defined as a firm employing e-commerce as a significant part of its operations.

Electronic sales technology created a brand new type of product with very interesting ramifications: digital goods. Sales of digital goods include music, movies, books, education, software, documents, and, in particular, newsprint. One of the advantages to selling these digital goods has been that although development costs may be high, reproduction costs are extremely low (Krishnamurthy, 2003). Thus, once one product is developed, it could be reproduced repeatedly without much human intervention. From a cost perspective of the firm, sales of digital products have virtually no variable cost, reducing a firm's operating costs.

Much of the same technology that created the digital product also created a new distribution channel for those products (Afuah & Tucci, 2001; Krishnamurthy, 2003). Afuah and Tucci (2001) posited this new distribution channel can be a replacement of an existing channel or an extension of a currently existing channel. A customer who wants to view news online need only access a news service website. Firms operating in the industries capable of supporting digital distribution realize significant savings in sales functions.

E-commerce, when applied to digital goods, could increase sales for a firm. Digital goods can be delivered instantly and without significant delivery charges. This creates extensive value for the purchaser of these products, possibly expanding the firm's market reach. However, a key concern has become the protection of the digital goods and the confidential information obtained through the sale of such goods (Neal & Ilsever, 2016).

The Newspaper Industry

This paper examines the effect of e-commerce upon newspaper firm size during the period 1994-2006. Firm size here is measured by number of subscriptions. There is an important distinction here between subscriptions and readers and the distinction points to a critical attribute for online news publishers. The number of subscriptions generally refers to those who have paid to have a print version delivered to a home or office. The number of readers in most cases may be much, much greater than the number of subscriptions. This is due to online versions offering free access to the publications. However, free access to the online content of a newspaper cannibalized, in part, the subscriptions of some newspapers and could explain part of the declining circulation through 2002 (Fitzgerald, 2003).

Management research in the newspaper industry has not been overwhelming. A few research articles to date have directed their attention toward this industry (e.g. Carroll, 1984a, 1984b; Carter, 1984; Gilbert, 2001; Gomez-Mejia, Nunes-Nickel, & Gutierrez, 2001; Wishart, Elam, & Robey, 1996). One paper studied the increased concentration in the newspaper industry (Carroll, 1984b). One examined learning organizations and uses Knight-Ridder, the newspaper holding company, as the subject of a case study (Wishart et al., 1996). Two studies examined succession and family control of a newspaper firm (Carroll, 1984a; Gomez-Mejia et al., 2001). Two more looked at technology's effect on a newspaper organization, specifically computerization (Carter, 1984) and the industry's response to the Internet (Gilbert, 2001). Fan (2013) examined effects after newspaper firm ownership changes and consolidation in the industry. Finally, research has shown that regional newspaper firms are hesitant to utilize the Internet beyond the publishing of content for subscribers (Graham & Smart, 2010).

Two research pieces examined the role technology has had on the newspaper industry. The first of these, Carter (1984), examined the introduction of computers into the industry and the corresponding effects. The research question was whether computerization as a predominant technology affected decision-making and the division of labor. One of the findings of this study was that computer technology, as used for decision-making and division of labor, was directly related to the tasks for which the computer was used. The size of the firm also moderated this relationship. Using data from the Editor & Publisher 1979 Yearbook, Carter (1984) also found that the structure of an organization depends upon the degree and type of computer applications as well as the extent of uncertainty in the environment.

The second study, Gilbert (2001), examined how technology can threaten the viability of a firm. For this case study, the researcher specifically examined how the Internet threatened the existence of the newspaper industry. Gilbert (2001) collected data from eight primary sites and ten secondary sites and the collection methods included interviews, observation, and archival documents. He chose the newspaper industry since disruptive technologies were present. Gilbert

(2001) concluded by stating the interaction of management's framing of the threat issue and organizational processes is a determinant of strategic commitment. He found that threat rigidity, formerly viewed from the individual level, was very much present on the organizational level. Although presented as such in recent literature, e-commerce is not a panacea. Much of the success of e-commerce adoption may depend partly upon individual and group decision making processes such as cognitive framing.

The newspaper industry has several properties that are desirable for researchers such as Carter (1984) and Gilbert (2001). Newspapers are one of the oldest commercial activities in this country. The industry also has seen much technological change, some of it threatening to the existence of the industry. Also, the many regional newspaper markets allow the simultaneous study of many markets simultaneously. Finally, the industry is not complex with regard to its structure of operations. This allows considerable control over extraneous variables in a research project.

HYPOTHESES

The adoption of e-commerce may have required changes in the structure and culture of the newspaper firm. E-commerce required a change in the technical infrastructure of the organization and, hence, an appropriate change in the structure of the firm (Turban, Lee, King, & Chung, 2000). In order for a firm to be successful through e-commerce, there should have been an alignment between its structure and strategy (Clark, Camplese, Camplese, & Thomas, 2001; Cohan, 2000). Also required by e-commerce is innovative thinking (Hoque, 2000) and a learning attitude (Tapscott, Lowy, & Ticoll, 1998). This thinking and attitude allowed for a greater ease of diffusion of e-commerce throughout the organization. Finally, in order to adopt e-commerce a firm must have the capacity to adapt to changes in a rapid and systematic fashion (Tapscott et al., 1998). Technology, in particular e-commerce, has rapidly changed and a firm must have the ability to stay ahead of the change. As a result, the culture of the firm should be one of sustaining change, understanding that a low-turbulence environment may no longer be possible (Cohan, 2000).

Larger firms have a tendency to require more complex forms of communication (Durkheim, 1933; Simmel, 1902; Spencer, 1898). However, early and honest communication was recommended for e-commerce adoption (De & Huefner, 1995; Singh & Waddell, 2004). As a result, in a larger firm a change toward e-commerce adoption needed to be communicated to many different individuals. Larger firms are also subject to greater formalization of behavior (Blau & Schoenherr, 1971; Caplow, 1957; Chapin, 1951; Gruskey, 1961; Pugh, Hickson, Hinings, & Turner, 1969; Tsouderos, 1955). Changing to an e-commerce system in a larger firm would have to go through a rather lengthy process of review and implementation. Both complex communication and formalization would have made the strategic choice of becoming an e-commerce first-mover very difficult because of the bureaucracy that permeates large firms (Haveman, 1993).

Following these arguments regarding what e-commerce requires, it was unlikely that a larger firm was the first-mover adopting e-commerce in a significant way. On the other hand, larger firms often feel the pressures to conform to external changes more than smaller firms

(Dobrev & Barnett, 2005). They also have greater resources that enable movement toward changing technology (Gomez-Villanueva & Ramirez-Solis, 2013; Haveman, 1993). However, neither of these things would have guaranteed that a large firm would become a first-mover. In spite of these factors, first-movers in a market tend to be smaller firms (Lowe & Atkins, 1994).

Size can be measured by the number of customers patronizing the firm, or market share (Porter, 1980). One measurement of size for newspapers is circulation. Many newspaper firms adopted e-commerce to increase subscriptions (Peng, Tham, & Xiaoming, 1999; Saksena & Hollifield, 2002). Thus, the following hypothesis is offered:

> *Hypothesis 1*   *In a given newspaper market, the smaller a firm's circulation when compared to the other firms in the market, the more likely that firm was to be a first-mover into e-commerce.*

E-commerce adoption required several changes in a newspaper firm. The very fact that a new technology was being introduced required that new skills indigenous to the firm be developed in order to push the firm past the traditions that may be embedded in the culture (Bovet & Martha, 2000). These resources are necessary to the success of e-commerce and essential for a first-mover. One prerequisite to adopting e-commerce successfully was to have good internal communication and a technical infrastructure (Lei & Slocum, 2005; Turban et al., 2000). When adopting a new innovation, all members from the organization and people outside the organization who are influenced by the innovation should have input to find the best possible way of implementation. This communication would need to be uninhibited and uncensored so as to not stifle new ideas. Another precedent for adopting e-commerce was an appropriate attitude by the firm towards innovation. Technology adoption required a learning attitude (Tapscott et al., 1998) and an atmosphere of inspired thinking (Hoque, 2000). Finally, a firm that was innovative in such ways as adopting e-commerce must have had the capacity to change systematically and perhaps rapidly (Tapscott et al., 1998). Computer technology changes extremely fast and an organization that cannot rapidly change with that technology may not have be able to become a first-mover nor be competitive in this arena.

One factor that may have played a part in a firm failing to have the above prerequisites and being a successful first-mover in e-commerce is firm age. As a firm gets older, the processes inside the firm, including communication, become more formalized (Hannan, Carroll, Dobrev, & Han, 1998; Scott, 1975). Inside an older firm, good ideas for innovation may have had to be channeled through layers of bureaucracy. Firm aging may have led to very rigid communication patterns and, consequently, may produce fewer innovations (Sorensen & Stuart, 2000), including innovations related to successful e-commerce adoption. Thus, an older firm is unlikely to be a first-mover with e-commerce.

As firms get older there is a two-pronged problem with organizational change. One prong is that the culture of an older firm guides it toward a stable system and discourages entrepreneurship (Danneels & Sethi, 2003; Jensen & Meckling, 1976) such as e-commerce. The firm as a whole attempts to maintain the status quo rather than changing with the external environment. The second prong is that the older a firm is, the more difficult it is for the firm to make changes (Dobrev & Barnett, 2005). The institutionalization of the status quo made it

difficult for an older firm to become a first-mover in adopting e-commerce. Weinstein and Standifird (2010) articulate this with the online book retailers where "experienced" firms could not break from the old cognitive patterns and utilize the Internet fully, giving the "inexperienced" firms a significant advantage.

In summary, in order for a newspaper firm to be a first-mover in e-commerce it must have had good communication and the ability to change rapidly. However, an older newspaper firm may have had a very rigid communication system that may stifle ideas while also possibly having a culture that discourages change. In light of this, the following hypothesis is offered:

> *Hypothesis 2*   *In a given newspaper market, the younger a firm is when compared to the other firms in the market, the more likely it was to be a first-mover into e-commerce.*

METHODS

Sample

The sample to be used to test the hypotheses came from the daily newspaper industry. One particular reason for selecting this industry is that newspaper organizations are less complex than other organizations allowing for the control of variables that would otherwise be factors (Gomez-Mejia et al., 2001). Next, first-mover advantage in the newspaper industry may be greater than other industries due to the inexpensiveness and moderate frequency of purchase of subscriptions (Kerin et al., 1992; Porter, 1983).

Several competitive markets in the United States were chosen for this study. The U.S. Census Bureau has divided the United States in statistical regions that are contained social and economic systems (OMB, 2004). Metropolitan statistical areas are economic areas have at least one urbanized area of 50,000 people or more. The micropolitan statistical areas are economic areas have an urban cluster area between 10,000 and 50,000 people. The combined statistical areas are larger groups of metropolitan and micropolitan statistical areas. Finally, the New England city and town areas are the same as metropolitan and micropolitan statistical areas.

These statistical areas have been chosen because they are defined based on social and economic ties in a community. Competition between newspapers is based on a geographic level and a news level. Newspapers in the same geographic area and covering the same local news are firms that compete. This is the very essence of the statistical area.

The source from which data for this study was gathered is the Editor & Publisher Yearbook for the years 1994 through 2006. This source has been chosen because is a standard reference tool for journalists (Weiner, 1975) and it contains the data that is needed for this study. The yearbook contains listings for all U.S. and Canadian daily papers as well as weeklies, special interest, and other types of papers. The data recorded for each daily paper consists of location, ownership group, circulation, prices, and commodity consumption (broken down by amount of newsprint, black ink, and color ink to name just a few). Many of these major categories are further broken down into subcategories.

A random sample of 200 metropolitan and micropolitan statistical areas were chosen for the study. The U.S. Census Bureau does differentiate between the two statistical areas in the

listing. However, when an urban region is over 2.5 million people, the metropolitan statistical area is subdivided into separate metropolitan subdivisions. In this case, these subdivisions served as the geographic division rather than the larger macrodivision. This provided assurance that the newspaper firms in the geographic region are indeed competing with one another. Since firm size is one of the variables under study and newspaper firm size is related to geographic population, the listing of statistical areas was stratified between large city metropolitan statistical areas, other metropolitan statistical areas, and micropolitan statistical areas. Once the stratification occurred, then a proportionate sample was randomly selected from each of the three statistical area groupings. A stratified random sample is recommended when three groups are being contrasted as in this case (Agresti & Finlay, 1997).

Once a statistical area is chosen, the newspaper firms inside of that statistical area are automatically chosen, creating a cluster sample. Cluster sampling is often used to select geographic regions for study (Agresti & Finlay, 1997). This sample allowed entire groups of competitive newspaper firms to be chosen so that first-mover status may be examined in relation to the other firms in that group.

Once the data was gathered, the statistical method for analyzing the data was logistic regression for both hypotheses. Logistic regression uses continuous, discrete, and categorical data as the independent variables to predict group membership, a categorical dependent variable (Allen, 1997; Tabachnick & Fidell, 2001). As a result, logistic regression can be used to predict whether a firm is a first-mover or later-mover based on the characteristics of the firm. All variables were placed into the logistic model and then were eliminated one at a time based on insignificance. Thus, Hypotheses 1 and 2 were tested at the same time.

The dependent variable for Hypotheses 1 and 2 was the categorical variable of mover status. For analysis, the variable was coded 1 for first-mover and 0 for other. The *Editor & Publisher Yearbook* annotates when there is an electronic edition. The firm with this entry showing earliest was considered the first-mover. In the case where two or more firms enter the same year, the firms were contacted as to the actual date of entry.

The independent variable for Hypothesis 1 is circulation. The *Editor & Publisher Yearbook* contains how many subscriptions each newspaper firm had for a given year. Since this study is only examining daily newspapers, when the subscription numbers for Monday through Saturday do not match the subscription numbers for Sunday, then the subscription number for Monday through Saturday were used. The number of subscribers in the year the first-mover adopts e-commerce were used.

The independent variable for the second hypothesis was firm age. Taking the year of e-commerce adoption by the first-mover and subtracting the date of the newspaper's establishment calculated firm age at the time of a first-mover's e-commerce adoption. The age of the firm at the time the first-mover adopts was used. For both hypotheses, the independent variables are those measurements that operationalize the constructs in the hypotheses. All other variables are considered control variables.

To capture differences in the dependent variables for both hypotheses, a variable for geographic region was created. Some parts of the country might have a cultural leaning toward reading newspapers while other parts may not. In addition, advertising prices might also be affected by geographic region. The U.S. is broken up into four regions: the North East, the

South, the Midwest, and the Pacific region. Dummy variables were set up for North East, South, and Midwest. A newspaper from any one of these regions got a 1 in the appropriate dummy variable. Firms from the Pacific region had all zeros in the dummy variables.

Another control variable was the size of the metropolitan/micropolitan statistical area. Two dummy variables were created. A metropolitan statistical area that does not contain a large city received a 1 in the first variable and a 0 in the second. A micropolitan statistical area got a 0 in the first variable and a 1 in the second. The metropolitan statistical areas containing large cities received a 0 in both variables.

Political affiliation of the firm at the time of first-mover adoption and at the time of the firm's adoption might have been a determinate in circulation. Thus, whether a paper claimed to be Republican, Democrat, or Independent might have influenced its subscribership. If an area were strongly Democratic and the newspaper were Democratic, the circulation might have been larger than if the newspaper were Republican or Independent. Thus, price might have been affected as well. As circulation changes, so does advertising since advertisers follow subscribers. As a result, dummy variables were created for Republican, Democrat, and Independent, with a 1 in the Republican variable representing a Republican paper, a 1 in the Democrat variable representing a Democrat paper, a 1 in the Independent variable representing an Independent paper, and zeros in all three to represent no information. This dummy variable was used only in Hypothesis 1.

Survivorship could be a variable influencing the study. If a newspaper firm did not survive to the second or third year after e-commerce adoption by the first-mover or did not survive to the second or third year after its own e-commerce adoption, only one or two year's data was possible. In this case, the existing data was used but two separate dummy variables, one for each case, were created to code as 1 if a firm fails to survive during the given period.

Another issue might have been a change in ownership during the period where e-commerce adoption occurred by the first-mover and during the period where the firm adopted e-commerce. In this case, the ownership for each firm at the time of e-commerce adoption was used but a dummy variable was created and coded as 1 when the ownership structure changes over the three years' data for circulation and advertising.

A factor that possibly affected circulation is the type of news service to which the paper subscribed. There were four main subscription services: Associated Press (AP), United Press International (UPI), Ganett News Service (GNS), and Reuters. A newspaper may have subscribed to any or all of these. A dummy variable was set up for each type of service. If the paper has that service, the variable corresponding to the service was coded 1. Otherwise, the variable was coded 0.

Analysis

The sample initially consisted of 200 randomly chosen metropolitan statistical areas, stratified by size. Six major metropolitan areas, 73 metropolitan areas, and 121 micropolitan areas were randomly chosen. The data collection for the major metropolitan areas and the sample portion for the metropolitan areas went as planned. However, few of the micropolitan areas had two or more competing newspapers. As micropolitan areas were eliminated from the sample and

replaced, the entire population of micropolitan areas was exhausted. From a population of 578 micropolitan areas, only 43 had two or more competitive newspapers. Thus, the sample consisted of 6 major metropolitan areas, 73 metropolitan areas, and 43 micropolitan areas.

Based on the information obtained from Editor & Publisher Yearbook, several of the statistical areas had two or more firms adopting e-commerce in the same year. In each of these areas, the individual newspapers were contacted by email and again by phone if there was no response as to the exact date a website was available. In several of the cases, a first-mover could be determined from the responses. However, in other cases the firms could not determine when the website first became available, did not answer the question at all, or were no longer a viable entity. This caused several entire statistical areas to be eliminated from the sample. Three of the major metropolitan areas were eliminated, 11 metropolitan areas were eliminated, and 6 micropolitan areas were eliminated from the study. This left 3 major metropolitan areas, 62 metropolitan areas, and 37 micropolitan areas left for the analysis.

When analyzing the correlation between the variables, it was found that the circulation of a firm prior to first-mover adoption of e-commerce was very highly correlated with the advertising rate prior to first-mover adoption. The Pearson correlation coefficient was used for this test and showed 0.942 which was significant at the 0.01 level. None of the other variables were highly correlated pairwise. Since the advertising rate was essentially duplicated by the circulation, this variable was dropped from the Logistic Regression test.

Logistic Regression analysis forms cells by combinations of the discrete variables, in this case the size of the statistical area, the ownership type, the geographic region, political affiliation, and types of news service subscriptions. However, the analysis loses much of its power if the expected frequencies of many of the cells fall below five. The rule of thumb is that all the expected frequencies should be greater than one and no more than 20% of the frequencies should be less than five. When the expected frequencies of the cells were examined, there were many with zero frequencies and many more with expected frequencies less than five. The problem variables were tracked down and the biggest share of the problem was created by the newspaper subscription control variable. Too many of the newspapers in the sample had no subscription service or a single service, making many of the cells zero. Thus, this control variable was worthless to the analysis and would only detract from the results. The variable newspaper subscriptions services were eliminated from the study.

The expected frequencies were run again and about 23.7% of the cells still had expected frequencies less than five. The size of the statistical area was creating the additional problem. To fix this problem the large statistical area and the regular statistical area were combined into one variable. Logistic Regression would then use a control variable that compared small statistical areas to other statistical areas. After this control variable was recoded, the expected frequencies met the assumptions of the test.

Logistic Regression requires linearity in the logit and is at the same time very sensitive to multicollinearity. When linearity was checked, all variables had a p-value greater than the standard of 0.0125 (Tabachnick & Fidell, 2001), showing that there was support for linearity in the logit. Both statistical tests, the full model and the reduced model, show linearity in the logit. When the multicollinearity diagnostics were run, it was found that the political affiliation control

variable was a linear combination of the geographic factors. This made political affiliation redundant in the study and, hence, was eliminated.

The final model to be tested consisted of the dependent variable of first-mover status and the independent variables of age of the firm, circulation prior to first-mover adoption, and type of ownership of the firm, along with the control variables of statistical area size and region. After logistic regression is performed, the first check is to see if the full model is significant when compared to a constant model. This is done by subtracting the χ^2 value of the full model from the χ^2 value of the constant model and then determining if the result is a significant χ^2 value. The full model had a χ^2 value of 310.01 and the constant model had a χ^2 value of 344.703 giving an extremely significant difference of 34.693 ($p<0.001$). The full model and the reduced model had results that were very similar.

The next step is to examine each of the variables to determine which are significant. Of the three independent variables tested, circulation showed to be strongly significant while the other two were not significant. The full model and the reduced model have little difference. The reduced model results are shown in Table 1.

Table-1
RESULTS FROM THE FIRST LOGISTIC REGRESSION TEST

Parameter Estimates

First Mover		B	Std. Error	Wald	df	Sig.	Exp (B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
No	Intercept	.347	.231	2.251	1	.134			
	Circulation prior to first-mover adoption	-2.364E-05	.000	20.859	1	.000	1.000	1.000	1.000
	Small MSA	1.127	.315	12.800	1	.000	3.086	1.665	5.722

*B is the coefficient for the variable.

The coefficient for circulation must be examined to determine the direction of the significance. The coefficient for circulation in order to obtain a nonfirst-mover status for a firm is negative, indicating the larger the circulation, the less likely the firm is to adopt e-commerce. These results strongly confirm Hypothesis 1 while showing no support for Hypothesis 2. When the test was run again using advertising rates instead of circulation, the results were approximately the same with advertising rates being strongly significant ($p<0.001$). These results are shown in Table 2.

Table-2
RESULTS FROM THE SECOND LOGISTIC REGRESSION TEST

Parameter Estimates

First Mover		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
No	Intercept	1.343	1.091	1.517	1	.218			
	Age	-3.066E-03	.004	.530	1	.467	.997	.989	1.005
	Ad rate prior to firm adoption	-3.076E-02	.007	18.841	1	.000	.970	.956	.983
	Small MSA	1.053	.318	10.985	1	.001	2.867	1.538	5.345
	Type of ownership	2.043E-02	.354	.003	1	.954	1.021	.510	2.043
	Northeast	-.495	.491	1.016	1	.313	.609	.233	1.596
	South	-.189	.497	.145	1	.703	.828	.313	2.191
	Midwest	-4.426E-02	.454	.010	1	.922	.957	.393	2.330

*B is the coefficient for the variable.

DISCUSSION

This paper has brought together relevant research into first-movership, e-commerce, and the newspaper industry to develop hypotheses that extend the theory in all three of these areas. The hypotheses generated sought to extend management theory to fill gaps that currently are present in first-mover theory, e-commerce theory, and newspaper industry theory.

Prior to this study, first-mover theory had already been developed showing the relationship of the size of a firm to first-mover advantage (Cui & Lui, 2005; Lowe & Atkins, 1994). First-mover theory had also been developed to show the relationship of e-commerce to first-movership (Huang, Makoju, Newell, & Galliers, 2003; Makadok, 1998; Nikolaeva, 2005). However, the relationship of size of a firm with first-movership into an e-commerce arena had not been examined. This paper fills that void in first-mover theory.

Hypotheses 1 was supported very strongly. Circulation is a proxy for the size of a newspaper firm. This indicates that the smaller a firm is in a competitive market, the more likely it is to adopt a new technology such as e-commerce. These findings certainly agree with the studies mentioned in the previous paragraph. This result is supported by the model created by Gomez-Villanueva and Ramirez-Solis (2013). The model states that a firm's dynamic capabilities can assist in creating a first-mover advantage. The smaller the newspaper firm, the more easily it can change its technology orientation.

Hypotheses 2 related age of a firm and first-mover advantage. Since this hypothesis was not supported, the conclusion is that there probably is not a link between age and first-mover status.

In the logistic regression analysis for Hypotheses 1, one control variable showed up as significant. This was the variable Small statistical area, coded 1 for a micropolitan statistical area and coded 0 for another type. With regards to Hypothesis 1, the data shows that the size of a competitive market, as defined by the U.S. Census Bureau, may be a predictor of first-movership. Firms in smaller statistical areas seem to be more likely to adopt e-commerce than firms in larger statistical areas. If this is the case, then another predictor of first-movership may have been found. While this finding is beyond the scope of this study, the result could lead insight into the dynamics of the industry.

Limitations to the Study

The limitations to this study are several. First, the findings of this study cannot be extended automatically to other industries than the newspaper industry. The data was gleaned solely from newspaper firms and the conclusions were derived for newspaper firms. Additional study needs to be done in order to generalize these results to other industries. In addition only data from 1994-2006 was examined; it was during this time period a major technological change occurred.

The second limitation is the conclusions are based on an analysis of small statistical areas versus regular statistical areas. The large cities had very little representation in the sample and the conclusions might have differed had large cities been a larger part of the sample. Thus, the results found may only apply to a portion of the newspapers industry instead of the whole.

Direction for Future Research

This study showed that circulation is a predictor of first-movership. It also showed that age of the firm is not a predictor. One area for future research is to look at measurements derived from resources and capabilities to see if those had an impact on first-movership as suggested in other research (Suarez & Lanzolla, 2007; Magnusson, Westjohn, Stanford, & Gordon, 2012). Gomez-Villanueva and Ramirez-Solis (2013) indicate in their model there may be multiple determinants based upon the dynamic capabilities of the firm. Such capabilities that might create predictors are leadership types such as strategic leadership or transformational leadership or possibly corporate culture types such as an adhocracy culture or a market culture. Once some of the determinants are discovered, it would be natural then to study the magnitude of the determinants.

While age was not a predictor in this study, it was a predictor in the study of the online book retailers of Weinstein and Standifird (2010). This latter study showed that experience in the book trade was a hindrance to first-mover advantage; newer, less experienced retailers had more open minds regarding how to use the Internet. All of the newspaper firms in the current study were well-established firms that may have been hampered by the same type of thinking. New thinking is indicative of a dynamic capability of the firm that promotes first-mover advantage as indicated by Gomez-Villanueva and Ramirez-Solis (2013). Thus, one area for future research is to look at the entrance of solely online news organizations as later entrants to see what affect they had upon the existing online newspaper presence.

In the analysis of Hypotheses 1 and 2, it was found that the small statistical area variable was significant. Research could be done explaining why firms in a statistical area with few people would be more likely to adopt e-commerce than an area with many people. Of course, this variable may be masking another reason such as the difference in competition between the two types of statistical areas. In either case, research into this area could provide significant insight into the newspaper industry, e-commerce theory, and first-movership theory.

Research also could be performed to see if there are any first-mover advantages. This study showed that the one hypothesized was not an advantage. However, this does not mean there are no advantages as suggested by continuing research into first-mover advantages (e.g. Mueller, Titus, Covin, & Slevin, 2009; Weinstein & Standifird, 2010; Goparaju, 2015). Advantages may occur deeper in the organization such as in production costs or labor costs. This study also showed there may be a first-mover disadvantage with respect to advertising revenue. Future research could look at finding more disadvantages as well as the magnitude of such disadvantages.

Another area for future research is to collect data from news firms in emerging countries and corroborate the findings from U.S. firms. Magnusson et al. (2012) examined environmental conditions related to first-mover advantages in emerging markets. More specifically, Goparaju (2015) collected limited amounts of data from e-commerce companies in India to ascertain if first-mover advantages exist in the same way. The same could be done for news firms, not only in India, but in other emerging countries that are starting to utilize the Internet as a means of doing business.

SUMMARY

First-mover theory has been developed in this study to show the relationship of the size of a firm to first-mover advantage (Cui & Lui, 2005; Lowe & Atkins, 1994). First-mover theory has also been developed to show the relationship of e-commerce to first-movership (Huang et al., 2003; Makadok, 1998; Nikolaeva, 2005). However, the relationship of size of a firm with first-movership into an e-commerce arena has not been examined. This paper fills that void in first-mover theory since Hypotheses 1 shows there is evidence for such a relationship.

This paper also extends e-commerce theory. As mentioned previously, some studies have linked first-movership and e-commerce together, but none have linked e-commerce and the newspaper industry together. The newspaper industry has special characteristics such as a product that can be completely digitized and distributed electronically.

Hypotheses 1 was supported, so e-commerce theory has been extended to show that e-commerce adoption will be more likely under certain circumstances than others. The size of a firm plays a part in whether a firm adopts e-commerce. This has been missing from the e-commerce literature and has been filled by this study.

This study fills a huge void in newspaper industry research. Very few studies have been done on the industry at all (Carroll, 1984a, 1984b; Carter, 1984; Gilbert, 2001; Gomez-Mejia et al., 2001; Wishart et al., 1996) in spite of the simplicity of the industry and the availability of data.

Since Hypotheses 1 was supported, newspaper industry theory has been extended to be able to predict which types of firms may be more likely to adopt e-commerce. While this may be an after-the-fact explanation into newspaper using the Internet, e-commerce may radically change in ways where there will be another first-mover opportunity.

This paper has laid the groundwork for the extension of management theory. A complete literature review of first-mover advantage, e-commerce, and the newspaper industry was given. Two hypotheses were then developed out of the literature review that enhances existing knowledge of these three areas.

This study is very unique in that it extends management theory in three different directions. The hypotheses further develop first-movership theory by showing that size of a firm and age of the firm may play a part in determining which firm will be a first-mover. The hypotheses also develop e-commerce theory by demonstrating the existence of a first-mover advantage as well as some clues as to what those advantages may be. Finally, this study examines the newspaper industry which has had very little research performed on it. This paper contributes to the few studies that have examined the mechanics of the newspaper industry.

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