

PhD THESIS DECLARATION

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Questo lungo lavoro richiede molteplici dediche.

*Ai miei genitori,
esempio di laboriosità e amore,
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Abstract

My dissertation is motivated by the challenge of understanding how technological changes affect competitive advantage in today's fast-changing environments. I develop and test theory through three studies, conducted in the Italian newspaper industry. Through a first inductive study (6 newspapers, 1995-2014), I investigate a theoretically new problem, that is the case when a discontinuity destroys the complementary assets of incumbents while sparing their core know-how. I characterize this specific type of change, and then examine its unexpected implications for incumbents and entrants. In a second essay I elaborate and test hypotheses about technological changes and two-sided markets, using panel data regressions (56 newspapers, 2004-2012). The novel finding of this second research is to show that new technologies devalue existing network externalities. More specifically, a change in technology alters the way value is created, reducing the reliance on network size and increasing the importance of favoring better individual transactions. My third essay is a longitudinal single-case study (1 newspaper publisher, 1995-2014) that sheds new light on how incumbents innovate their business models by opening their boundaries to external knowledge. The findings allow to understand how established companies can react to discontinuities that diminish their value creation and capture possibilities.

This work makes important theoretical contributions for literatures on technological changes, dynamic capabilities, platform markets, and business models, and it opens new venues for future research. It also offers several managerial insights for established companies and new entrants. Results are generalizable across various industries, such as music, news and book publishing, TV, radios, e-commerce, telcos, and higher education.

INTRODUCTION

In today's fast-changing and uncertain environment, organizations need to constantly adapt their competences, assets, strategies, and business models to sustain their advantage. A major source of challenge in this environment are technological changes. They can lead to incumbents' failure (e.g., Tushman and Anderson, 1986; Henderson and Clark, 1990), industry shakeouts (e.g., Klepper, 1996; Utterback and Suarez, 1993), and to the advantage of entrants (e.g., Christensen and Bower, 1996).

The importance of understanding technological changes, and how organizations react to them, is testified by the increasing attention of practitioners (e.g., TechCrunch Disrupt events; European Commission's Digital agenda; FCC's reports) and the media (e.g., The Economist's special reports) to the decline and digital transformation of several traditional industries (e.g., healthcare, higher education, TV, music, publishing, transportation). From Schumpeter's (1942)'s characterization of the process of creative destruction, sociologists, economists, organizational theorists, and strategy scholars have adopted different theoretical lenses and methodologies to study the problem of technological discontinuities. Past researches have shown that incumbents are challenged, and risk to fail, when new technologies destroy their core know-how (e.g., Tushman and Anderson, 1986; Kaplan and Henderson, 2005; Taylor and Helfat, 2009). Subsequent studies posed the attention on the importance of complementary assets to buffer incumbents from the destruction of their core know-how (e.g., Mitchell, 1989; Tripsas, 1997; Rothaermel and Hill, 2005). The novelty of my dissertation is to consider destruction at the level of complementary assets, while the core know-how remains preserved.

The empirical context of my studies is the newspaper industry facing the discontinuity of the Internet (e.g., Gilbert, 2005; 2006; O'Reilly and Tushman, 2004). Web technologies have destroyed newspapers' existing complementary assets (printing presses and the physical distribution), preserved their editorial and advertising core know-how, and devalued their business model (a two-sided market based on readers and advertisers' payments). Due to these transformations, this industry was particularly suited to the aim of this dissertation, that is to better characterize the nature of technological changes and to examine their implications. The dissertation is composed of three related essays, and it has required the creation of a rich longitudinal dataset about the Italian newspaper industry and the execution of a large number of in-depth interviews within the field.

In the first essay of my dissertation, I elaborate a conceptualization of a discontinuous change that helps our understanding of mechanism underlying technological transformations. The research allows explaining how competitive advantage between incumbents and entrants change after discontinuous changes. To develop new theory, I relied on 93 semi-structured interviews with six Italian newspaper publishers and selected entrants, and on extensive archival data (period: 1995-2014) and field observations. I believe that this essay makes a valuable contribution to technological change literature by defining a new type of change, one that destroys incumbents' specialized complementary assets rather than their core know-how. The other major finding of the study is the characterization of a dynamic process, triggered by a "complementary asset-destroying discontinuity". Specifically, when a discontinuity substitutes incumbents' specialized complementary assets with generic complementary assets, many more goods can be produced. The new condition of product abundance and the destruction of specialized assets undermine incumbents' ability to create and capture value. At the same time, entrants with orchestrating capabilities gain competitive advantage.

The second essay investigates the consequences of technological changes in the setting of network and multi-sided platform industries. These industries are defined as all those sectors in which the network size (or installed base) of one group of customers generates network effects (often benefits) for an opposite group of customers (e.g., Rochet and Tirole, 2003; Parker and Van Alstyne, 2005). Examples are TV, radios, and newspapers with audiences and advertisers, real estate and card payment services with buyers and sellers, and telecommunications with senders and receivers. For this second essay I collected data about the performance with readers and advertisers of 56 Italian newspapers (period: 2004 -2012), and then used panel data regressions. To clarify the mechanisms behind my hypotheses, I also added 30 personal interviews with publishing companies and advertising agencies. Economists have shown that network effects (or externalities) favor the emergence of new technical standards, increasing with the size of a network and ultimately favoring technology adoption (e.g., Farrell and Saloner, 1985; Katz and Shapiro, 1985). The twist of my study consists in exploring the reverse direction of causality, that is how new technologies affect network externalities (and not how externalities affect technology adoption). The novel finding is that technological changes reduce the relative importance of network size, in favor of more efficient transactions. The result extends the growing debate on what drives value in network and platform industries, beyond the simple size of a network (e.g., Schilling, 2002; Suarez, 2005; Afuah, 2013). I show that new technologies devalue existing externalities, because they reduce the relative importance of large installed bases and increase the relevance of factors such as search, coordination, and measurement of single transactions. All this has also theoretical and practical implications for the performance of incumbent platforms.

In the third and final essay of my dissertation, I study how organizations react to discontinuities. Empirically, I relied on a single-case study approach, using archival company

data (period: 1995-2014) and 45 new interviews with a major Italian publisher. The originality of the paper consists in understanding how companies innovate their business models (e.g., Zott and Amit, 2008) by exploiting external knowledge from users and third parties (e.g., von Hippel, 1986; Chesbrough, 2003). The major finding is the illustration of a process of adaptation through which incumbents that maintain their focus on internal knowledge also open their boundaries to external knowledge to reduce costs and create value. Overall, the essay highlights interesting trade-offs between closed and open business models.

The three essays have the potential to make significant theoretical contributions. Through the first essay I can address a limitation to the advancement of the technological change literature, by showing the importance of studying discontinuities that destroy incumbents' complementary assets rather than their know-how. Focusing on this different locus of destruction, researchers could better explain complex and emerging phenomena that are increasingly common today. For example, the framework allows to study competitive advantage between newspapers and orchestrating entrants like Yahoo News and Google AdSense, the film and TV industries and the 'over the top' players like Netflix, the radio and music sectors and Spotify or Pandora, and the higher education sector and the MOOCs. Moreover, the model derived in the essay offers specific theoretical insights for literatures on competences, entry, alliances, and ecosystems.

The second essay helps to establish a link between two separated streams of research: technological changes and multi-sided platform markets. The contribution, at the intersection of the two literatures, consists in showing that new technologies devalue incumbents' cross-side network externalities. The theoretical and managerial implication of this finding is that incumbent platforms need to reinvent new ways of creating value. The study suggests possible directions, such as the ability to favor more efficient transactions in the new markets. Scholars

could investigate how incumbents develop these new capabilities, to ultimately innovate their business models. Overall, the essay sheds new light on how business models decline and further evolve, thus contributing to the related literature on the topic. The final contribution of the study is its discovery of new mechanisms driving value in platform markets, beyond the sole network size.

The third essay offers new insights on how incumbents react to discontinuous changes. It shows how companies leverage on the external knowledge from users and third parties to innovate their business models. The study contributes to the dynamic capabilities and knowledge-based perspectives, and utilizes the user and open innovation literature to clarify the mechanisms whereby incumbents adapt to changes.

In the future, I will continue to refine and explore the implications of the developed theory. I am planning to do a study that links the nature of technological changes to the type of alliance that incumbents can form. Preliminary evidences of this dissertation suggest that, when the core know-how is preserved, incumbents are more likely to form alliances among themselves rather than with entrants. This would contrast, and complement, the established view developed through the study of the pharmaceutical industry, in which incumbents allied with biotech entrants to access the new biotechnological know-how (e.g., Pisano, 1991; Rothaermel, 2001). A second study I am planning to do is about entry, and how the characteristic of a discontinuity affects the speed and investments through which incumbents enter new markets. A similar research might complement studies by Mitchell (1989) and Tripsas (1997), among the others.

ESSAY 1. Breaking News: A Model of Complementary-Asset-Destroying Discontinuity in the Italian Newspaper Industry¹

Abstract

Established firms struggle to survive competence-destroying discontinuities *unless* they own valuable specialized complementary assets. But what happens in the opposite case, when discontinuities destroy incumbents' complementary assets while sparing their core know-how? We address this important question with an inductive study of the Italian newspaper industry during the Internet revolution (1995–2014). We find that when a discontinuity substitutes incumbents' specialized complementary assets with generic complementary assets, many more goods can be produced. The condition of product abundance undermines incumbents' ability to create value, while the destruction of specialized assets reduces their ability to appropriate value. Entrants develop new sources of advantage based on orchestrating capabilities that satisfy emerging needs. We offer several contributions for the literatures on technological change and dynamic capabilities.

1. Introduction

The literature on technological and organizational change has shown that new technologies can undermine incumbents' advantage and favor new entrants (e.g., Abernathy and Utterback, 1978; Tushman and Anderson, 1986; Henderson and Clark, 1990; Christensen and Bower, 1996). Following Tushman and Anderson (1986), a large body of this research has focused on how discontinuous change can destroy incumbents' competences. The destruction of incumbents' core know-how was found to be a primary source of unsuccessful adaptation

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(e.g., Anderson and Tushman, 1990; Leonard-Barton, 1992; Kaplan and Henderson, 2005; Tripsas and Gavetti, 2000).

Subsequent research, however, has shown that firms can sometimes survive the destruction of their core know-how. This becomes possible when established companies own specialized complementary assets—namely, the assets required to produce and commercialize knowledge and to appropriate its value (Teece, 1986). Mitchell (1989) demonstrated that specialized assets in the form of marketing and relationships with hospitals allowed incumbents in the medical diagnostic imaging industry to enter new subfields after their core knowledge was threatened. Pisano (1991) showed that large pharmaceutical companies survived the destruction wrought by biotech chemistry by forming alliances with new entrants, which needed the incumbents' specialized assets. Tripsas (1997) found that incumbents in the typesetting industry were buffered from competence-destroying changes when their specialized complementary assets retained their value. Rothaermel and Hill (2005) used a longitudinal study of four industries to demonstrate that incumbents' performance can even increase after a competence-destroying discontinuity, but only if the established firms control valuable specialized assets. Taylor and Helfat (2009)'s study of IBM versus NCR also showed that the ability to integrate complementary assets with new core know-how is key to making a successful technological transition. The sum of this research suggests that incumbents' survival and adaptation depends to a significant degree on the complementary assets they possess.

Our paper extends these contributions by characterizing a new type of change, one that destroys incumbents' specialized complementary assets rather than their core know-how. This unique perspective complements the taxonomy of changes advanced in previous research. More importantly, focusing on the nature of the change, hereafter referred to as

‘complementary-assets-destroying discontinuities,’ permits us to shed light on its consequences. We explain why and how incumbents lose competitive advantage and what competences entrants develop to gain it. The research is phenomenon-driven, observing how the rise of generic and readily available digital technologies changed how products and services are manufactured, delivered, and commercialized—activities that traditionally required incumbents’ specialized complementary assets.

The empirical setting is the Italian newspaper industry transitioning through the Internet revolution (1995-2014). The newspaper industry offers an ideal context because the specialized complementary assets owned by newspaper publishers—their printing presses and their systems for physically distributing a printed product—were effectively destroyed by the advent of new, generic, and readily available digital technologies allowing information to be published and distributed online. Meanwhile, the effect on publishers’ core know-how—their editorial and advertising capabilities—was less direct, less rapid, and ultimately less destructive. Methodologically, we relied on multiple case studies with 6 newspapers, 93 interviews with these newspapers and with selected entrants, archival documentations, and observational data.

Our model shows that incumbents and entrants both adopt the new generic and readily available complementary assets. These assets allow more products to be produced and distributed, causing a shift from scarcity to abundance of products in the market. Abundance diminishes incumbents’ opportunity to create value, while the lack of asset-specificity diminishes their opportunity to capture value. Meanwhile, entrants with orchestrating capabilities gain advantage by offering services to effectively and efficiently manage the new abundance of new products.

Our framework extends previous studies in several directions. Similar to Tripsas (1997), Pisano (1991), Rothaermel and Hill (2005), and Taylor and Helfat (2009), we make explicit distinctions between discontinuities among core know-how and complementary assets. However, we consider a situation in which new technologies *destroy incumbents' complementary assets instead of their core know-how*. Changing the locus of destruction, we reveal new mechanisms that cause incumbents to struggle and possibly fail. This different angle also permits to predict the types of entrants gaining advantage, and to illustrate the interdependencies between incumbents and entrants in the post-discontinuity period. Similar to Teece (1986), we use the categories of specialized and generic complementary assets. In a departure from that seminal study, however, we show that replacing specialized assets with generic new assets not only creates problems of value appropriation (as envisioned in Teece, 1986); it also alters the mechanisms for value creation in an industry.

Other relevant contributions for dynamic capabilities (e.g., Helfat et al., 2007), business model innovation (e.g. Zott and Amit, 2008,) and ecosystem studies (e.g., Adner and Kapoor, 2010) are discussed at the end of the paper.

2. Methods

To develop new theory from process data we followed a grounded theory approach (Glaser and Strauss, 1967; Miles and Huberman, 1994). Our visible phenomenon (Pettigrew, 1992)—the transformation of the Italian newspaper industry in response to the Internet (1995–2014)—was analyzed through multiple case studies. Each case was treated as an independent experimental setting (Yin, 1994) and cross-case comparison was constantly applied. The

method, based on replication logic (Eisenhardt, 1989), permits the emergence of more generalizable findings.

2.1 Research context

The newspaper industry has attracted attention from scholars and practitioners because of the dramatic challenges it has faced since the advent of the Internet in the mid-1990s. Following digitalization, incumbent newspapers experienced a severe decline in revenues from offline advertising and reader subscriptions, without achieving a compensating increase in revenues from online ads and online subscriptions (Pew, 2012). The collapse of this traditional business model has since been studied by governments, major institutions (OCDC, European Commission, Federal Trade Commission), and economists (e.g., Gentzkow, 2007).

The adaptation problem newspaper publishers faced has recently attracted interest from strategy scholars, as well. Gilbert (2005) considered six local newspapers in 1990–2001 and found that publishers allocated financial resources to new digital ventures but failed to update routines. In a subsequent single-case study, Gilbert (2006) observed that adaptation required publishers to integrate competing cognitive frames at the corporate level and to separate the offline and online businesses at the structural level. Similarly, O'Reilly and Tushman (2004) showed that the national newspaper *USA Today* implemented a form of structural ambidexterity in dealing simultaneously with print and digital. Seamans and Zhu (2014) examined how U.S. local newspapers responded to Craigslist, the website offering free classified ads, and discovered that publishers reacted by increasing their readers' subscription prices and by differentiating themselves from other newspapers. These studies extend our knowledge about incumbents' reactions, organizational adaptation, and the implementation of ambidextrous capabilities. Our research also contributes to these aspects, but our aim is to primarily advance the understanding of technological changes. We use the newspaper industry

to shed light on a specific (but, we believe, widely generalizable) discontinuity, and to examine its new implications.

We selected the Italian context to be close to the field and observe the phenomenon with genuine depth. While every national market has some specific traits, we found that the Italian newspaper industry closely reflects the more general phenomenon: as revenues from advertisers and readers declined globally, large digital companies like Google and the Huffington Post gained huge advantage.

2.2 Sampling

Our theoretical sampling (Eisenhardt, 1989) of cases started by selecting the two major Italian national newspapers, *NationalGazette* and *NationalCourier* (pseudonyms), which can be seen as representative of the top-tier news publications in any country (e.g., *The New York Times* and *The Washington Post* in the United States). We then included two local newspapers with different sizes and geographic locations (*LocalNorth* and *LocalSouth*) to introduce variance to avoid biases. Finally, we added two of Italy's leading sports newspapers (*SpecializedGazette* and *SpecializedCourier*), since specialized publications can have a different advantage in the face of high technological uncertainty and environmental turbulence (e.g., Carroll, 1985). The pair of newspapers in each segment (national, local, and specialized) includes one early adopter and one later adopter, because observing polar types helps new theory emerge (Eisenhardt, 1989). Table 1 summarizes our cases.

--Include Table 1 about here--

2.3 Data collection

We developed a rich set of accounts from sources in and around the Italian newspaper industry during three years of data collection (September 2011 to July 2014). We relied on three techniques: semi-structured interviews, documentation, and observations.

Semi-structured interviews. We conducted 93 semi-structured interviews, 65 of them with the 6 case studies and 28 with external experts and relevant industry players (see Table A1 in the Appendix). The latter interviews were used to develop a broader understanding of a complex phenomenon and to control for external perspectives that may not have been immediately visible by interviewing newspapers employees alone. We interviewed leading digital technology companies that reshaped the way news and advertising are exchanged today (in the paper: TechCoA, TechCoB, and TechPartner), and which our same newspaper informants considered to be entrants. Other external sources were industry regulators and leaders in the sector's associations (in the paper: FIEG, AGCOM, and Audipress), industry analysts, advertising agencies, professors with expertise in media studies, and digital entrepreneurs. However, the bulk of the data came from the six case studies.

Within each newspaper, informants were chosen by following a purposeful sampling technique (Lincoln and Guba, 1985). We talked to presidents, CEOs, and executive editors, since these were the parties in charge of strategic decisions (e.g., Isabella, 1990). Adopting a snowball technique, we then extended our interviews at all hierarchical levels, on both the managerial and editorial side of publishing companies. Given our interest in understanding how discontinuities impact traditional value chains, informants were chosen from different organizational functions (e.g., production, distribution, newsroom, advertising). We stopped our interview process when we reached theoretical saturation (Strauss and Corbin, 1990). Each face-to-face interview lasted from one to two hours, and each was recorded and transcribed. We developed an interview protocol (Glaser and Strauss, 1967) that became more structured as collection and analysis progressed (see Table A2 in the Appendix).

Documentation. We consulted archival documentation about the history of the industry and its ongoing transformation: from books and specialty publications to reports by leading

domestic and international institutions (see Table A2). We also consulted public and private documentation before and after most interviews, including annual reports, internal notes, company websites, and blogs.

Observation. Because the sector's evolution has been publicly debated by prominent speakers, we attended major industry events in Italy and in the United States as observers (Table A2). We also participated in internal meetings in which the selected newspapers discussed strategic issues.

2.4 Data analysis

We started analyzing data while collecting them. This iterative approach was consistent with naturalistic inquiry techniques (Lincoln and Guba, 1985) and with our need to constantly compare the emerging themes (Glaser and Strauss, 1967). We employed rigorous methods to transform initial evidence into final theoretical constructs and relationships (Miles and Huberman, 1994). First, we constructed the case studies. For each newspaper we examined the interviews and all additional documentation. Conceptual coding was used to identify first-order (Van Maanen, 1979) or in-vivo (Strauss and Corbin, 1990) themes from informants' language addressing how each publisher approached the Internet, and how technological change impacted its competences and competitive advantage. Second, we employed axial coding to identify linkages and relationships among the first-order themes, thus favoring the emergence of second-order themes. These higher-level concepts were expressed in the researchers' language, and required us to consult frequently with the current literature to assess the lack (or not) of plausible existing explanations (Gioia, Corley, and Hamilton, 2013). Third, we engaged in cross-case comparisons (Eisenhardt, 1989) to identify common traits and differences. This allowed us to create aggregate dimensions that became the building blocks of our model. Interestingly, despite there being variation across cases in terms of performance,

positioning, and actions, case data were highly convergent on the characteristics of the examined change and subsequent process. Finally, to derive a more complete model of technical change, we matched our case studies with the perspective of new technological entrants. Therefore, we coded and analyzed our interviews with entrants and experts, and also examined how our newspapers talked about these entrants. Figure 1 presents the first-order and second-order themes and the aggregated dimensions. Table 2 offers an overview of our themes and representative data.

--Include Figure 1 about here----Include Table 2 about here--

Trustworthiness. Following Lincoln and Guba (1985), we undertook several efforts to guarantee the best credibility, dependability, transferability, and confirmability of our data (see Table A2).

3. Complementary Assets-Destroying Discontinuity

This section presents the first finding of our research: the identification of a specific type of technological change. To illustrate this change we examine the complementary assets and core know-how of the selected industry in the pre- and post-discontinuity periods.

3.1 Core know-how and complementary assets before discontinuity

The newspaper industry is structured as a two-sided market, in which publishers serve two sets of customers: readers and advertisers (e.g., Rochet and Tirole, 2003). To satisfy each set, newspaper companies have two major core competences: editorial and advertising capabilities. The editorial know-how of a newsroom drives competition and differentiation among newspapers, in terms of appealing content for audiences, and represents a core competence for publishers. In line with the definition by Prahalad and Hamel (1990), the

editorial competence is “core” for publishers because it is valuable (to readers), difficult to imitate (being embedded in journalists), and extendible to other products (traditionally to periodicals, television, and radio).² Its building blocks are the abilities to access and evaluate relevant sources, check and analyze facts, filter and create hierarchies of content, and compose journalistic pieces of public interest. In the words of the marketing director of *SpecializedGazette* : “In the past, but even more today, it is the quality of our journalists that attracts readers, and this then in turn creates engaged communities around our brands.”

Since the main output of journalistic activity is content, publishers need complementary assets to package and sell that knowledge to customers. As noted by Teece (1986), innovations generate appropriable profits only if they are successfully delivered and commercialized using specialized complementary assets. In newspapers, these assets have been printing presses and systems for physical distribution. The circulation manager and head of operations of MediaCo explained it this way: “In the economy of knowledge, the manufacturing and distribution assets play a key role. Newspapers controlling the entire chain had a time advantage and a better positioning in the kiosks.” The same MediaCo manager pointed out that publishers who owned presses and managed distribution efficiently could close their newspapers later at night, giving their journalists extra time to obtain the freshest news. If a newspaper scooped a competitor, it could appropriate the value of that scoop for an entire day, as the manufacturing and distribution structure did not allow competitors to reprint information until the following day. The high costs of printing and the tight relationship with distributors also created high barriers to entry.

² We use the terms “core know-how” and “core competence” interchangeably, referring to what previous scholars in the literature on discontinuous change have called “relevant competences” (Tushman and Anderson, 1986), “technological competences” (Tripsas, 1997), and “core technological know-how” (Teece, 1986).

The second area of core know-how for newspaper publishers is their longstanding expertise in serving advertisers, their second group of clients. This competence is so crucial for success that publishers traditionally developed their own internal structures, called advertising sales houses, to sell ad space through trained advertising sales agents. The building blocks of this second competence are a knowledge of advertisers' needs, an ability to design advertising campaigns, close relationships with media and creative agencies, an ability to support brands and increase their value through proper content, and an ability to negotiate, contract for, and extract ad revenues. Publishers' advertising capabilities also match the key characteristics of a core competence, in that they are valuable (to advertisers), difficult to imitate (due to the required experience and relational components), and extendible to other products (e.g., radio, TV, websites, apps). The CEO of LocalSouthCo, owner of *LocalSouth*, remarked on this point: "When we bought out our two local newspapers back in 1997, they were managed without a proprietary sales house and, indeed, they were in terrible financial condition. To create distinctive value and trustworthy relationships with our local advertisers, we developed competences and built our own ad sales house."

The complementary assets that support the advertising core know-how are, again, presses and systems for physical distribution. An executive responsible for the production plants at NationalGazetteCo, owner of *NationalGazette*, explained: "In 2002, our R&D department developed a technology to print ads in full color, and by 2004 our press manufacturer shipped us the new paper machineries. Since our competitors were still offering black-and-white ads, we could charge higher prices for our ads." The distribution system also guaranteed rent appropriation. An executive responsible for *NationalGazette*'s physical distribution said: "If you are able to accurately forecast and distribute the right number of copies to each of the 35,000 Italian newsstands, you avoid missing selling opportunities for your advertisers." The

examined complementary assets were “specialized” because they exhibited a “unilateral dependence” between the core know-how and the complementary asset itself (Teece, 1986: 290). For example, each publisher commissioned expensive, customized rotary presses to meet specific technical requirements. The specialized nature of these assets also explains why they were owned by incumbent publishers.

3.2 Destruction of complementary assets and preservation of core know how

We found that the Internet discontinuity destroyed the specialized complementary assets of publishers. The executive responsible for NationalGazetteCo’s production plants expressed his concern: “The larger newspapers will keep losing hardcopies until they reach a certain threshold. The smaller ones have already started printing in our plants, dismantling their presses.” From a technological and economic standpoint, it is not difficult to understand why digital technologies are substituting for the use of print. Digital tools to produce and publish content are simple to use, radically more efficient, more flexible, and relatively inexpensive. The same holds for the distribution assets. The executive responsible for *NationalGazette*’s physical diffusion said: “Newsstands have not adapted to the changing demand, and they no longer represent a reference point for readers.” Although some of our selected cases tried to innovate their traditional production and distribution processes, the magnitude of technological change represented a real discontinuity in terms of a jump in the price/performance ratio (Tushman and Anderson, 1986). The Internet has eliminated the need to own or manage a complex and expensive distribution system made of warehouses, trucks, and relationships with newsstands, retailers, and the postal service. Moreover, it has allowed bi-directionality and real-time distribution, almost for free. The CEO of LocalSouthCo summed up the situation well: “The entire traditional value chain is in dire straits. Paper mills and printing presses are closing down, and the distribution and newsstand system aren’t

holding up.” As a confirmation of the obsolescence of these assets and skills, we found that the number of non-journalist newspaper employees in the country plummeted from 10,197 to 5,087 from 1995 to 2012, a 100.5% lay-off rate (FIEG, 2012). In conclusion, we found that the web destroyed publishers’ manufacturing and distribution assets (see Figure 1 for this second-order theme). Here we use the term “destruction” consistently with Tushman and Anderson (1986)’s definition, according to which a discontinuity is destroying when “the skills and knowledge base... shift” (1986: 442).

Following again Tushman and Anderson (1986: 442), we assume that a discontinuity is competence-enhancing if it does not “render obsolete skills,” but rather allows incumbents to “build on existing know-how” to adapt. This was precisely what our informants reported regarding their core know-how. As the managing director of online content for *NationalGazette* explained: “If our website is the leader in online news it is because it was founded by people coming from our traditional newsroom, who transferred skills and expertise that are still invaluable on the web.” The “transitioning” aspect of moving an existing know-how from an old technology to a new technology is key in the literature referring to enhancing changes. We found that traditional journalistic rules, expertise, deontology, and social function remained highly valued to produce excellent online journalism. The traditional definition of enhancement also incorporates the element of “incremental improvements” to existing skills. Tushman and Anderson (1986: 441) explained how “incremental technological improvements enhance and extend” while Anderson and Tushman (1990: 609) referred to the retention period as “marked by incremental technical changes and increased interdependence and enhanced competence.” The senior editor of *LocalNorth* remarked: “By working online, our traditional journalists become, day after day, web users, by participating in all social networks and exchanging breaking news on Twitter.”

Similarly, the president of NationalGazetteCo said: “Today journalists from the print edition ask to write for the news website. Why? Because they can do even better journalism online by reaching a global audience in real-time, interacting with readers, and using videos.” In other terms, the change was incremental with respect to the core editorial know-how, as it permitted journalists to gradually add and develop new skills in the years following the discontinuous punctuation of the complementary assets. The adaptation of newspapers’ editorial core capabilities to the online environment reinforced their original competences and knowledge base, rather than making them obsolete.

This second-order theme about the preservation of core know-how (see Figure 1) was also largely supported by triangulations with our documentary data and observations. First, the editorial expertise was not only preserved, it was (and remains) highly sought after online. The major digital entrants in Italy hired top journalists such as Lucia Annunziata (hired by Huffington Post Italy in 2012) and Antonello Piroso (hired by the Italian blog aggregator Populis). Second, as industry research shows, journalists were early adopters of web technologies. For instance, they are among the most followed individuals on Twitter and regularly use the tool to enhance their sourcing. Third, Nielsen data reveals that newspapers have increased their online audiences steadily since 2000, and today they typically rank in the highest positions in terms of audience (e.g., *la Repubblica* and *Corriere della Sera* in Italy and *The New York Times* and *USAToday* in the United States), ahead of the majority of online-native news outlets. These three additional sets of evidence reinforce our finding that the core know-how of incumbents can remain valuable after a discontinuous change.

We uncovered analogous findings about the core know-how of serving advertisers. Publishers’ negotiating ability and their knowledge about advertising clients has remained crucial—or even increased in importance—and it has benefitted from the addition of digital

tools. As the former vice-president of MediaCo's digital division explained: "The sales houses are evolving and adding new services, but essentially on the basis of their profound knowledge of clients' needs. They are also becoming consulting and communication agencies for advertisers." Added LocalSouthCo's CEO: "One of the reasons why local sales houses are preserving their competitiveness is because the local advertisers also receive consulting services from our sales agents. This is a value-added service that pure digital companies cannot easily offer." An extension of this observation was offered by the CEO of the ad sales house of *NationalCourier*: "Our traditional ad sales force provides us with several leverages to successfully play on the web: one is commercial, the other is relational, and finally the ability to negotiate fees. These competences are essential online to sustain a premium positioning and avoid commoditization." Other interviewees offered examples of how the knowledge base and possibilities of sales agents actually increased with the Internet. For example, as the director of planning, production, and customer operations for *NationalCourier* shared: "By using a software of Customer Relationship Management on their tablets, our agents and communication experts now know everything about their clients and current strategies. Moreover, they can now guarantee the better measurement and targeting typical of digital offers, other than new formats like video ads. This has empowered our sales house."

Triangulating our documentary data also confirmed that advertising core know-how was preserved. For example, many technology companies hired their top managers from traditional ad sales houses. In 2012, Google Italy hired as its Country Manager the former CEO of the ad sales house of *NationalGazetteCo*. Second, the two largest digital entrants in Italy, Banzai and Populis, told us that they also formed ad sales teams because algorithmic sales alone was not sufficient. The fact that digital companies needed to develop or acquire the competences of ad

sales houses suggests that this second form of incumbents' core know-how is far from obsolete.

Overall, we found that a discontinuity can destroy incumbents' complementary assets while preserving their core know-how. This integrates existing studies about discontinuities destroying core know-how (e.g., Tushman and Anderson, 1986), destroying core know-how and complementary assets (Tushman and Anderson, 1986; Rothaermel and Hill, 2005), and destroying core know-how without devaluing complementary assets (e.g., Tripsas, 1997, Mitchell, 1989; Rothaermel and Hill, 2005). We formalize this first finding with the following observation:

***Observation:** A discontinuity can destroy or preserve incumbents' core know-how and/or complementary assets. Among the four potential outcomes, one possibility that has been generally overlooked is a discontinuity that destroys incumbents' complementary assets but preserves their core know-how.*

From specialized to generic complementary assets. Our results also suggest that the destruction of complementary assets can occur by substituting specialized assets with generic assets. As already discussed, newspapers' printing presses and distribution systems were specialized assets, and were typically tightly held by publishers. Innovations to these assets required a unilateral collaboration between the manufacturer of the assets (e.g., Cerutti Group) and the publisher. Instead, digital production and distribution assets were, and continue to be, generic and widely available to all. Examples include the various digital content management systems (CMSs) such as WordPress and Blogger, RSS and hyperlink technologies, Twitter and Facebook, and mobile devices like smartphones and tablets. These assets were not exclusively suited to or conceived for producing news content; rather, they were made for different and more general purposes. As such, consistent with theorizing by Teece (1986: 290), these new technologies represented generic complementary assets: "general purpose

assets which do not need to be tailored to the innovation in question” or, in the cases we study here, to the content being created.

4. Consequences of the Discontinuity

We now present our second finding: a model of the change triggered by the identified discontinuity. The model is characterized by two major phases: (1) the rise of product abundance after incumbents and entrants adopt the new assets; (2) the loss of competitive advantage for incumbents and the growing opportunities for specific entrants with new competences (see Figure 2).

--Insert Figure 2 about here--

4.1 Entrants adopt new complementary assets

For more than four centuries, printing presses and a physical distribution system for printed materials were only accessible for a few large companies. Even when radio and TV were introduced in the 1920s and 1950s, respectively, control and ownership of production and distribution technologies did not change substantially (Jackaway, 1995) because broadcasting technologies were still highly specialized and affordable to only a few large companies. On the contrary, today’s digital content management systems, hyperlink technologies, PC and mobile devices, and social networking tools are very generic and widely available. Any organization (news- and/or non-news-centered; small or large), any expert, or any citizen can easily adopt these assets and start producing and distributing content. At *SpecializedCourier*, the vice managing editor said: “For a leading sports newspaper like us it was a surprise to discover that we now compete with the same football teams we covered! The ‘Roma team’ and its captain ‘Francesco Totti’ have websites that directly offer videos of their soccer trainings and other information.” This comment reveals that organizations or individuals that

once needed a media to communicate to customers can now become sources of content in their own right. Similarly, a journalist who manages the digital division of NationalGazetteCo commented: “Ferrari today can talk to its Formula 1 fans and customers using its digital channels. Likewise, if the mayor of Milan wants to talk to citizens, he can do it through the city’s official website. Obviously there is still huge value in being interviewed by a respected national newspaper, which offers a selected audience and employs professional journalists and an authoritative brand. But we cannot neglect the pervasiveness of content produced by all of these sources.” Added the editor of the *SpecializedGazette* website: “All you need to put out content is your PC or a smartphone. The background noise that people can generate is literally infinite!”

All of our six cases provided converging evidence that the new complementary assets were quickly adopted by every possible entrant, from bloggers and citizens to organizations and institutions. This was possible because the new tools to publish and distribute information on the Internet were (and continue to be) generic, inexpensive, and readily available. As the *LocalNorth* assistant editor pointed out: “With such a large availability of digital tools, it is not clear anymore where to put the boundaries of our editorial activity. Citizens and other experts are both receivers and producers of information.” For a more complete view of these developments we also interviewed external informants. For example, the cofounder of the Italian video citizen journalism platform, *YouReporter*, said: “The explosion of news websites by bloggers or ex-journalists in Italy was permitted by WordPress, a generic software that you typically get for free. Similarly, *YouReporter* is a platform that allows people to post videos. Some of them, on earth quakes or other important facts, have been selected by the BBC and Reuters for their programs!” In summary, when a discontinuity substitutes specialized complementary assets with complementary assets that are generic and more readily available,

the new assets may be easily adopted by any entrant: ex-professionals as well as citizens, organizations, and institutions.

***Proposition 1.** A discontinuity that destroys specialized complementary assets by substituting them with generic ones favors the adoption of those new assets by any entrant.*

4.2 Incumbents adopt the new complementary assets

Incumbents also adopted the new complementary assets. This seems counterintuitive because, unlike the new entrants, incumbents could anticipate the potential destruction of their specialized and expensive assets. The literature would suggest that incumbents should be concerned about this sort of asset cannibalization (e.g., Lieberman and Montgomery, 1988; Anderson and Tushman, 1990; Chandy and Tellis, 1998). Instead, our evidence runs opposite to this prediction. Between 1997 and 2001, five of our six newspapers developed an online newsroom dedicated exclusively to their website, which had been technically launched even earlier, between 1995 and 1998 (Table 1). Moreover, they did so while simultaneously maintaining the use of their traditional complementary assets. The director of the digital division of NationalGazetteCo explained: “Our earliest experiment with the Internet was in 1996, when we were the first to use the web to provide real-time results of Italian political elections. The unexpected audience success convinced the publisher to allocate money and 10 journalists already in 1997, when we launched our news website.” At *SpecializedGazette* the editor-in-chief of the website told us something similar: “A group of our journalists understood back in 1997 that our website was an incredible tool to engage with readers and constantly give them updates and sports pictures.” We also found variance among cases, with a few newspapers initially more resistant to change. It is also interesting to note that in the years in which our incumbents adopted the first web technologies, the rest of the country was poorly reached by the Internet, suggesting that firms’ adoption anticipated customers’ demand.

According to the World Bank, broadband Internet penetration in Italy was 2% in 1998 and only 11% in 2005. Furthermore, newspaper companies launched comparatively more online activities than many important industries. By comparing the stock market price of MediaCo and NationalGazetteCo against the average stock price of other industries (automotive, apparel, chemical, manufacturing, etc.), we discovered that the two publishing companies registered the largest price appreciation in the period after the dot.com bubble (Source: Bloomberg). Overall, incumbents rapidly adopted the new complementary assets, including investments in human and financial resources.

But why did incumbents adopt new generic assets when these assets could destroy their specialized assets? We found that technological advancements at the complementary-assets level can offer better opportunities to deploy the core know-how. The managing editor of *NationalGazette's* website said: "For the first time in history the web has allowed us to reach audiences worldwide and in real-time. And the process of gathering and fact-checking news has also become more effective and efficient." We collected similar evidence demonstrating that newsrooms felt empowered by digital technologies. The vice managing editor of *SpecializedCourier* stated: "Our daily activity has been strengthened by the use of higher performing web tools. Thanks to them we can have a homepage offering interactive infographics and videos, and news coming to us from all sources." An editorialist from *NationalCourier* told us: "I would never go back to the solely print period, and neither would my colleagues. Despite our revenue problems, journalism is now living its Golden Age." Managers also mentioned the more productive utilization of content, along with the editorial and advertising skills, now deployed and distributed on different platforms. The general manager of the digital division of NationalGazetteCo explained: "We use a clear multimedia strategy. Our content has a different life in print, on the web, and on mobile devices, and our

sales agents now sell a stronger bundle of print and digital.” It is also useful to observe that, from 1995 to 2005, the cannibalization of the offline assets was not very tangible, to the extent that most of the publishers acquired new presses still in 2004–2006. This suggests that a cannibalization may be weak initially, and incumbents can think of the new assets as additional channels to produce and redistribute their products.

In conclusion, when a discontinuity destroys specialized complementary assets by replacing them with more generic ones, incumbents adopt the new technology. The reason is that a discontinuous advancement at the asset level offers better ways to deploy the (preserved) core know-how, guaranteeing, for example, a better manufacturing and distribution system. Moreover, incumbents can see in the new assets an additional channel to reach more customers. More formally:

***Proposition 2.** When a discontinuity destroys incumbents’ specialized complementary assets by substituting them with generic ones, and preserves the incumbents’ core know-how, incumbents will adopt the new assets.*

4.3 From a scarcity to an abundance of products

We identified mechanisms through which the combined activity of incumbents and entrants causes a shift from a scarcity of products to an abundance of products. First, a discontinuous change at the level of complementary assets can allow incumbents to more fully deploy their core know-how. As already illustrated, new technologies permitted newspapers to more rapidly write and disseminate newsworthy articles and comments. Rather than creating and delivering content only once per day, as was the case with printed products, our incumbents became able to provide news and updates in real-time, on several platforms, using different formats of communication. The managing editor of *NationalGazette*’s website stated that they now produce 24 hours a day because their “online newsroom can serve readers living abroad in diverse time zones.” This is because a discontinuity that impacts the production and

distribution assets can generate a significant improvement in the productivity of those assets, thus permitting a better utilization of the core know-how of other parts of the organization. The vice managing editor of *SpecializedCourier* concluded: “Digital technologies have made the job of reporters frictionless compared to when they needed to go down in the typography or wait to be sure that all articles were perfect before imprinting the metal plates of presses. Moreover, they now write more, for the sake of having more audiences following them.”

Second, a discontinuity that substitutes specialized assets with generic assets reduces the barriers to entry, thereby contributing to the potential for product abundance. The director of digital content and product development for *NationalGazetteCo* explicitly affirmed: “We moved from an era of scarcity [print] to an era of abundance [online]. With the diffusion of all these digital tools there are no longer barriers to entry and everybody can express his voice.” The same evidence came from our interviews with external firms. The presidents of the two large Italian entrants, Populis and Banzai, both said that they enable hundreds of thousands of contributors and blogs every day. Archival sources like the OECD (2007)’s report also capture the massive dimension of today’s user-generated content (“UGC”) (see Table A3). Entry into online content production was not limited to users, citizens, bloggers, and ex-journalists, either; it also involved non-news organizations and private companies. The chief digital officer of *LocalNorthCo* said: “Red Bull in Italy hired the best F1 journalist from traditional media, Giorgio Teruzzi, to fill its official website with content related to the brand and the sport. This is not journalism but it is something at the intersection with advertising: branded content. However, it shows us how firms can now publish their content.”

Third, the mobility of individuals from incumbents to entrants allows some entrants to produce content. Entrants that adopt the new complementary assets may then hire selected individuals with the required core know-how. Respected journalists were hired by entrants

such as Huffington Post, Populis, and Yahoo!News, or by non-news companies like Redbull and the Roma football team.

Fourth, a technological substitution of specialized assets with more generic and readily available ones fosters imitation, re-production, and re-distribution. By obtaining the necessary complementary assets, any entrant can quickly copy, expand upon, or comment on newspapers' content. The destruction of specialized assets facilitates imitation (e.g., Teece, 1986), and the availability of generic new assets enables knowledge recombination (e.g., Kogut and Zander, 1992). Offering evidence about the role of imitation, the director of the digital division of MediaCo said: "In 2006 we found out that a 16-year-old was systematically copying and posting online the column of one of our best satirical journalist, each Saturday at 7:00 am!" An example of knowledge recombination was mentioned by a manager of the digital division of NationalGazetteCo: "In 2005 in Italy a guy was killed by police and this important fact became known since the mother's guy denounced the tragic event through her blog on our newspapers' website, posting photos and comments. Mainstream media used her original published materials to start interpreting and analyzing this crime news."

Overall, the examined discontinuity leads to product abundance due to simultaneous production by incumbents and entrants, through the identified mechanisms. We offer the following:

Proposition 3. *When a technological discontinuity introduces new complementary assets that are adopted by both entrants and incumbents, a shift occurs from a scarcity of products to an abundance of products.*

4.4 Problems of value creation and capture for incumbents

The abundance of products undermines incumbents' ability to create economic value. In the news industry, the huge availability of content online in most cases wiped out readers' incentive to pay. While our informants said that the Internet empowered what they do with

their know-how, to the point of creating a “renaissance of journalism,” they also admitted that it is more difficult to sell products online. The editor-in-chief of *SpecializedGazette*’s website explained that they initially tried to charge for their online content, in the period 2001–2005, without success. The president of NationalGazetteCo was more explicit: “News has become a commodity. There is nothing that is really news today. To play a role journalists now need to answer the ‘why’ question, since the ‘what’ is already known.” It is interesting to note that, according to surveys, the number of people who read Italian newspapers increased by 4 million in 2001–2012, while the number of offline copies of newspapers sold in 2000–2009 declined by 21% (Audipress, 2012) and circulation volume in 2000–2012 fell by 33% (FIEG, 2002; 2013). This reveals that, while consumers’ interest in professionally produced news articles increased, the abundance of sources created a perception that news is a commodity that can be consumed at no cost to the consumer (see Table A3).

A similar value-creation problem occurred for advertising: the huge availability of online content led to a surge in associated ad spaces. The director of digital content and product development of NationalGazetteCo said: “The continuous increase in advertising spaces leads to a devaluation of the space itself and to a strong pressure on prices.” The vice-managing editor of *SpecializedCourier* added: “Advertisers do not value our online ad spaces as they valued the printed product.”

Newspapers’ business-model concerns are also rooted in issues of value capture. Consistent with Teece (1986), our previous section showed empirically how this industry’s specialized complementary assets were excellent for appropriating the rents required to fund investigative journalism, send war correspondents across the globe, and employ thousands of reporters and ad sales agents. To the contrary, online production and distribution tools are so generic that they are tradable on the market, and thus do not grant any protection or advantage to their

owners. Even if professional newsrooms use assets that are relatively more specialized to their complex daily activities, the rest of potential entrants can easily imitate, reproduce, redistribute, or even introduce new content using their more-generic assets. In summary, the identified discontinuity has a double-negative effect for incumbents: undermining their opportunities to create value *and* to capture value.

Proposition 4. *Product abundance caused by the destruction of incumbents' specialized assets diminishes incumbents' ability to create value and to capture value.*

4.5 Entrants build advantage

We now illustrate how the same discontinuity provides opportunities for specific types of entrants. We present two findings. First, product abundance favors the emergence of specific customer needs. Second, entrants developing orchestrating capabilities can satisfy these needs, gaining advantage.

The former managing editor of *NationalCourier's* website said: "If I put myself in the shoes of a digital reader, what I expect to get from a website is a selection of the 15 best articles available on the web. The web has created a lot of entropy, and it is important to save time and read only what matters." This quote suggests that product abundance can lead to complexity and uncertainty in choices, creating a need for more selection and efficiency. The former managing editor of *NationalGazette's* website said: "Online news organizations that aggregate and link to external content can provide a lot of value to readers." This suggests that aggregation and comparison are important when many possibilities are made available. Given that we examined new entrants, we interviewed several external companies that do not produce content but offer related services, and asked them to talk about the needs they satisfy. A former executive from a globally leading company in the search engine domain (in the paper, TechCoB) told us: "What is important for online readers is searchability. Either you

want to consume news, or books, or scientific publications, the first thing you want is to be able to identify what you are looking for, since it is easy to get lost online.” Another executive from an international technology company offering online retargeting advertising services (in the paper, TechCoA), stated: “Due to the infinite number of digital sources, advertisers face a new problem today: how to efficiently and effectively allocate ad budgets online? Searching customers is potentially more challenging online, whereas offline there were just few news outlets to consider.” Finally, from our documentary sources we also found that industry experts, including the media guru Clay Shirky (2010), expressed very similar judgments: “Abundance breaks more things than scarcity does. Society knows how to react to scarcity.” The underlying argument is that it is more difficult to set priorities and avoid getting sidetracked when information abounds. We conclude that, by inducing product abundance, the examined technological change favors the emergence, or the rise in importance, of specific customers’ needs associated with facilitating transactions (Williamson, 1981; Amit and Zott, 2001). Examples of these needs are search, aggregation, selection, comparison, time saving, and more efficiency and efficacy.

We now discuss the competence through which entrants can gain advantage in a market characterized by product abundance: orchestrating capabilities. Orchestrating capabilities are competences related to the management of products rather than to their production per se. As the former managing editor of *National Courier*’s website said: “Companies like *Yahoo! News* or *The Huffington Post* select and aggregate some of the best content produced by others, either using algorithms or human curation.” The two major Italian entrants, Banzai and Populis, developed respectively a semantic algorithm for content aggregation called *liquida.it*, and a very large network of existing blogs, *blog.it*. The Google search engine is another examples of orchestrating competences, as it allows one to efficiently access the desired

content from among seemingly infinite alternatives. Facebook and Twitter have instead built their aggregation and filtering ability based on the recommendations of users sharing content among friends. Flipboard is another example of news aggregation and selection, in this case for mobile devices. Thanks to its competence in orchestrating content produced by others, *Yahoo! Italy* ranked fourth for online audience in March 2012, ahead of the websites for Italy's two major newspapers, *la Repubblica* and *Corriere della Sera*, which ranked sixth and seventh, respectively (data from Audiweb). Banzai's *liquida.it* and Populis's *blog.it* occupied the sizable positions of eighteenth and thirty-first (Prima Comunicazione, 2012).

The competence of orchestration was found to be important in the advertising business, as well, due to the almost infinite availability of ad spaces online. The executive from TechCoA stated: "To respond to advertisers' problem of targeting the right audience in a cost-effective way, we developed a technology that allows them to retarget each user as it move across websites." The former executive from TechCoB also said: "Any tool we develop is aimed at simplifying the life of our users and corporate clients, given today's challenges of big data." The head of media market analysis at AGCOM also commented: "The algorithms that some technology companies are developing permit advertisers to reduce the dispersions in ad investments typical of the first years of the web, when companies just spread their ad budget around. Now they can search and target their ideal customer."

To better understand these phenomena we next studied the historical evolution of the online display advertising industry. Such an evolution provides an invaluable example to visualize our theoretical model in practice. In the years 1995–2001, each publisher sold its online ad spaces using its own ad sales house. The explosion in the number of Internet websites caused a problem of abundance among online ad spaces. Beginning in 2002, specific technology companies called "ad networks" entered the market by aggregating publishers'

unsold ad spaces and using algorithms to resell them to advertisers. This first wave of orchestration by new entrants was designed to help advertisers cope with the abundance of online ad spaces. However, the exponential growth of websites made it impossible for ad networks to sell the massive aggregation of ad spaces; therefore, they opened the boundaries of the ad networks to new companies specialized in external trading. By 2004, this had led to the rise of “ad exchanges,” and later to real-time bidding technologies that allowed advertisers to bid on specific properties. Finally, still more companies entered to orchestrate abundant ad spaces; these “retargeting networks” touted better efficiency and targeting. Examples include Google AdSense, Microsoft Ad Exchange, CPX Interactive, Facebook FBX, and AdRoll.

Overall, by inducing abundance, the examined discontinuity favored the emergence of customers’ higher-order needs, which could be satisfied by entrants offering orchestrating services. Examples of these entrants were search engines, news aggregators, digital platforms for trading advertising spaces, social networks, and so on, all orchestrators of others’ products. Not all of our six newspapers mentioned this threat, as their most feared competitors were (and are) companies like Google, Yahoo!, Facebook, Microsoft, and AOL. These companies entered “on top of” incumbents’ activity, an approach known as Over-The-Top (OTT). In 2011, these five companies captured 68% of the total digital advertising revenues in the United States (PEW, 2012), while in Italy Google alone captured roughly 60% of the entire market of online advertising in 2013 (AGCOM, 2013).

We examined the strategy literature to see how previous scholars approached the concept of orchestrating capabilities. Teece (2007) refers to orchestration capacities as important elements of dynamic capabilities, whose function consists of semi-continuously assembling and recombining key assets and realigning them to gain competitive advantage. Similarly, Sirmon and Hitt (2009) describe asset orchestration as a form of resource management and as

a central component of dynamic managerial capabilities. Helfat et al. (2007) suggested that asset orchestration requires a fit between the search/selection of resources and their configuration/deployment. These previous definitions are consistent with what we found to be key in an orchestrating capability—that is, the ability to assemble, select, search, and manage resources. We therefore posit the following:

Proposition 5. *Product abundance brings advantage to entrants that possess orchestrating capabilities.*

5. Discussion and Conclusions

Technological changes are critical for understanding how firms lose or gain advantage (e.g., Christensen and Bower, 1996; Henderson and Clark, 1990; Tushman and Anderson, 1986). Prior research has acknowledged that technological discontinuities that destroy incumbents' core know-how tend to cause firm failure (Anderson and Tushman, 1990; Leonard-Barton, 1992). Subsequently, scholars have shown that incumbents can survive competence-destruction if they own valuable specialized complementary assets (e.g., Mitchell, 1989; Tripsas, 1997; Rothaermel, 2001). This has suggested that complementary assets play an important role in transitioning through discontinuities, in addition to allowing the appropriation of innovation rents (Teece, 1986).

However, here we observed that technological changes do not necessarily destroy incumbents' core know-how; their impact can be mainly located at the complementary-asset level. Our study adds to the previous literature by analyzing this different type of change, in which a discontinuity destroys incumbents' specialized complementary assets while preserving their core know-how. This situation was visible in the newspaper industry context we studied—the Internet technologically destroyed newspapers' printing presses and physical

distribution systems (specialized complementary assets), but did not render obsolete their editorial and advertising competences (core know-how). A similar situation has emerged across many other industries, including music, movies, television, radio, books, magazines, and academia. Companies operating in these setting are also facing serious challenges in terms of firm performance and business models. Our study was a first effort to characterize this change and identify its consequences for the advantage of incumbents and entrants.

5.1 Contributions

Our research contributes to the technological change literature (e.g., Christensen and Bower, 1996; Henderson and Clark, 1990; Tushman and Anderson, 1986) by characterizing a type of discontinuity that does not act at the level of core know-how (e.g., Tripsas, 1997; Mitchell, 1989; Rothaermel and Hill, 2005), but rather at the level of complementary assets. This symmetrical configuration of change produces new and unpredicted implications. First, it induces a shift from a scarcity to an abundance of products in the market, because new, generic, and widely available assets enable both incumbents and any potential entrant to produce and distribute additional products. Second, incumbents are handicapped by dwindling opportunities to create and capture value: the abundance of products reduces their ability to charge an adequate price, and the destruction of specialized assets undermines their value appropriation. Third, the condition of abundance creates new and specific customer needs, such as the need for better search, coordination, selection, time saving, efficiency, and efficacy. Entrants that do not produce products, but instead offer services to orchestrate the abundance of products produced by others, are able to satisfy customers' emerging needs and gain competitive advantage over incumbents.

Our insights also extend the strategy literature on resources and competences (e.g., Barney, 1991; Teece, Pisano, and Shuen, 1997). Similar to Helfat et al. (2007), Sirmon and Hitt

(2009), and Teece (2007) we explain how an orchestrating capability may lead to competitive advantage after a technological discontinuity. However, we showed that, after the identified discontinuity, orchestrating competences are *more likely to be developed by entrants* than by incumbents, and we explain why. Entrants' advantage stems from the fact that they do not bear the cost of manufacturing, and that they are free to develop orchestrating services on top of available products. Vice versa, incumbents remain more focused on exploiting their undestroyed core know-how, because it is still essential to produce products that customers demand. Moreover, incumbents also find it difficult to orchestrate others' products because they are themselves producers: each incumbent has its own brands and identity to defend against competitors' products. Future research might explore the mechanisms that govern how these new competences develop, and examine their long-term implications.

Another relevant contribution is to business model studies (e.g., Amit and Zott, 2001; Afuah and Tucci, 2000). This literature stresses the importance of value creation and capture as the two main components of a business model (e.g., Teece, 2007), and suggests a need to further study how they evolve (Zott and Amit, 2008). Our study contributes by linking the technological change and business model literatures, showing that complementary asset-destroying discontinuities undermine incumbents' capacity for value creation and capture.

Our findings also inform research on ecosystems (Adner and Kapoor, 2010; Iansiti and Levien, 2004) by showing how entrants can coexist with incumbents by orchestrating their products. However, counter to entrants' claims that their orchestrating services help incumbents make their product more searchable or accessible, we show that orchestration can disadvantage incumbents. Further study of these competing dynamic could specify the conditions under which incumbents are willing to coexist with orchestrating entrants, and when they will act to break out.

5.2 Limitation, future research, and generalizability

This was a longitudinal and qualitative study at the industry level, and it shares the common limitations of the method. To mitigate the possibility of retrospective bias and single-informant bias, we triangulated multiple sources of data and deeply analyzed the phenomenon from multiple perspectives and over time. For the level of analysis, more micro-level studies could better investigate how technological changes impact customer preferences and needs (e.g., Tripsas, 2008). We could not collect data directly from customers, but only indirectly from newspapers, entrants, and external experts.

One important extension of our model is to examine incumbents' reaction. It would be useful to study what dynamic capabilities (e.g., Helfat and Peteraf, 2003; Teece et al., 1997) are needed to respond to changes that undermine incumbents' value creation and capture. Newspapers today are increasingly cooperating among themselves, forming publishers' consortia, to respond to entrants such as Google or Facebook. The same reaction seems to be common to many other industries, such as higher education, with universities forming consortia (e.g., Coursera and edX) to offer massive online open courses (MOOCs), and in the movie industry, where incumbents formed intra-industry alliances in response to Netflix. Past research about the pharmaceutical industry testified that incumbents ally with entrants to respond to discontinuities that destroy their core know-how (e.g., Mitchell, 1989; Pisano, 1991; Rothaermel, 2001). By contrast, future research might examine why incumbents today often ally among themselves, and we expect that this outcome is more likely for complementary asset-destroying discontinuities. By further studying how incumbents use alliances to respond to changes, it will be possible to also contribute to literature on intra-industry cooperation and consortia (e.g., Browning, Beyer and Shetler, 1995; Dyer and Singh, 1998).

Another fruitful extension of the model would be studying entry and technological changes in conjunction. Mitchell (1989) theorized that incumbents enter new markets if a new technology threatens their core know-how but their complementary assets remain valuable. The newspaper case shows that the opposite may also be true, in the sense that incumbents can invest and enter early when their complementary assets are destroyed and their core know-how is preserved or enhanced. Finally, researchers could also study different forms of complementary-assets destruction. In this paper we focused on Teece (1989)'s categorization and highlighted a substitution of specialized assets with generic assets. However, other categories might also apply, such as the concept of enabling assets and technologies. Moreover, complementary assets different from production and distribution could also be considered; for example, brand and reputation.

In terms of generalizability, we believe our findings apply to many important industries that share common traits with the newspaper sector. The radio, TV, and magazine industries are also structured as a platform serving two groups of customers, audiences and advertisers. The music, movie, book, and education sectors are also knowledge industries, producing information goods. These contexts have also experienced (with different degrees of advancement) a destruction of existing production and distribution facilities alongside an opportunity to leverage core know-how via the Internet. Their products—music, videos, magazines, and academic lectures—have become more abundant online, and therefore cheaper. The entrants gaining advantage are again those with orchestrating services: Spotify for music, Pandora for radio, Netflix for TV, Udacity and Kahn Academy for education. In many of these industries, the core knowledge is still valuable, and companies are looking for ways to exploit and protect it, reestablishing their competitive advantage.

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7. Tables and Figures

Table 1. Data of the six cases

Newspapers	Type	Year of foundation	Size (copies sold in 2011)	Total revenues in 2011	Owning company	Active website ^a (dedicated newsroom)	# of interviews ^b
NationalGazette	National	1976	156.058.286	390.619.867	National GazetteCo	1997	32
NationalCourier	National	1876	169.223.355	308.314.049	MediaCo	2001	15
SpecializedGazette	Specialized	1896	102.634.761	168.634.891	MediaCo	1997	6
SpecializedCourier	Specialized	1924	67.563.917	69.188.047	Specialized CourierCo	2007	3
LocalNorth	Local	1892	13.053.485	20.952.286	LocalNorth Co	2001	6
LocalSouth	Local	1995	4.052.884	5.080.016	LocalSouth Co	2007	3

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^a The year indicates when a newspaper created a dedicated online newsroom actively producing content for its website. The sole opening and launch of the website (often just repurposing a “pdf replica”) began much earlier, between 1995 and 1998 in all cases.

^b The number of interviews with each newspaper was proportional to its circulation and revenues, but it also depended on the evolution of our snowball sampling and theoretical saturation within each case.

Table 2. Additional data supporting the model of Complementary Asset-destroying Discontinuity

2 nd Order Theme	Representative Quotes
<p>Complementary assets destroyed <i>before: specialized</i> <i>after: generic</i></p>	<p>“Printing and distributing newspapers require large physical investments and trained human capital with an industrial engineering background. Also online you have to invest, but much less! Moreover, anyone can learn to use digital tools.” (Director Plant Technologies, NationalGazetteCo)</p> <p>“We needed to closely work with a manufacturer of presses to get new flexographic machineries that responded to our requirements of colored pages and a good tactile perception. (Director Plant Technologies, NationalGazetteCo)</p> <p>“The two major Italian newspapers never distributed their copies sharing the same vans. They have independent diffusion systems, accounting for their specific estimates of sales.” (Circulation Manager, MediaCo)</p> <p>“Publishers have a very peculiar process of measurements and certification of their copies sold. Each newspaper can collect estimates of its daily copies sold with a statistical significance that moves from 12% to 50% in the following second and third day, and that reaches 100% in one week. Then the data can be made officially available to advertisers only after the certification of the Audit Bureau of Circulation [ADS in Italy]. The process of countercheck takes three months. Instead, websites measure their audiences in real-time, and can be certified by simply asking Nielsen, ComScore, or Google to use their standard tools on their webpages.” (Director Diffusion, MediaCo)</p>
<p>Core know-how preserved</p>	<p>“Internet is flux, and speed and capacity matter. We have gradually developed all the necessary additional skills by operating online since 1997, and now we are the first news website in Italy and among the most followed on Facebook in the world. However, in a flux you also need to hold the news that brings meaning! We do this thanks to our traditional vast knowledge accumulated in years of professional experience in the printed business. We have a method, rules, and invaluable columnists that have been correspondents from war zones or politically critical cities for decades. This is why in 2013 Warren Buffet acquired 63 local newspapers and Jeff Bezos acquired the Washington Post. These traditional newspapers are repository of knowledge and value!” (Editor in Chief, NationalGazette)</p> <p>After almost 20 years of digital revolution we can say that the transition has been more successful for those [newspapers] employing their print journalists to the web. What attracts audiences are the video comments and tweets of reputable columnists with gray hairs.” (CEO, LocalSouth)</p> <p>“Our highest rigor in fact-checking and know-how in interpreting and selecting facts make readers turning to us when important events happen!” (Editor-in-chief of the website, NationalGazette)</p> <p>“Today our ad sales house offers online video ads, metrics, and any digitally sponsored communication. Pure digital websites do not have dedicated structures like the one we have; they are forced to accept that Google sells their ad spaces for nothing. To sit at the table with big advertisers you need competences, brands, and historical contacts!” (Director Digital Division, MediaCo)</p>

Tesi di dottorato "Three Essays on Technological Change and Competitive Advantage: Evidence from the Newspaper Industry"
di COZZOLINO ALESSIO

discussa presso Università Commerciale Luigi Bocconi-Milano nell'anno 2015

La tesi è tutelata dalla normativa sul diritto d'autore (Legge 22 aprile 1941, n.633 e successive integrazioni e modifiche).

Sono comunque fatti salvi i diritti dell'università Commerciale Luigi Bocconi di riproduzione per scopi di ricerca e didattici, con citazione della fonte.

Continues

2nd Order Theme	Representative Quotes
Entrants' adoption	<p>“Large industrial groups have bought digital CMSs to provide their direct information to customers. Those companies are hiring ex-journalists to generate a constant flow of news, since they need their competences and credibility. The blend of branded content and traditional news risk to create confusions among readers!” (Chief digital officer of Local NorthCo)</p> <p>“Often breaking news come out first from Twitter than from news agencies like Reuters or Associated Press. This is because anyone has a smartphone and an account to write! Any organization and citizens, among which politicians, tweet.” (Vice Managing Editor, SpecializedCourier)</p> <p>“Several technology companies that developed or adopted digital tools to publish and diffuse information are now increasingly hiring journalists. The mobility of these people, and the reliance on external contributors, allow these companies to actively contribute to information abundance.” (Former Managing Editor of the website, NationalCourier)</p>
Incumbents' adoption	<p>“Through our websites and apps we have extraordinary tools to inform millions of people and have a more direct conversation with them. Moreover, by controlling our digital channels we instantaneously measured our results in terms of data traffic. Then we also need to be on all social networks, because people stay there; through them we spread our content.” (Director Digital Division, National GazetteCo)</p> <p>“Since 1996 we travelled to Boston to learn about the first digital journalistic prototypes developed at the MIT Media Lab. In 1999 we imported and implemented in Italy a platform that we transformed in the largest global installation of citizen journalism for schools!” (Former internet & multimedia strategist, NationalGazette)</p> <p>“Twitter and the other digital tools improve what we do as journalists. Some of my colleagues and myself have the highest number of followers on it! The work of journalist is more fun today, and we like sharing our work and discuss it online.” (Editorialist, NationalCourier)</p> <p>“Readers have always looked for a more direct contact with us, by sending postal letters to the newspaper. When new technologies like the forum became available in the early 1998 we immediately opened to them. We also quickly incorporated the RSS feed technology in our articles to let people get personalized news.” (Journalist and manager digital division, NationalGazette)</p>

Continues

2nd Order Theme	Representative Quotes
Entrants' orchestrating capabilities	<p>“The Silicon Valley giants keep defining themselves as technology companies, but the reality is that they entered in the publishing business and this is how they make majority of their revenues. Google is everywhere, from the search of content [Google search] to the aggregation of them [Google News, YouTube] to the remuneration of publishers' unsold inventories [AdSense]. Facebook, Microsoft and Yahoo! do the same. They have success because it is convenient for users to get aggregated and filtered good content in one place, rather than browsing the entire web.” (President and Owner, National GazetteCo)</p> <p>“Most of the startups in the media business offer curation or aggregation services to users, helping them to personalize or optimize their consumption. With a similar value proposition they easily convince venture capitalists.” (Editor-in-Chief of the website, NationalCourier)</p> <p>“Our app selects for you quality news videos coming from premium publishers. We measure our performance in terms of the time reduction we guarantee to access to good content. While preparing your breakfast you can watch our selection of videos without you having browsed all sites to find them.” (CEO and Founder, Watchup)</p> <p>“We enable the reachability and searchability of data; this is vital for companies sponsoring their products and for users searching for information. Our partnership team is huge, and it works by communicating to companies the importance of being index-linked to increase their visibility and access.” (Manager of Strategic partnership development, TechCoB)</p>
Incumbents lose value creation and capture	<p>“To have a reference point about the prices that we can charge for online ads, just consider that one out of five pages opened daily in the U.S. is a Facebook webpage” (Director of Digital Content and Product Development, NationalGazetteCo)</p> <p>“When observers criticize newspapers for not having charged for their work online they make two mistakes: first, we tried; second; you have to accept the rule of the new medium if you stay on it, and this technology has always allowed to share massive amount of information for free!” (Editor-in-Chief of the website, NationalCourier)</p> <p>“Since Twitter is not owned by publishers, it is problematic for journalists to report their breaking news on a distribution platform where we have no control.” (Editor-in-Chief of the website, SpecializedGazette)</p> <p>“Internet is not only free content but also changes in consumer behavior: chatting, sharing, new modality of consumption like mobile, and so on. The problem of traditional media companies is finding a business model that intercepts the changed needs.” (President, MediaCo)</p>

Figure 1. Data structure

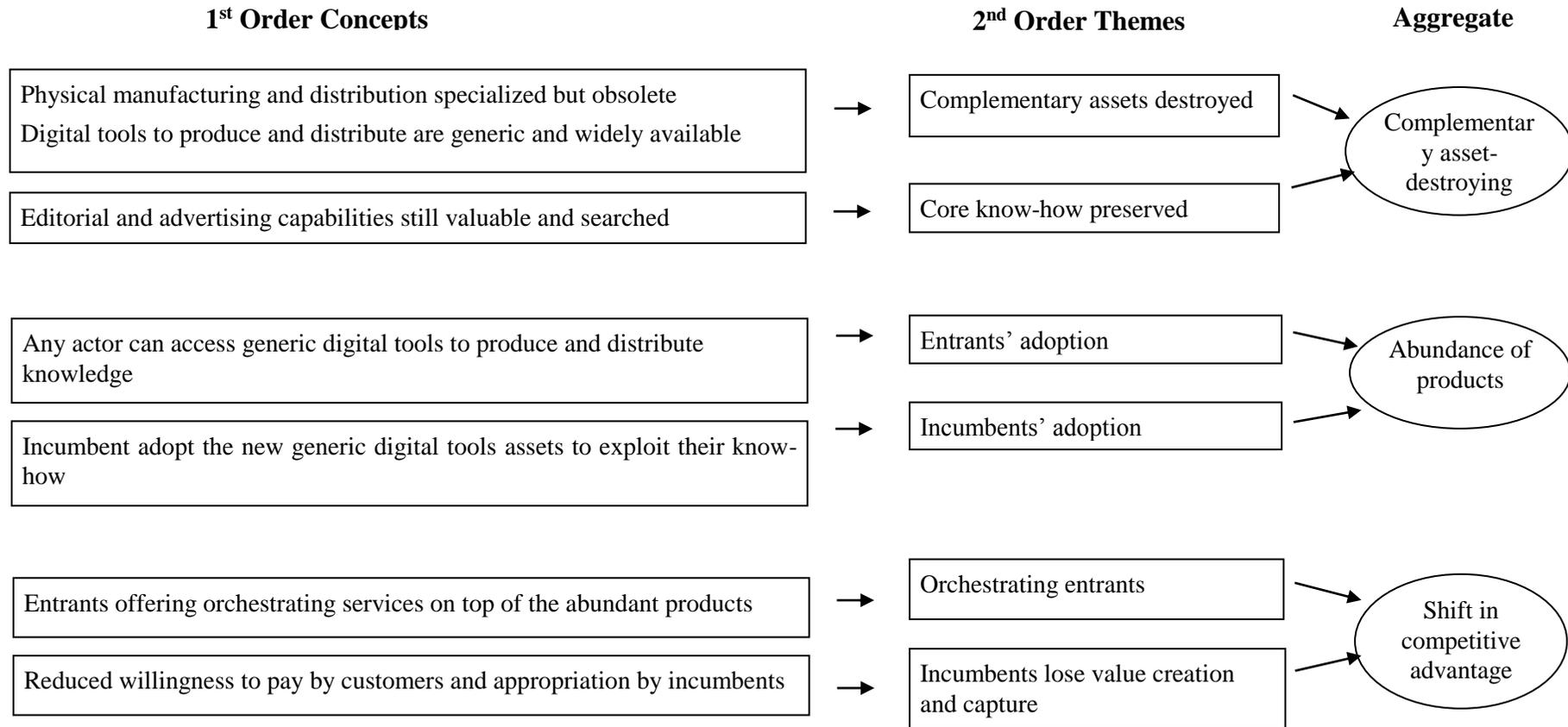
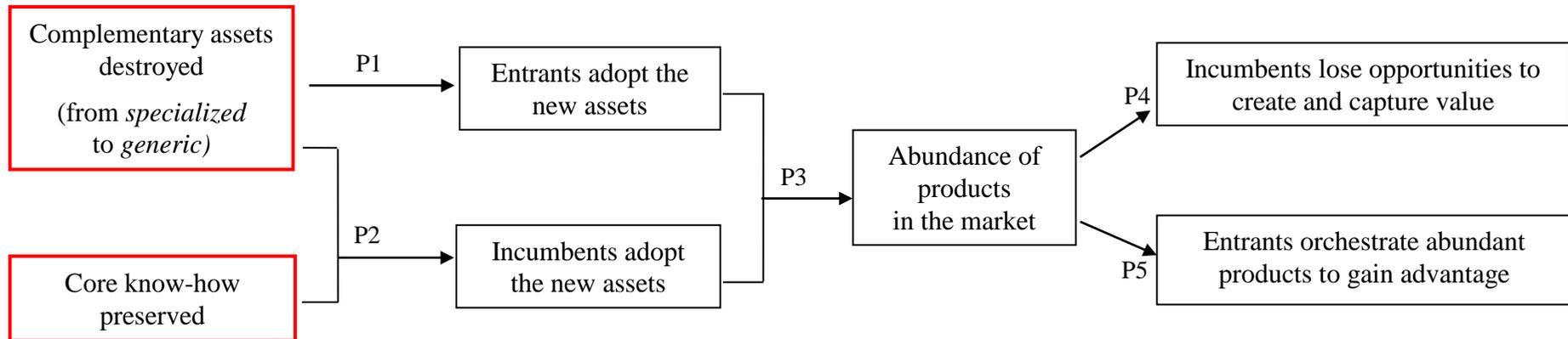


Figure 2. A model of Complementary Assets-Destroying Discontinuity



APPENDIX

Table A1. Selected Key Informants

Companies & Newspapers	Informant's role(s)	# of interv.s
<i>Cases</i>		
NationalGazetteCo	President and Owner	2
NationalGazetteCo	Director Plant technologies	1
NationalGazetteCo	Director Distribution	2
NationalGazetteCo	GM Digital Division	3
NationalGazetteCo	Director Digital Division	3
NationalGazetteCo	CEO of the Ad Sales House	1
NationalGazetteCo	Web&Mobile Marketing Director	2
NationalGazetteCo	Marketing Director of National Print	1
NationalGazetteCo	Facility and Property Manager	1
NationalGazetteCo	Product Manager	2
NationalGazetteCo - NationalGazette	Journalist and Manager Digital Division	3
NationalGazetteCo - NationalGazette	Former Internet & Multimedia Strategist	2
NationalGazetteCo - NationalGazette	Project manager Digital Division	3
NationalGazetteCo - NationalGazette	Editor-in-chief of the website	2
NationalGazetteCo - NationalGazette	Editor and syndicate member	1
MediaCo	President	1
MediaCo	Director Digital Division	2
MediaCo	Planning, Production and Customer Operation Director	2
MediaCo	Circulation Manager and Head of Operations	2
MediaCo	Director Diffusion	1
MediaCo	CEO of the Ad Sales House	1
MediaCo	Senior Controller	2
MediaCo – NationalCourier	Editorialist	1
MediaCo – NationalCourier	Former Managing Editor of the website	3
MediaCo – SpecializedGazette	Editor-in-chief of the website	3
MediaCo – SpecializedGazette	Editor and labor union member	1
MediaCo – SpecializedGazette	Marketing Director printed newspaper	2
LocalSouth	CEO	3
LocalNorth	Assistant Editor	2
Local NorthCo	CEO	2
Local NorthCo	Chief Digital Officer	2
SpecializedCourier	Vice Managing Editor	3
<i>External experts</i>		
TechCoA	Chief architect and co-founder	1
TechCoB	Strategic Partnership Development	2
TechPartner	Chief Revenue Officer	1
TechPartner	Chairman and CEO	2
FIEG	President	1
FIEG	Head of FIEG Research Center	3
AGCOM	Head of Media Market Analysis	1
Audipress	Director of the Institute	1
<i>Other interviewed experts</i>		
IAB Italy	General Manager	2
RAI (national broadcaster)	Writer of Giornali.it	3
Avvenire (national community newspaper)	Editor-in-chief of the website	1
AdRise (digital startup 1)	Head of Business Development and Strategy	1
Watchup (digital startup 2)	CEO and founder	1
ADmantX (digital startup 3)	CEO	1
Populis (digital-native media 1)	President and Co-Founder	1
Banzai (digital-native media 2)	President and Co-Founder	2

Table A2. Further details on Methods

Interview protocol	Documentation sources	Observation sources	Trustworthiness of data
We initially asked each informant to talk about himself/herself in the company, to highlight the story and characteristics of each newspaper, and to elaborate on how their company had approached the web since 1995. Once our cross-case comparison made some constructs and relationships more evident, we started asking how the Internet had impacted their businesses and their organizational competences and assets, what had been the major consequences for the way publishers operate online and offline, and what had been the characteristics of entrants that gained advantage.	AGCOM - Italian Communications Authority; Italian Antitrust; FIEG - Italian Federation of Newspapers and Periodical Publishers; ADS – the Italian Audit Bureau of Circulation; Nielsen Media Research Italy) Columbia Journalism School; Reuters Institute at Oxford; Nieman Foundation for Journalism at Harvard; MIT Media Lab; PEW Research Center; OECD; European Commission.	A few examples of these conferences were TechCrunch-Italy, the International Journalism Festival in Perugia, the International Advertising Bureau conferences in Milan, the Online News Association seminar in Atlanta, and the annual conference of FIEG.	We dedicated three years to data collection and analysis, gathering multiple interviews with different informants. We developed a deep understanding of the field by interviewing many experts and new entrants in and outside of Italy to control for possible differences in the observed phenomenon, and by attending industry events. Our varied set of accounts, interviews, documentation, and observations were recursively triangulated. To have an external control on the interpretation of our data, we invited a number of key informants and qualitative researchers to read the final paper.

Table A3. International empirical evidences

User generated content – UGC	Paywall and unwillingness to pay
<p>The phenomenon has similar sizes in the U.S.: by 2007 the country was home to 70 million blogs producing 1.5 million posts per day (Technorati, 2007). Looking globally, consider the 400,000 diplomatic documents about the Iraq War released by WikiLeaks in 2010, or the immense number of tweets produced by civilians during the Arab Spring in 2011.</p>	<p>The phenomenon was not limited to the Italian newspaper industry. In 2011 in the U.K., the newspaper <i>The Sun</i> lost 90% of its online audience after creating a pay wall. In fact, historically only two highly specialized newspapers in the world have succeeded with an online payment strategy: the <i>Wall Street Journal</i> and <i>The Financial Times</i>. In general interest news, <i>The New York Times</i> has been successful with a metered pay wall created in 2012, but it remains an outlier.</p>

ESSAY 2. Technological Change and Two-Sided Markets: Evidence from the Italian Newspaper Industry³

Abstract

This article examines how technological changes affect network externalities and platform revenues in two-sided markets. We identify two theoretical mechanisms. When a new technology opens new markets for existing products, not only does it cannibalize the size of existing markets (installed base effect), but it also facilitates transactions among members of new markets (efficiency effect) at the expenses of old markets. By doing so, new technologies devalue existing externalities, and negatively affect the revenues captured by platforms. Panel data regressions on the Italian newspaper industry for the period 2004 – 2012 support the hypotheses. A final qualitative study based on 30 in-depth interviews and on archival data further validates and contextualizes the mechanisms.

1. Introduction

A traditional view in economics (e.g., Farrell and Saloner, 1985; Katz and Shapiro, 1985) postulates that in the presence of network effects, the value of a product depends on the number of existing customers or the presence of complementary products. Firms that control large installed bases or more complements can deliver more value to customers and gain a dominant position. Network effects or externalities also may be prominent in the context of multisided platform markets, in which two or more groups of customers (or markets) connect through a platform, such as when credit cards match cardholders and merchants. Scholars use the term “cross-side network effects” to refer to the value that customers in one market

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perceive due to the presence of customers in markets on the other side (e.g., Parker and Van Alstyne, 2005; Rochet and Tirole, 2003).

A common denominator across these research traditions has been the emphasis on network size as a value driver. Accordingly, companies have sought to reach large masses of customers or complements quickly, adopting winner-take-all strategies (Gawer and Cusumano, 2002; Shapiro and Varian, 1999). Yet some firms fail, regardless of their large user base: MySpace, Netscape, and RealNetwork also achieved early substantial customer bases but could not maintain their dominant positions in the long run (Eisenmann, Parker, and Van Alstyne, 2011; *Forbes*, 2011). In response, scholars have investigated the potential influence of factors other than the installed base, such as entry time, a learning orientation (Schilling, 2002), the strength of network ties (Suarez, 2005), consumer preferences (Cennamo and Santalo, 2013), or network structures and conduct (Afuah, 2013).

We propose another determinant: the role of technological innovation. Research into network effects mainly studies how externalities influence technological evolutions, such as technical standards' emergence (see Schilling, 2002; Soh, 2010). The opposite causality, or how technological innovation influences network externalities, has not been extensively addressed (cf. Venkatraman and Lee, 2004). Yet technological innovation could “render[] the network obsolete or enable[] network providers to improve product benefits enough to overcome the network size advantage” (Afuah, 2013: 260). We examine how the arrival of new technologies (Tushman and Anderson, 1986; Utterback and Suarez, 1993) might influence the value of existing cross-side externalities and therefore revenues captured by platforms.

For our empirical analysis we consider the newspaper industry, because newspapers serve as platforms that match readers and advertisers (Seamans and Zhu, 2014) and because this

industry has undergone significant transformations due to Internet technologies. Our data set, obtained from the Italian publishing industry, features longitudinal data about 56 newspapers (99% of the entire population) between 2004 and 2012. We also conducted 30 in-depth interviews with key industry informants. This combination and triangulation of quantitative and qualitative data offers strong support for our theoretical arguments (Jick, 1979; Sutton and Rafaeli, 1988).

We obtain two major findings. First, new technologies can encourage sales of existing products through novel markets that tend to cannibalize the prior old markets, and consequently their cross-side externalities. In our study setting, newspaper websites cannibalize the installed base of printed newspapers, because some readers abandon the print format for the online offer. The reduced offline customer base leads advertisers to perceive less value and reduce their investments in print. Second, technological changes modify the efficiency and quality of the network transactions. In an econometric analysis, we find that advertisers reduce their investments in offline newspapers more than would be predicted on the basis of the cannibalization effect. We speculate that online websites might have offered advertisers new benefits. Our interviews confirm that online markets improved the targeting and measurement of advertising campaigns, which granted advertisers new options and contextually diminished the perceived value of traditional print advertisements.

With these findings, our research extends studies on network effects (e.g., Afuah, 2013; Cennamo and Santalo, 2013; Schilling, 2002; Suarez, 2005) by showing how a technological innovation that opens new markets for existing products changes the potential for value creation in multisided platform markets. We highlight that cannibalization effects may be at play, but innovations also can increase the possibilities for efficient transactions (e.g., Bakos, 1997; Williamson, 1981), which represent new sources of value in new markets, at the

expense of old ones. Thus for platforms, a competitive advantage based solely on an installed base may not be sustainable when technological innovations reconfigure the network structure (Eisenmann, Parker, and Van Alstyne, 2011). As a corollary, this study offers new insights to explain incumbent failures in two-sided markets. That is, the difficulty that companies face when they must adapt to technological changes could clearly depend on competence destructions (Tushman and Anderson, 1986) and cognitive biases (Tripsas and Gavetti, 2000) but also on how technologies affect network externalities by changing the structure (quantity and quality) of the transactions. Finally, this study sheds light on business models (Afuah and Tucci, 2000; Casadesus-Masanell and Zhu, 2012); previous research has provided relatively few details about how business models adapt to rapidly changing technologies and markets (Gambardella and McGahan, 2010; Zott and Amit, 2008). Our study contributes by suggesting that when a new technology devalues existing externalities, incumbents must reshape existing business models, because network effects are not sufficient to defend a dominant position.

In the next section, we present our theoretical background, which leads into our hypotheses. Next, we describe the research setting and data, then detail the findings from our panel data analysis and qualitative study. Finally, we note some conclusions and implications.

2. Theory and Hypotheses

Economic literature on network externalities (e.g., Farrell and Saloner, 1985; Katz and Shapiro, 1985) introduced the concept of network effects, distinguishing between direct and indirect versions. Direct network effects refer to the value a user derives from the presence of many other consumers of a product or service. Indirect network externalities arise when a user of a product or service derives value because additional complementary products are available

(Katz and Shapiro, 1985). In both cases, the value driver is the size of the network, whether defined by the number of users or complements. A large installed base increases product prices (Brynjolfsson and Kemerer, 1996), suggesting that users find a product that is adopted by many other users more valuable. Economides (1996) also observes that the number of complementary goods available for a specific product generates positive value for that product and increases its consumption. Greater availability of complementary goods also increases users' installed bases, which positively influences economic returns (Wade, 1995).

Multisided market and platform competition literature extends these arguments (Parker and Van Alstyne, 2005; Rochet and Tirole, 2003). A platform connects and enables interactions among interdependent groups of customers. In this context, network effects are “cross-side,” because they refer to the value that users of a market derive from the presence of many other users in the opposite market. For examples, real-estate agencies and card payment systems are platforms, because they match sellers and buyers; most media industries also are platforms, because they connect advertisers and audiences. The unitary value that members in such markets obtain is a function of the number of participants in the opposite market (Rochet and Tirole, 2003). As Venkatraman and Lee (2004) show empirically, the benefits and incentives of game developers to produce titles for a console depend on the size of the installed base of users of that console. In general, platform studies indicate that the value of cross-side externalities depends on the installed base of the market controlled by the platform. A platform generates profits by coordinating and enabling exchanges among large markets and internalizing some of the value of the cross-side externalities (Boudreau and Hagiu, 2009; Parker and Van Alstyne, 2005; Rochet and Tirole, 2003). Because the value exchanged among markets increases with their size, platforms should be more successful when they manage large installed bases.

Many seminal studies on network externalities explain technological innovations and standard wars. A technology likely dominates if there are many available complementary products or users that generate positive externalities for suppliers, manufacturers, and consumers (Evans and Schmalensee, 2010; Schilling, 1999). Thus, prior literature primarily has used externalities to predict technology selection and adoption, addressing network effects as independent variables and technology as the dependent variable (cf. Venkatraman and Lee, 2004). By investigating a technological change that affects an existing two-sided market, we instead consider the impact of technological changes on externalities.

2.1 Technology, platform, and network Size

Technological changes can open new markets for existing products (Christensen and Bower, 1996; Henderson and Clark, 1990), but established companies often must serve both old and new markets if they hope to maintain their market position (Gilbert, 2006; O'Reilly and Tushman, 2004; Siggelkow, 2001). We propose a schematic representation in Figure 1. In Panel a, we depict a platform that connects two groups of customers, Market 1 and Market 2, before the advent of the new technology. For this study, we focus on the revenues that the platform captures from Market 2 (thick arrow), who perceive externalities due to the presence of Market 1 (thin arrow).⁴ Our unit of analysis is the platform and its potential revenues from Market 2. Then in Panel b, we depict the situation after the advent of the new technology, in which the revenues we focus on are fraction of the existing externality that old Market 2 gained from old Market 1. We use the terms “old” or “existing” interchangeably, to refer to the cross-side externalities that existed prior to the technological change. For this study of the

⁴ To simplify the analysis, we focus on only one cross-side externality from Market 1 to Market 2, and assume the cross-side externality in the opposite direction (from Market 2 to Market 1) is negligible. We also assume that the platform (the company mediating exchanges) remains one before and after the technological change.

effects of new technologies on old externalities, we do not consider potential new revenues from new Market 2.

--Include Figure 1 about here--

We start by theorizing about the size effect on the installed base. Technological advancements can cause a substitution effect (Tushman and Anderson, 1986; Utterback and Suarez, 1993; Klepper, 1996). It is a typical consequence when products sold in the old and new markets are perceived as equivalent on comparable attributes, but new markets are superior on certain aligned differences, such as prices, efficiency, or time to market (Christensen and Bower, 1996; Zhang and Markman, 2001). Technologies often advance by offering greater efficiency, along either existing or new technological trajectories (Dosi, 1982). The concept of discontinuous change stems from the fundamental premise that technologies induce jumps in price-to-performance ratios (Tushman and Anderson, 1986). Efficiency improvements create better possibilities for exchanges and transactions. Therefore, if a new Market 1 cannibalizes an old Market 1, the externality that old Market 2 received from reaching old Market 1's customers declines. That is, the effect of the cannibalization of the installed base in a market propagates, through the externality, to the revenues that the platform captures in the second market. We therefore hypothesize:

Hypothesis 1: In a two-sided market, when a technological change opens new markets for an existing product, the revenues that the platform extracts from the externality between the two old markets diminish.

2.2 Technology, platform, and transaction possibilities

A technology that significantly improves transaction possibilities also can affect value creation in two-sided markets. The benefit for individual members in a network is a function of network size, and size also increases the likelihood of exchanges (Katz and Shapiro, 1985; Parker and Van Alstyne, 2005). However, size cannot fully explain why some technologies or

platforms succeed. Schilling (2002) shows that a firm's learning orientation and entry timing help predict technology success, in addition to an installed base of customers and complements. Suarez (2005) extends by describing how the strong ties of wireless operators with other countries' operators drove the adoption of certain technological standard, more than the total installed base of the network. According to Shankar and Bayus (2003), Nintendo acquired a dominant position due to its network strength, even though its network size was smaller than Sega's. Cennamo and Santalo (2013) also recognize that achieving large installed bases does not always lead to a higher platform performance in the U.S. video game industry, because consumer preferences produce varying willingness to pay. Finally, Afuah's (2013) theoretical framework illustrates how the value perceived by network members and providers depends on a broad array of attributes related to the network structure and the conduct of its members. For example, Afuah (2013) illustrates two networks, phone and card holder systems, that generate different value for their respective members because they use different structures. With a similar network size, variance in the number of connections and bidirectionalities in the phone network support more potential exchanges, which increases the value for members.

We accordingly expect that when a new technology significantly improves chances to search, coordinate, and exchange (Amit and Zott, 2001; Bakos, 1997), and thereby reduces transaction costs in general (Williamson, 1981), it adds value for network members. The theoretical implication of this argument is that when a new technology opens a new Market 1 with better transaction possibilities, the value that old Market 2 derives from old Market 1 diminishes (see Figure 1, Panel b). This value reduction may result not only from the cannibalization of the installed base of the old Market 1 but also from the relatively poorer

efficiency of transactions in the old markets. That is, the new technology devalues the cross-side externality that old Market 2 gains from old Market 1.

Transaction costs and capabilities are highly complementary in determining how firms organize their activities (e.g., Jacobides and Winter, 2005). A platform's revenues depend on its capability to facilitate transactions among markets, which enables it to capture a significant portion of the exchanged value. However, the market power and the role of a platform in facilitating transactions between groups of customers might become less valuable if an innovation reduces the transaction costs for this two-sided market. Old Market 2 can pay or buy less from old Market 1, if customers in new Market 1 are easier to reach. This diminishes the value offered and captured by the incumbent platform that links these two old markets.

In summary, the value of the cross-side externality between two existing markets (old Markets 1 and 2) decreases when a new technology makes the connections between the two groups of customers more efficient elsewhere. In turn, the revenues that the platform extracts from the old externality tend to decrease, not due to cannibalization of the installed base but because of externality devaluation. More formally:

Hypothesis 2: In a two-sided market, when a technological change opens new markets for an existing product, the revenues that the platform extracts from the externality between its two old markets diminish, beyond the effect of network size.

3. Quantitative Study

3.1 Research setting

The empirical setting is the Italian newspaper industry, during its transition from a fully offline to an online business. We selected this industry primarily because it is a quintessential case of a two-sided market (Parker and Van Alstyne, 2005; Rochet and Tirole, 2003): Newspaper publishers act as platforms that match readers (Market 1) and advertisers (Market

2), by selling content to the first group and advertising space to the second. It features positive cross-side externalities that advertisers reap by catching readers' attention. In 2012, the Italian newspaper industry derived approximately 55% of its total revenues from advertisers and the remaining 45% from readers (FIEG, 2013). For ad revenues in particular, 85%–90% come from selling display ads to commercial clients, with the rest attributable to classified ads (FCP, 2012). The industry is quite old: *La Gazzetta di Mantova*, a regional newspaper that sold 10 million copies in 2012 (FIEG, 2013), is one of the oldest continuing newspapers in the world, having been published since 1664.

This setting also offered an appealing study because the Internet has represented a major technological change for this business (Gilbert, 2005, 2006; Tushman et al., 2010), affecting both its underlying technology and its existing business model. After its emergence, newspaper publishers started serving their two offline markets of readers and advertisers (i.e., old Market 1 and old Market 2), as well as the newly opened markets of online readers and online advertisers (new Market 1 and new Market 2). The transformation required a competence renewal, but it also enhanced publishers' offers, in the form of constant news updates, videos, real-time interactions, and so on. The total audience of Italian newspapers rose by 4 million users between 2000 and 2009 (Audipress, 2012), though the industry's profitability declined, and the number of paper copies sold dropped by 33% between 2000 and 2012. The revenues earned from readers fell only 2%, because of a concurrent increase in the cover price, but offline advertising revenues declined by 41% (FIEG, 2000; FIEG 2013). The price of a print ad also fell by 49% from 2002 to 2011 (ASIG, 2012). Despite these declines, offline advertising still represents the majority of ad revenues, whereas online ads accounted for just 4.1% of Italian publishers' total revenues in 2012 (FIEG, 2012). Similar declines mark traditional newspaper business models in various countries; in the United States for example,

Seamans and Zhu (2014) show that Craigslist's entry into the classified ad business led to a \$5 billion loss for newspapers during 2000–2007.

3.2 Data

Our database includes newspaper-level data for 56 publications (99% of the Italian newspaper population) during 2004–2012. The data set includes multiple sources. From the annual Italian Federation for News Publishers (FIEG) studies, we collected data related to newspaper advertising revenues, offline newspapers' product success (i.e., number of copies sold), and changes in the organizations that sell ad space for publishers (i.e., advertising sales houses). From a national yearbook (*The Great Italian News Industry Book*), we gathered data about changes in the managing editors of each newspaper, the cover price for offline copies, the year of its founding, and the dates of major rotary press innovations by each publisher, as well as the capital stock of the publishing companies and other similar data. To assess the product success of each newspaper website in terms of its unique audience, number of pages viewed, and time per session, we contacted Nielsen Media Research Institute. The measure of the cumulative number of journalistic awards was *Premiolino*, the oldest and most prestigious Italian journalistic prize (equivalent to the U.S. Pulitzer Prize). For many data, we cross-checked and integrated them with similar data from alternative or original sources. For example, the Audit Bureau of Circulation also provided data about offline newspaper copies sold and their cover prices, and the Federazione Concessionarie Pubblicità (FCP, or Federation of Ad Sales Houses) provided details about the evolution of offline ad revenues. The Italian Authority for Communications also helped us double-check and integrate some specific data.

In our sample, most newspapers started experimenting with a web service around 1998–1999, though *L'Unione Sarda*, a local newspaper, already provided web functions in 1994,

and the national newspaper *la Repubblica* did so in 1996. By 2000, nearly all Italian newspapers had a web presence, but after the dot.com collapse in 2001, only by 2005 did online Internet penetration in Italy reach at least 10% of the population (World Bank, 2013). Therefore, we initiated our data analysis in 2004, to anticipate the moment the Internet started to really take off by one year.

3.3 Dependent variable

Platform Revenues from Old Externalities. It represents the value that the platform captures from its existing cross-side externality. We measure it as the yearly offline advertising revenues that each newspaper captured from its advertisers. In a two sided-market, the value internalized and captured by a platform (i.e., revenues newspapers get from advertisers) is a function of the value that the platform helps create (i.e., value that advertisers perceive from reaching readers). Thus, the value captured is easier to quantify than the value created through the cross-side externality, but it offers a good proxy. The more advertisers perceive value from their access to readers, the more newspapers gain revenues from advertisers. Therefore, we use the revenues that publishers extract from offline advertisers to measure the value created by the cross-side network externality between readers and advertisers.

3.4 Explanatory variables

Success Old Market 1. It measures the success that a platform obtains in its old Market 1, in terms of products sold. We use the yearly number of copies sold by each newspaper through kiosks and offline subscriptions. This measure provides an objective representation of the network size of offline readers.

Success New Market 1. The construct mirrors the first explanatory variable and refers to the website maintained by each newspaper. As a measure of product success in the new

market of readers, we adopt the most common and certified metric available: unique audience.⁵ It indicates the number of non-repeated online readers who visit each website at least once in a month. We collect, for each newspaper and for each year, audience data for June, which is a good proxy for the yearly average, according to our data provider.

3.5 Control variables

Platform age. We made a cumulative count of the years of existence of each newspaper. Newspapers have introduced their brand, content, and services to different markets, ranging from online websites to mobile apps. Yet the institution serving these markets has remained fixed over time, and its age might affect readers, and indirectly advertisers, because it helps establish the newspaper's authoritative tone and trustworthy relations with the community.

Editor experience. Each newspaper is managed by an editor-in-chief, who is responsible for the strategy and operations of the publication. Given this influence over the editorial and market positioning of the newspaper, the editor's experience likely defines success with readers and advertisers. The measure uses the cumulative years of the editor's tenure.

Platform quality. This variable captures the editorial quality of each newspaper, according to the cumulative number of journalistic awards it has won since its founding. Editorial quality should affect the type of advertisers and their willingness to pay, as well as the number of readers.

Innovation in the old market. During the focal study period, newspapers continued to invest in their old market. The major innovation they introduced was a full-color rotary press. Publishers that invested early in this new technology might have attracted and maintained more offline readers and advertisers, until other newspapers also switched from black-and-

⁵ Nielsen Media Research measures the unique audience as the total number of persons visiting a website at least once in a month, who are counted only once even if they visit the same website multiple times. Thus, this

white to color. To measure this source of competitive advantage, we collected data about the year each newspaper launched a full-color edition, then computed the cumulative years of experience with the new press.

Changes in vendors. Platforms often need sales forces to facilitate transactions between their two separate groups of customers. Newspapers rely on sales agents to sell readers' attention to advertisers. Larger publishers often incorporate these sales agents into their firm and create dedicated ad sales houses, while smaller publishers generally outsource sales responsibility to larger publishers (national or local). We use two dummies, one for changes to the local vendor and one for changes to the national vendor. Changing sales agents might affect advertisers' benefits and the revenues extracted from them.

Company size. The size of the company that owns each newspaper, in terms of wealth, can influence its ability to serve readers and advertisers. For each publishing company, we collect yearly capital stock.

Country growth. We measure the yearly growth rate of the gross domestic product of a country and thereby control for changes in readers' ability to spend to purchase newspapers and advertisers' ability to invest in advertising campaigns.

Technology growth. The adoption and diffusion of new technologies by consumers can affect the success of platforms operating in new technological domains. To proxy for the evolution of online digital technologies in the selected country, we use broadband penetration.

Table 1 illustrates the summary statistics and correlations for all the variables.

--Insert Table 1 about here--

3.6 Statistical method

monthly metric cannot be summed to the yearly level or averaged.

We used panel data fixed effect models to test the two hypotheses, with the following estimation:

$$\text{Platform Revenues from Old Externalities}_{i,t} = \text{constant} + \alpha_1 \text{Success Old Market } I_{i,t} + \alpha_2 \text{Success New Market } I_{i,t} + \beta X_{i,t} + \Phi_i + \varepsilon_{i,t}$$

where i is the newspaper, t indicates time, X is the vector of control variables, Φ_i indicates platform fixed effects, and ε refers to the vector of residuals. By using platform fixed effects, we can account for platform-specific unobserved heterogeneity and its potential influence on our dependent variable. In addition, we included instrumental variables (IV) to address the endogeneity problems emblematic of two-sided markets, which result from the circular effects caused by network externalities (Cennamo and Santalo, 2013). In our model, endogeneity stems from the feedback between the number of copies sold (*Success Old Market 1*) and the number of website users (*Success New Market 1*). Success with offline readers might increase success among online readers, and at the same time the success of a newspaper website could reduce the number of copies sold. Because our estimates of the influence of these two variables on platform revenues could be inconsistent, we turned to a two-stage least squares (2SLS) estimation and used three IVs that related to the endogenous variables in the first stage but were unrelated to the dependent variable in the second stage (Kennedy, 2003). First, *Cover price* is the price at which publishers sell offline copies, which influences the number of offline readers but does not affect the number of online readers. Second, we subtracted from both endogenous variables—namely, offline copies sold and online audience—their respective cumulative averages, then took the one-year lag of the newly generated variables to generate the other two IVs. This methodology, based on a dynamic panel logic, is known as the Arellano-Bond (1991) estimator (see also Bhargava and Sargan, 1983). By taking the difference between the core variable and its individual time mean, we eliminate the fixed

component of the error term, whereas the lag makes the IV correlate with the core variable but not with the unobserved component of the error term. We label these two instruments *Copies Arellano-Bond* and *Audience Arellano-Bond*. We ran typical tests for the IVs: The F-test for strong instruments was significant and above 10; the Hausman test indicated a significant ($p < .01$) systemic difference between the IV and endogenous variables; and the test for overidentified restrictions revealed that the three IVs were correctly excluded from the second-stage regression and were uncorrelated with the error terms.

3.7 Results

Table 2 contains the results of our ordinary least square (OLS) estimates and subsequent 2SLS estimation. Our interpretation of the coefficients corresponds to standardized variables, with means of 0 and standard deviations of 1.⁶ The baseline Model 1 contains only the control variables, and Model 2 adds the endogenous variables. Model 3 represents the second stage of the 2SLS, accounting for the IVs. The sign of the coefficient of one of the endogenous variables, *Online Audience*, changed in the shift from Model 2 (.129; $p < .01$) to Model 3 (–.154; $p < .05$), that is, when we moved from an OLS to a 2SLS-IV estimation, which highlighted the importance of addressing endogeneity issues. The impact of copies sold on offline advertising revenues was positive and significant in both the OLS (.826; $p < .01$) and 2SLS (.729; $p < .01$) estimations. Therefore, revenues from advertisers were higher when newspapers guaranteed larger offline readerships, confirming a central prediction of network studies about the positive relationship between value (created and captured) and network size.

--Insert Table 2 about here--

⁶ We standardized all the variables to facilitate our interpretation of the coefficients, because the original variables were very different in scale. The results of our regression, run on the standardized variables, were identical to those obtained with the original (unstandardized) variables, and the significance of each effect was not affected by this transformation.

Model 4 in Table 3 represents the first stage of the 2SLS estimation, in which we regressed the two endogenous variables on the selected IVs. The *Audience Arellano-Bond* IV had a negative, significant effect on copies sold ($-.148$; $p < .01$), suggesting that the online success of newspaper websites negatively influenced the number of paper copies sold, in support of the predicted cannibalization between the old and new markets for readers. The bottom of Table 3 also shows that the reverse causality, from copies sold (*Copies Arellano-Bond*) to online audience, was much weaker ($-.041$; $p < .05$).

--Insert Table 3 about here--

Overall, Model 4 confirmed the cannibalization of offline newspapers by their online counterparts ($-.148$; $p < .01$).⁷ In addition, Model 3 showed that increasing the number of copies sold positively influenced offline advertising revenues ($.729$; $p < .01$). Therefore, we combined the two effects and determined, in the first stage, that a standard deviation increase in online audience decreased the number of copied sold by $-.148$. The second stage then indicated that a one standard deviation increase in copies sold increased offline advertising revenues by $.729$. In summary, a one standard deviation increase in the online audience causes a loss of $-.11$ in offline advertising revenues, in support of Hypothesis 1. The cannibalization of old Market 1 by new Market 1 diminished the revenues that the platform captured from old Market 2, due to a installed base effect.

Our results also suggested a second interesting stylized fact. Using the 2SLS-IV procedure, we measured the additional effect of the two IV (copies sold and online audience) on platform revenues, after controlling for the reverse causality between the variables. The negative coefficient of $-.154$ in Model 3 (second-stage) therefore reflected the effect of the online

⁷ Economists also note the problem of substitution or complementarity of information goods in the transition from offline to online (e.g., Forman, Ghose, and Goldfarb, 2009; Gentzkow, 2006; Goldfarb and Tucker, 2011).

audience on platform revenues, after we controlled for how this variable indirectly affected platform revenues (through the impact on offline copies sold). A one standard deviation change in the online audience resulted in a net $-.156$ reduction in platform revenues, beyond the installed base effect, in support of Hypothesis 2.⁸

4. Qualitative Study

In the research we alternated phases of deduction and induction, to develop and strongly support our arguments (e.g., Jick, 1979; Sutton and Rafaeli, 1988). This section presents the findings of our qualitative study, which helps to contextualize and generate a deeper understanding about the mechanisms behind our second hypothesis.

4.1 Method

Interviews. The study combined face-to-face interviews and archival data. We conducted 30 semi-structured interviews, including 20 newspaper managers and executives, 5 key advertisers and technology companies, and 5 experts in the domain of media and advertising. The informants from the newspaper companies were selected mainly from the two major Italian national newspapers (*Corriere della Sera* and *la Repubblica*), thus relying on potentially revelatory cases (Yin, 1994). The advertising executives represented both major ad agencies (e.g., WPP) and managers of large technology companies that offer ad services (e.g., Google, Facebook). Interviews lasted between 60 and 120 minutes, and each of them was taped, transcribed, and content analyzed, and we followed all major recommendations about qualitative research (e.g., Strauss and Corbin, 1990; Suddaby, 2006).

⁸ As a robustness check, we repeated all regressions by substituting the measure of product success in the new Market 1 as “time per person,” instead of “unique audience.” This metric captures the average time spent by unique users on each website in June (source: Nielsen Media Research). The hypotheses results were robust to this substitution.

Archival data. Findings from the interviews were constantly cross-checked with evidence from archival data. A large number of documents produced by major institutions between 1995 and 2012 were analyzed (e.g., FIEG, AGCM, AGCOM, OECD). International news sources were identified by using LexisNexis and Factiva, and we actively relied on *The Economist*, among others. Through Google Scholar we also identified, and then analyzed, academic articles on the specific topic of advertising (offline, online, and performance ads).

4.2 Results

The first finding that emerges involved the organization of the existing relationships between offline newspapers and their advertisers. The Director of Audipress, an Italian institute that collects data about media, explained:

By gathering data about the offline newspapers' readership, we offer advertisers the possibility to estimate the potential reach of their ad campaigns. Socio-demographic data about readers permit them to customize ad messages. Our survey data on the size and characteristics of newspapers' readership have always been valuable for ad planners.

Advertisers also used data about newspapers' sales before investing, not just survey data. The Managing Director of Accertamento Diffusione Stampa (in English, Audit Bureau of Circulation) noted that because "advertisers need certified data, we gather and check all data about newspapers' copies sold." Yet even as the informants from the offline data institutes stressed how valuable advertisers found their metrics, digital technologies clearly revealed some limitations associated with offline transactions. For example, offline publishers provide certified performance metrics to advertisers only after an extensive collection and certification processes is completed, which led to biannual reports by Audipress and a three-month lag for each certification by Accertamento Diffusione Stampa. In contrast, the Internet supported real-

time trading for online advertising. As the former Director of Digital Content and Product Development of *la Repubblica* noted, “The real-time communication of data is very important for advertisers, because ad buyers want to reach their potential customers exactly when those are on news websites.” Furthermore, digital technologies increased transactional transparency; the Marketing Director of National Print of *La Repubblica* recounted that “The unobservability of privately managed offline transactions allowed strong publishers to place different prices to different advertisers for the same ad space. Digital technologies, instead, allowed better measurement and comparisons, thus transferring value to advertisers in the form of prices that better reflect real consumptions.” A similar explanation of the benefits for advertisers came from the CEO of the ad sales house for *Corriere della Sera*:

Advertisers online have the possibility to pay only when a specific activity is really performed on their ad. This is the concept of performance ads, introduced by Google AdWords with its pay-per-click logic. When advertisers find similar possibilities online, they are happy, even if premium publishers have so far resisted to this sale method.

Thus, the value for advertisers from reaching readers online potentially is higher, because they benefit from real-time measures and greater accountability.

Other important value-related changes stem from the expanded possibilities for searching and targeting customers (Athey and Gans, 2010; Bergemann and Bonatti, 2011; Goldfarb and Tucker, 2011), as well as measuring their responses (Dellarocas, 2012), in online settings. Offline newspapers provided summaries of their readers’ characteristics (Chandra, 2009), but advertisers could only statistically predict the reach of their display advertisements. In addition, offline newspapers offered an aggregated installed base of readers. In contrast, digital technologies enable the advertiser to identify each user and target her or him with a

personalized ad. When we asked our interview respondents to describe how newspapers moved online, we received several clear descriptions:

At the beginning of the web, we felt we were in competition with Yahoo! and other portals, and we thus thought that everything was about large audiences. Therefore, we gave away our content for free to reach masses. Retrospectively, this was wrong, since we are now observing that successful online platforms are those that collect information about each of their single users, enabling advertisers to personalize and target each consumer (executive, *Corriere della Sera*).

The web has changed the way relations are organized. Before, advertisers needed to go through offline newspapers, but today they have the chance to search for specific customers and directly talk to them. Given this possibility for direct relation and the richer information about customers, web platforms are preferred since they enable new ways of communicating (former website Managing Editor, *Corriere della Sera*).

Even *The Economist* (2014: 8) recognizes that “The advertising industry is going through something akin to the automation of the financial markets in the 1980s. This has helped to make advertising much more precise and personalized.”

The simple aggregation of masses of customers, as was typical of print newspapers, thus may not be sufficient to generate value for advertisers, which instead have means to transact with single users, in effective ways. The cross-side externality that offline advertisers previously perceived, achieved by reaching many offline readers, thus became devalued. As the Web and Mobile Marketing Director of *la Repubblica* admitted:

Since the Internet has brought the concept of measurement and targeting to the extreme, the press has resulted in being the less effective media, according to those parameters. Advertisers want to use online news website.... The devaluation of print

does not stem from the drop in circulation, which is minimal compared to the plummet of ad investments in print. The speed of the two drops is not the same, but it is much higher for advertising. The reason is that online media tell advertisers that the ad campaign can be measured.

Overall, our qualitative study thus supports our theoretical predictions. The CEO of the ad sales house for *Corriere della Sera* offered an excellent summary: “Offline publishers have maintained their trustworthy relationship with advertisers, but the problem is that the web has introduced new parameters on which advertisers now base their value: accountability, measurement, targeting.”

5. Discussion

A large installed base of users or complementary products drives value in network industries (Katz and Shapiro, 1985; Parker and Van Alstyne, 2005; Rochet and Tirole, 2003). But other factors also can drive value in such contexts. Strategy scholars recently highlighted additional aspects such as entry time (Schilling 2002), network strength (Suarez, 2005), consumer preferences (Cennamo and Santalo, 2013) and the structure and conduct of networks (Afuah, 2013). We extend these suppositions by proposing that, in industries characterized by cross-side network effects, value creation changes due to new technologies, with strong implications for platform revenues. The question is practically relevant, in that many modern industries are organized as networks, platforms, or even complex ecosystems. We suggest that, in a two-sided market platform, a new technology that open new markets for an existing product affects the existing cross-side externality between old markets. The value of the existing externalities is altered by two distinct mechanisms. First, the newly opened markets cannibalize the size or installed bases of the old markets, thus diminishing the relative cross-

side externalities. Second, by facilitating transactions among members of new markets, new technologies reduce the benefits of exchanges in old markets, thus reducing the platform's central value proposition. The overall devaluation of existing cross-side externalities then affects platform revenues, because it reduces the value it can capture.

The tests of our hypotheses relied on dynamic panel data together with qualitative interviews, all reflecting the Italian newspaper industry as it has dealt with the emergence of the Internet during 2004–2012. With regressions, we show that newspapers' online audiences have cannibalized their offline copies sold, and the resulting reduction in the installed base of offline readers negatively affected the revenues that offline advertisers paid publishers. Even when we controlled for the declining offline readership, we found a negative, significant effect of the online audience on offline advertising revenues. Therefore, size of the installed base was not the only driver of value for advertisers. Our qualitative evidence confirmed that advertisers found it valuable to target each single reader and measure behaviors and transactions in real time, which was possible only online.

5.1 Implications for research and practice

This study offers several implications for both theory and managerial practice. For strategy literature pertaining to network effects and platforms (Afuah, 2013; Cennamo and Santalo, 2013; Schilling, 2002; Suarez, 2005), we specify that network size is only one of the possible drivers of value, and its relevance can vary due to technological changes. Additional drivers of value emerge when a new technology opens new markets that offer better transaction possibilities (Amit and Zott, 2001; Williamson, 1981). In turn, the exchanges among old markets become less effective, independent of their network sizes. The installed base—traditionally a valuable asset (Barney, 1986; Dierickx and Cool, 1989)—becomes gradually less important for sustaining a competitive advantage. As *The Economist* (2014: 10) reports,

“Behavioral targeting has complicated media companies’ lives because it has made their once-vital role of aggregating audiences for advertisers much less important.”

Regarding business model studies, our findings suggest that companies likely change their models when their traditional externalities come under threat. This is important because business models literature provides little insight into how existing models evolve (Afuah and Tucci, 2000; Casadesus-Masanell and Zhu, 2012; Zott and Amit, 2008). We hope further research examines how companies should respond, in old and new markets, to transformations in their value creation and capture possibilities. The evidence in the current study suggests a foundation for further research, in that it indicates a company might alter its business model by reducing its reliance on devalued cross-side externalities and adding more value for stand-alone customers instead. In the publishing industry for example, many companies reacted to offline advertisers’ lower willingness to pay by improving the editorial quality of their print versions, to increase the willingness to pay and prices charged to readers. Additional research also might analyze the contingencies under which firms can transform their two-sided business models into single-sided versions, such that if the firm remains in the two old markets, it serves them independently and relies less on externalities. Contextually, managerial decision makers should seek strategies that reduce their dependence on network effects, such as by deploying their firm’s core competences to enter adjacent markets. In the study setting, newspapers might use their editorial competencies to write pieces for advertisers for example, labeled as branded content.

Another potential approach would be to theoretically examine how firms exploit new technology through vertical integration. For years, Italian newspapers offered access to large online audiences, without collecting personalized information about online readers. More recently, they began investing in digital assets that offer advertisers a means to bid in real time

on single readers with certain characteristics, using behavioral and geolocalized ads. This approach could represent a basis for a different form of penetration for digital advertising. According to the CEO of the ad sales house for *la Repubblica*, “We need to develop computational competences. Shortly we will sell some of our ads using programmatic ad technologies, thus allowing advertisers to bid on readers and showing them specific impressions. We already signed with a data management platform and formed individuals for our trading desk.”

Firms in two-sided markets, operating in complex and evolving ecosystems, often struggle to understand the real drivers of success and failure. Prior studies of technological change suggest that the destruction of core competences and specialized assets (Rothaermel and Hill, 2005; Tushman and Anderson, 1986), and managers’ cognitive biases (Tripsas and Gavetti, 2000), are central causes of incumbent failure. We did not specifically address these problems, but our study demonstrates that platform companies (incumbents) can lose substantial revenues if the structure of their networks undergoes change. Therefore, additional research should analyze how the devaluation of externalities co-evolves with more established causes of failure, such as competence destruction and cognition, to provide a more fine-grained model of firm adaptation to and failure after technological changes.

Finally, our findings could be extended to platform markets in which technological changes offer new ways to sell existing products, such as when video entertainment and videogames move from television and consoles to tablets and smartphones. Other studies should replicate our findings in settings that feature different fixed costs and strategic resources too. Another interesting extension would be to measure the magnitude of cross-side externalities in new markets after a technological change. We focused on the negative

implications for the old market, without specifying the aggregate effect. Studies that address this point would be welcome.

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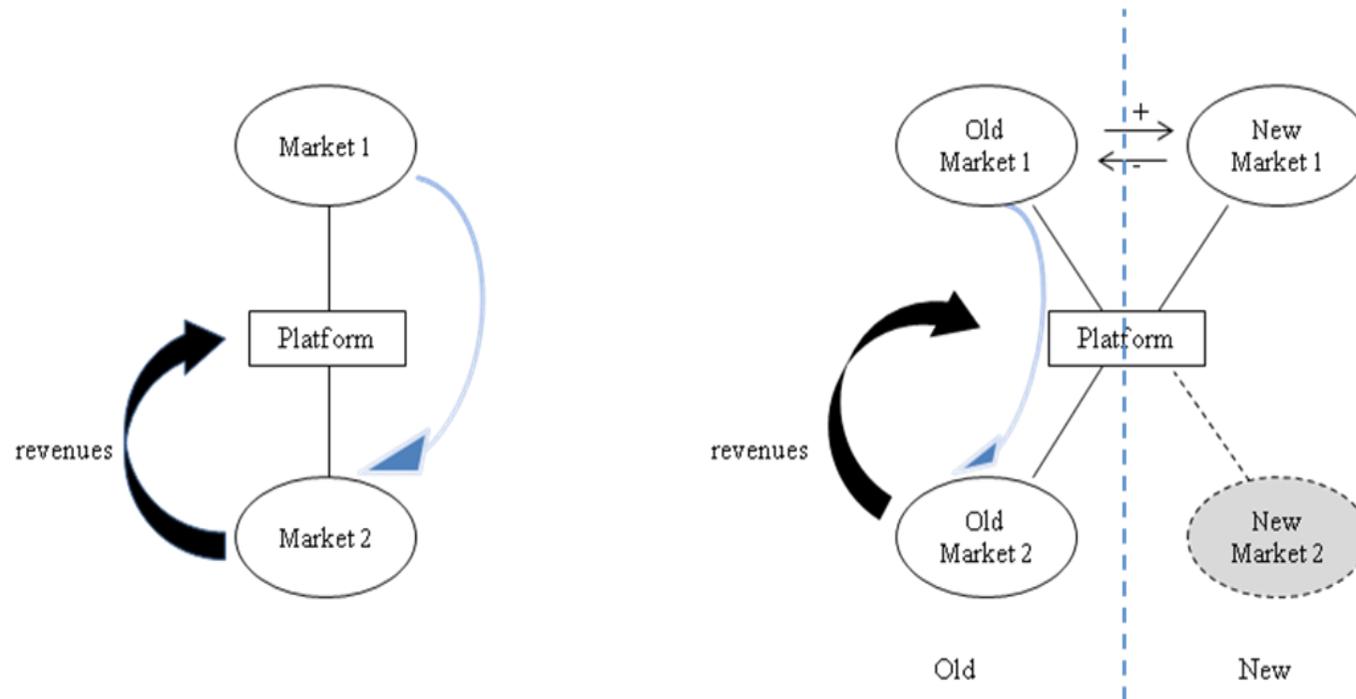
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7. Figures and Tables

Figure 1. Conceptual framework



The left panel (a) shows a traditional two-sided market, in which a platform extracts revenues from Market 2, that in turn perceives a cross-side externality from Market 1. The right panel (a) represents the two-sided market after a technological change that opens a new Market 1 for the same product sold in the old Market 1.

Table 1. Summary statistics and correlations

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Platform revenues from Old Externalities	2.86e-10	1	1.00												
2. Success old Market 1	2.96e-10	1	0.93	1.00											
3. Success new Market 1	-2.00e-10	1	0.82	0.79	1.00										
4. Cover price	-1.47e-08	1	-0.04	-0.05	0.15	1.00									
5. Platform age	3.78e-10	1	0.04	0.06	-0.01	-0.06	1.00								
6. Editor experience	-9.67e-10	1	0.01	-0.07	0.02	-0.02	0.06	1.00							
7. Platform quality	-6.97e-09	1	0.74	0.74	0.68	0.05	0.05	-0.05	1.00						
8. Innovation in the old market	-9.19e-09	1	0.28	0.29	0.30	0.40	0.05	0.09	0.22	1.00					
9. Changes in local vendors	2.09e-09	1	-0.04	-0.02	-0.01	-0.01	-0.03	-0.03	-0.04	0.00	1.00				
10. Changes in national vendors	1.93e-09	1	-0.06	-0.04	-0.03	-0.01	-0.01	-0.02	-0.00	0.04	0.48	1.00			
11. Company size	6.02e-10	1	0.44	0.41	0.37	0.09	0.04	-0.09	0.23	0.12	-0.04	-0.04	1.00		
12. Country growth	-1.02e-08	1	0.02	0.02	-0.06	-0.10	-0.01	-0.00	-0.00	-0.18	0.07	0.01	-0.01	1.00	
13. Technology growth	-3.26e-09	1	-0.03	-0.05	0.16	0.62	0.04	0.02	0.01	0.52	0.07	0.04	0.03	-0.36	1.00

Table 2. Ordinary least square and second-stage 2SLS estimations

Variables	Model 1 (OLS)	Model 2 (OLS)	Model 3 (2SLS)
<i>Independent variables</i>			
Success old Market 1	-	0.862*** (0.060)	0.729*** (0.146)
Success new Market 1	-	0.129*** (0.027)	-0.154** (0.061)
<i>Control variables</i>			
Platform age	-3.206*** (0.630)	-1.983*** (0.538)	-1.315* (0.724)
Editor experience	-0.025 (0.019)	-0.015 (0.016)	-0.001 (0.018)
Platform quality	-1.963*** (0.152)	-0.706*** (0.229)	0.368 (0.283)
Innovation in old market	0.015 (0.010)	0.005 (0.009)	0.002 (0.009)
Changes in local vendors	0.003 (0.007)	0.011** (0.006)	0.010* (0.006)
Changes in national vendors	-0.003 (0.007)	-0.002 (0.006)	-0.001 (0.006)
Company size	-0.085 (0.134)	-0.088 (0.111)	-0.008 (0.116)
Country growth	0.014** (0.006)	0.013** (0.005)	0.009* (0.005)
Technology growth	0.091*** (0.023)	0.067*** (0.019)	0.061** (0.030)
Constant	0.002 (0.013)	0.029** (0.015)	0.010 (0.023)
Observations	486	463	389
F test	170.13	74.83	75.44
R-square (overall)	0.1727	0.0200	0.2493

Notes: Platform revenues from old externalities are the dependent variable. Robust standard errors are in parentheses.

*** $p < .01$. ** $p < .05$. * $p < .1$.

Table 3. First-stage least squares estimates

Variables	Model 4 (2SLS)
Endogenous variable: Success old Market 1	
<i>Instrumental variables</i>	
Cover price	-0.008 (0.008)
Copies Arellano-Bond	0.113*** (0.010)
Audience Arellano-Bond	-0.148*** (0.017)
Endogenous variable: Success new Market 1	
<i>Instrumental variables</i>	
Cover price	-0.022* (0.014)
Copies Arellano-Bond	-0.041** (0.019)
Audience Arellano-Bond	0.647*** (0.031)

Notes: The first-stage F statistic is 128.46 for the first endogenous variable and 3.63 for the second endogenous variable.

ESSAY 3. Let's Open this Model! How Companies use Internal and External Knowledge for Competitive Advantage⁹

ABSTRACT

Organizations coping with technological and market changes can attempt to adapt by considering several routes, such as exploration and exploitation, forward-looking and backward-looking strategies, and other possibilities. In this paper we suggest that the transformation of a closed business model toward a more opened one is also a viable option, and we examine a process of pursuing it. Based on a longitudinal single-case study of the major Italian newspapers' publisher, GELE, we unveil how a company can increasingly open its boundaries to external contributors, while maintaining its closed model. At a more strategic level, the research shows how an organization can reposition itself in a fast-changing environment characterized by cost pressure. At the operational level, it highlights new mechanisms through which incumbents import and integrate external knowledge in their final offer.

1. Introduction

Incumbent firms that try to adapt to technological and market changes often encounter difficulties (e.g., Schumpeters, 1942; Tushman and Anderson, 1986; Henderson and Clark, 1990; Christensen and Bower, 1996; Tripsas and Gavetti, 2000). The growing complexity and turbulence in today's environments and the consequences of established companies' failure have stimulated researchers to intensively study the problem of incumbent adaptation. For instance, dynamic capability scholars have examined what makes some companies to succeed and other to fail in the face of discontinuous changes (e.g., Teece, Pisano, and Shuen, 1997;

⁹ The paper is co-authored with gianmario Verona (Bocconi University) and Frank T. Rothaermel (Georgia Institute of Technology). The authors acknowledge financial support from the Research Division "Claudio Dematté" of SDA Bocconi School of Management at Bocconi University and the ASK Research Center of Bocconi University.

Eisenhardt and Martin, 2000). Despite the considerable knowledge accumulated by the strategy and organizational change literatures, we lack an understanding of how the adaptation effort of companies relates to business model innovation (e.g., Zott and Amit, 2008). Often organizations adopt new technologies and then striving to find new business models that fit with them. Our paper precisely addresses this issue. We examine how incumbents respond to technological changes by transforming their closed business model in a more opened one. In particular, we investigate how incumbents benefit from opening their boundaries to external knowledge and contributions, what are the difficulties, and how they can be overcome.

Organizations like Linux, Google, Threadless, or Wikipedia are just a few examples of successful firms (for-profit or not-for-profit) based on a new paradigm of open collaboration and knowledge sharing (e.g., Chesbrough, 2003; Baldwin and von Hippel, 2011). More interestingly for our research question, also established organizations like P&G and The Guardian are adjusting their innovation and production processes by now including external participants. The impact of these transformations for their core business, and how they can be implemented, remains a challenge and a relatively overlooked aspect (e.g., Chiaroni, Chiesa, and Frattini 2010).

We conducted a longitudinal single case study of a major newspaper publishing houses in Europe, the Italian company Gruppo Editoriale L'Espresso (hereafter: GELE). By considering a broad time horizon that includes the advent and consolidation of the Internet (1995-2014), we could examine how the company launched several new 'open projects', ranging from book self-publishing to citizen journalism platforms. We use the comparison of successful and unsuccessful projects to inform our theory development about how a company transforms an existing model by increasingly accessing to external knowledge, while maintaining its traditional internal knowledge and processes.

Our major contribution refers to literature on incumbent adaptation (e.g., Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, and Winter, 2007), as we offer a new perspective on how firms master technological transformations by combining internal and external knowledge to reestablish their competitive advantage (e.g. Afuah, 2003; Afuah and Tucci, 2012). Our findings have also significant implications for business model literature (e.g., Gambardella and McGahan, 2010; Zott and Amit, 2008), since we illustrate how a partially devalued closed model can evolve with the inclusion of more opened forms of value creation. Finally, our specific perspective on openness and external knowledge also allows to establish new links with user and open innovation studies (von Hippel, 1986; Chesbrough, 2003).

2. Theoretical Background

2.1 Technological change and incumbent adaptation

A major challenge for companies are discontinuous changes in technologies, which cause jumps in performance, in the way things are done, and in how market needs are served (e.g., Tushman and Anderson, 1986; Henderson and Clark, 1990; Christensen and Bower, 1996). Facing similar challenges, entrants are often favored, while incumbents are trapped by path dependences and existing competences (e.g., Leonard-Barton, 1992) or by cognitive biases (e.g., Tripsas and Gavetti, 2000).

Despite these obstacles, sometimes firms overcome these limitations. Dynamic capabilities scholars theorized what drives adaptation and superior performance in the face of rapidly changing environments (e.g., Teece et al, 1997; Eisenhardt and Martin, 2000). March (1991) instead highlighted even more foundational elements for successful adaptation, such as the ability to explore and exploit, two opposite but complementary ways of learning and operating

Tushman and O'Reilly (1996) argued that, to create future businesses while maintaining the existing ones, successful companies simultaneously explore and exploit by showing an ambidextrous behavior (e.g., Raisch, Birkinshaw, Probst, and Tushman, 2009). Another theoretical lens proposes that managers need to combine forward-looking and backward-looking approaches to effectively navigate changing landscapes (e.g., Gavetti and Levinthal, 2000). A third view, more rooted in an engineering tradition, argues that companies need to balance efficiency and flexibility to be able to effectively change (Adler, Goldoftas, and Levine, 1999; Eisenhardt, Furr, and Bingham, 2010).

The illustrated theoretical approaches have been incredibly useful to characterize why certain organizations adapt better than others; however, we can still advance our understanding about how a technological and organizational adaptation relates to successful new business models. In fact, organizations sometimes take all steps to adopt new technologies, by also serve old and new customers, but still they struggle to find effective business models. Notable examples are the global newspaper industry after the Internet, the music industry, the book publishing sector, movies, academia, and so on – all cases in which companies' existing revenue streams are declining and new revenue streams are failing to grow. Companies make profits when they both create and capture value, that is when they have a workable business model (e.g., Zott and Amit, 2008). Interestingly, the advent of digital technologies has undermined existing business models in almost all sectors from telecommunication (SMSs vs WhatsApp) and taxi driving (licenses vs Uber) to banks (e.g., PayPal) and the mentioned knowledge industries (e.g., Netflix, Spotify, Facebook, BuzzFeed). It becomes relevant to ask how companies can innovate their existing ways of creating and capturing value. Moreover, given that transformations often occur by leaving a residual fit of the existing activities with the environment (e.g., Gilbert, 2006), parts of the existing business

models are likely to remain viable. Therefore, the problem becomes how companies find new business models while simultaneously maintaining their old ones, and how the two models interact. To tackle this broad question, we take a specific lens; we examine how an incumbent gradually opens a closed model to external knowledge and contributors, how this creates value, and how a co-existence of internal and external knowledge is possible and profitable.

2.2 Open business model and external knowledge

Studies of user innovation suggest that users can be an engine of innovation, by experiencing needs ahead of the market, which then become commercial products (e.g., von Hippel, 1986). The related perspective on open innovation takes the point of view of organizations to show that companies can be better off if they insource external knowledge and license their internal knowledge to external actors (e.g., Chesbrough and Rosenbloom, 2002; Chesbrough, 2003). Scholars within these two traditions have examined how firms engage with communities of users (e.g., Jeppesen and Frederiksen, 2006), what are the motivation within these communities (e.g., Shah, 2006), and what are the conflicting logic and between closed and opened model of innovation (e.g., Sauermann and Stephan, 2013).

In this paper we borrow concepts from the user and open innovation literatures to tackle our different problem. Our focus is on how companies adapt to technological and market changes from a business model standpoint, that is how companies redesign their value creation and capture strategies to respond to changes that undermine their profitability. The use of communities of users which collaboratively innovate is a way through which organizations can redefine their value creation strategy. Afuah and Tucci (2012) argued that the recourse to crowd is a way through which firms solve their distant search problems. Jeppesen and Lakhani (2010) shows that companies outsource specific tasks to the crowd through contests. We will be concerned with how incumbents utilize external knowledge and

contributors to effectively adapt to changes. Moreover, our attention extends beyond the study of innovation, which is the main focus of the user and open innovation literatures. Companies also refer to external actors for production tasks, to reduce their costs and exploit valuable competences outside their boundaries. Therefore, instead of utilizing the terms “user and open innovation” we refer to “open business model” (see also Chesbrough, 2013).

We hope to advance our understanding of the process of business model innovation, by considering how companies open their boundaries to external knowledge while preserving their core activities and closed model. There are benefits and costs when transforming an existing value creation and capture strategy toward a more open approach. Laursen and Salter (2006) pointed out a paradox of openness: openness and value appropriation are opposite strategies. Hoang and Rothaermel (2010) showed that firms can better leverage their external exploitation experience when they also have internal exploration competences. Fey and Birkinshaw (2005) examined some governance modes through which firms incorporate external R&D knowledge, such as university partnering, alliances, and contracting. The challenge to open to external knowledge is likely to be higher for companies that need to preserve their professionalism and their identity, and our paper also tries to speak to such case.

3. Method

This is a longitudinal single-case study deconstructing the evolution of a traditional newspaper publisher from a closed model of journalism to a more open business model. Our approach responds to scholars’ calls for using storytelling to build better theories (e.g., Gibb Dyer and Wilkins, 1991; Pollock and Bono, 2013). We detailed the transformation of a company after a technological change, by contextualizing its decisions and actions within its changing

environment. At the same time, we examined specific projects that were launched by the company to implement the change (e.g., Burgelman, 1983; Pettigrew, 1979).

3.1 Research setting and case selection

The choice of studying the newspaper industry fits with our research question. First, in this industry the technological change of the Internet has diminished the efficacy of publishers' existing business models, which needed to be partially reinvented (e.g., The Economist, 2011; Seamans and Zhu, 2014). Thus, this context allows to analyze a process of business model innovation. Second, traditional publishing companies have a closed and hierarchical way of being organized, while the web has favored open and participatory journalism (OECD, 2007). Thus, we it is possible to study how traditional organizations respond to a surge in external knowledge production. Third, the revenues that newspapers globally get from their printed business still exceed the ones coming from the web, after 20 years of digital revolution (e.g., PEW, 2013; Gilbert, 2006). This suggests that the setting is also ideal to study how to companies simultaneously balance old and new ways of creating and capturing value.

Regarding the specific research site, we selected the largest Italian newspaper publisher, Gruppo Editoriale L'Espresso (GELE), for several reasons. First, the company's financial performance was superior to its competitors, thus offering an opportunity to learn from the best-in-class. Second, GELE has been among the world's fastest media to adopt digital technologies, and at the same time one of the most innovative in its offline business, thus revealing an ability to balance old and new ways of creating value. Third, its main newspaper, "la Repubblica", has strong ties and constant relationships with the other important foreign newspapers, such as The New York Times, Le Monde, The Guardian, El Pais, and DieWelt, thus limiting concerns about country specificity. Forth and very importantly, the publishers

launched a series of projects that gradually opened its business model - starting since 1997 - so that there were precise experiments that we could analyze.

3.2 Data collection

Our rich data collection covers the period from 1995 to 2014. We gain access to all types of company reports, business plans, financial records, and personnel from all functions and hierarchical levels. We started gathering data in 2012 and continued till the end of 2014. Three main sources of data were used and triangulated to improve the accuracy and understanding of the observed process (e.g., Jick, 1979). Our primary source were company interviews. We conducted 46 face-to-face interviews, 38 of which with GELE's personnel and 8 with four external companies (see Table 1). At GELE our interviews ranged from the presidents and CEOs of the corporate and its subsidiaries to executives from plants and the digital divisions, journalists and managing editors. They were conducted in different company's locations around Italy and in the US, lasted on average 1.5-2 hours, and were taped, transcribed, and content analyzed. Through our open-ended questions we tried to understand whether and how the company launched digital businesses aimed at exploiting the contribution of external organizations and citizens (later codified as example of "open business model"). We also asked about the company's traditional printed business, to assess that it was not abandoned and to understand its characteristics and synergies/interferences with the new digital businesses. In fact our research refers to situations in which a firm develop more open forms of value creation without dismissing the successful elements of its traditional business, characterized by professionalism and internal knowledge production (codified as "closed business model"). To mitigate concerns with retrospective biases (e.g., Huber and Power, 1985), the questions about each project were asked to different informants to check the accuracy of each statement (Glaser and Strauss, 1965).

As a secondary source we used archival data. We consulted company's annual reports from 1995 to 2014, periodic internal reports and ad-hoc business plans, press releases, investment banking reports, national and international books on the history of the organization and on media in general, and newspapers' coverage of the company. Such an extensive effort of documentation was needed to carefully understand the transformation of the company's business model that was operating in a period of high uncertainty and environmental turbulence. When a project in the domain of open business model was identified, typically during interviews, then we dug deeper into it by consulting reports and business plans related to the initiative. For example, when in 1999 a project enabling school journalism was launched by GELE, we collected evidences from books, releases, articles, and so on.

A third effort of data collection referred to switching the locus of observation to the external environment. As said, we wanted to study how an incumbent reacts to a discontinuity that, by transforming a market in terms of radically new products and new entrants, also affects existing business model. Therefore, to contextualize our company's strategic decisions and reactions we needed to examine how the external market evolved. We collected and analyzed all public documentations produced, since 1990, by industry federations, authorities, and the antitrust (e.g., FIEG, AGCOM, AGCM). To fully understand the new competitive landscape, we also run 8 interviews with four new entrants whose business was entirely based on the exploitation of User-Generated-Content (UGC), blogging networks and citizen journalism (in the paper we dedicated a subsequent paragraph to them).

*****Insert Table 1 about here*****

3.3 Data analysis

We started by identifying and categorizing the new projects launched by GELE, in terms of their degree of openness or closeness. Informants were typically able to make the distinctions

regarding this specific categorization. However, we also used a formal coding procedure on the text of the interviews and documents. To guide the coding, we drew on the user and open innovation literature since scholars in these traditions already examined the attributes of openness and closeness. According to the existing literature, innovation can also originate at the *external*, can be initiated by *users*, be supported by *enabling* tools or *platforms*, be driven by *intrinsic motivations*, be characterized by *lower costs*, be *open*, and can result from *collective efforts* and a *distributed* control (e.g., von Hippel, 1986; von Hippel and von Krogh, 2003; Chesbrough, 2003; Jeppesen and Frederiksen, 2006; Afuah and Tucci, 2012). Vice versa, the literature uses opposite attributes when it refers to the more traditional model of innovation: *internal*, made by *professionals*, possible due to *specialized and costly assets*, sustained by *extrinsic motivations*, very *costly*, characterized by a *closed* approach to development and commercialization, resulting from the *effort of few* and *hierarchically controlled* by a company. The procedure of coding consisted of counting, for each new project, the number of different attributes that entered in the sphere of open versus closed model. For instance, continuing with the school project example, we assigned a frequency count of 8 attributes of openness out of 9 (the *control* was partially maintained by GELE), and therefore the initiative was categorized as employing a very open business model. We positioned all projects on a continuum between closed and open models. To provide another example, an important JV that GELE formed with the Huffington Post in 2013 was classified in the middle between a closed and an open project, because the resulting venture was partially managed by a journalistic hierarchy and the level of external delegation was limited, despite the engagement of 1,000 external bloggers.

The second important activity in our data analysis phase was the extrapolation of information, for each project, on specific common dimensions. We wanted to know whether a

project had success and how it was implemented, because these data could inform our theoretical understanding of how organizations effectively innovates their business models. The assessment of success was based on informants' judgment (following Brown and Eisenhardt, 1997), but also on data evidences and the comparison with competitors. Despite the projects were difficult to be quantified, for each of them we were able to qualitatively gather information about: *success or failure; support/investment by the company; degree of autonomy; proximity with the core know-how of the organization; degree of openness; presence of entrants in the segment.*

4. Findings

We first provide a brief overview of the company history. Immediately after we turn to describe how the company adapted to changes from print to digital businesses, by focusing not on the technological aspect of the transition (for excellent studies on similar issues in this industry see Gilbert, 2005; 2006), but on how to rebuild a business model after a discontinuity. Therefore, we illustrate the open projects launched by the company to exploit external knowledge and to find new forms of value creation. Figure 1 represents these projects, placed on a longitudinal time horizon. Table 2 illustrates the selected key dimension of the projects. To contextualize the strategic decisions of the focal company within its environment, we also provide information regarding entrants exploiting UGCs and open forms of journalism.

*****Insert Figure 1 about here*****

*****Insert Table 2 about here*****

4.1 Brief history of GELE (period: 1955-1995)

GELE is the largest Italian newspaper publisher, editing 1 leading national newspaper (*la Repubblica*) and 18 local newspapers. The company also operates in other media sectors such as magazines, printing production, radio, TV, advertising, and several digital businesses. In 2014 its total revenues amounted to euro 712 mln, with 2,400 employees. The concentration of all these activities is the result of a series of ventures, mergers and acquisitions that started in the 1970's. In 1955 an initial company was created to publish the magazine *L'Espresso*, which became immediately famous for its investigative reports. In 1976 the journalist Eugenio Scalfari founded the newspaper *La Repubblica*; in only three years the publication filled the circulation gap with "Corriere della Sera", the other leading national newspaper read by the Italian intelligentsia (owned by RCS Media Group). With an extraordinary effort in quality journalism, journalistic inquiries, and liberal ideas (like The Guardian, Le Monde, El Pais, and The New York Times), *la Repubblica* rapidly attracted audiences and received funds by the publisher of *L'Espresso*. In the 1970's the publisher also started a sequel of acquisitions of local newspapers, identified among the oldest and most successful publications in each territory. In the 1980's, two major national radio were added to the growing media company, Radio Capital and Radio DJ. In 1991 *L'Espresso* and *la Repubblica* were merged in a unique company, GELE, whose major shareholder became (and still is) the famous Italian entrepreneur Carlo De Benedetti. The company also started publishing periodicals such as MicroMega (politics), Limes (geopolitics), Le Scienze (science), and the National Geographic Italy (nature).

4.2 First projects and external Knowledge (period: 1995 – 2001)

Since 1995 GELE invested in digital activities. As a pioneer, *La Repubblica* moved its initial steps on the web in 1996 to cover the national political elections in real-time, concomitantly

with a similar experiment done by the Washington Post for the US Presidential elections. The surprising engagement of people convinced GELE's management to allocate resources to three internal journalists, that in 1997 launched *repubblica.it* and then created the first dedicated online newsroom. At that time, and at least till 1999, most of newspapers simply posted their pdf replica on the web. For example, Corriere della Sera waited till 2001 to start producing content exclusively conceived for the web. The higher digital effort of GELE was supported by Kataweb, a separate technology subsidiary founded by the company to develop digital assets and competences for all its newspapers.

Since its inception, *repubblica.it* actively engaged with users. In 1998 the website experimented its first "live chat with readers" to collect their opinions and ideas on what the ongoing national education reform by the Minister Berlinguer should include. The engagement with audiences was also enriched by the creation of forums and blogs. In 1999 Kataweb launched one of the first Internet portals, *kataweb.it*, and immediately started offering innovative services to users (e.g., email, blogging tools, VoIP). The innovation and development deputy director explained: "We introduced a number of innovations largely ahead our time. The company was the opposite of myopic. We experimented with socials and online videos when the speed of Internet connectivity was too slow, and the interactions with citizens were not even conceived".

Blogs. Kataweb created tools for content production for citizens in 1999, largely before Blogger (2001) and WordPress (2003). In addition to enabling external users for content production, the company also allowed its journalists to own their blogs on GELE's properties (*repubblica.it*, *kataweb.it*, *espresso.it*, and *quotidiani.gelocal.it*). The most digital-sensitive journalists started blogging in 1999. Examples are the blogs *Zetavu*, *Estremo Occidente*, *Cablogrammi*, or *Giornalismo d'altri*. These blogs, still active in 2014, were spontaneously

created by journalists to express their voice beyond the constraints posed by more classical articles.

School project. A second substantial experiment opened the company to external contributors. It was the implementation of a prototypes originally developed at the MIT. In 1994 GELE became member of a consortium of international publishers called “News in the Future”, coordinated by the MIT’s Media Lab. The company’s digital strategist and founder of *repubblica.it* said: “Our participation share into the consortium was significant, of around 100 thousand dollars. We were the only Italian publisher sending people to Boston. I can remember that there were 3-4 newspapers from Europe and the rest from the U.S. By interacting with the team of the Media Lab, and with its president and media guru Nicholas Negroponte, we imported in Italy a series of inventions that we transformed in real projects!”. For example, one of their prototypes was a tool called “SilverStringer”, which aimed to make it simple production and publishing of digital content by elders. GELE transformed and redesigned the SilverStringer platform in a school newspaper platform. A journalist and former director at GELE said: “In 2000 we hosted in our offices in Rome the co-inventor of SilverStringer, a Finnish PhD student working at the time at the MIT. We wanted to modify the software to make a platform that allowed all schools to create their own digital newspaper. This gave rise to a big project with Italian schools, initially called *La Fragola*”. The initiative was so successful that in 2004 it was acknowledged in the famous book on participatory journalism, “We the Media” by Dan Gillmor (2004: 143): “By far the biggest installation is operated by the La Repubblica newspaper in Italy; its “Kataweb” online affiliate uses SilverStringer to help publish some 4,200 online school newspapers”. The project became a stable reality for GELE and after 14 years since its launch, was still active in 2014 under the new name of *Repubblica@scuola*. We found that the project represents for the company a

new way to have a conversation with students and professors, by enabling them to create their own school newspaper and by awarding the best one at the end of each year. The general manager of the digital division of GELE explained how the project is run: “*Repubblica@scuola* is under the radar of our newsroom, from which it has always received great support. For a pure profitability standpoint it is now a cost, but we also look at the project as a service to the country and a way through which we develop new competences and engage with a huge number of schools. For example, now we are working with Microsoft for a plug-in tool to be inserted on our platform to allow students generating crowdsourced lecture notes! We also believe that our privileged relationship with schools will offer us an edge over competitors to launch profitable businesses related to online education”.

Personalized news. Another experiment started again after the company saw a technological prototype of the Media Lab, “Fishwrap”. A group of MIT scholars in 1995 published a paper titled “The Fishwrap personalized news system”, in which they presented an embryo system to receive feeds by citizen about local news (Chesnais, Mucklo, and Sheena, 1995). As for the other prototypes developed by the News in the Future consortium, also this one needed to be implemented by the interested publishers. GELE immediately realized the importance of the project, but encountered problems in transforming it in a functioning activity. The reason of the failure is quite evocative. As the GELE multimedia strategists explained: “In 1997 we decided to implement a news feed system since we foresaw that large part of the value in information derives from local news and personalization. Technically we were assisted by Microsoft, but the partnership was the problem! The culture at the MIT was about open source, but we proceeded in the traditional way by forming a strict and costly relationship with Microsoft. This impeded the necessary experimentations to transform the Fishwrap prototype in a real business. This first experiment of a personalized newspaper

failed, and even when my colleagues later tried to coordinate other European newspapers to offer more content on Microsoft Window 97, it failed again. I can tell you that in our group there were formidable people that knew how to approach the problem; however the dominant culture in publishing companies is too close and the management allowed us to only experiment in the old way: traditional publishers are like the Angel of Benjamin!". On a similar point has also returned the other pioneering journalist visiting Boston in that years. He told us: "Almost 5 year before Facebook was invented, Kataweb had already created the first social network! There are books and evidences testifying this, exactly like for the cases of *La Fragola*. We built a system through which users could create a profile, comment and interact among them, and see what other users valued the most - essentially it was Facebook! However, for a project like this you need financial resources and delegation. But in a company with a powerful and rich business like *la Repubblica* everything get easily cannibalized, if they do not recognize the benefit".

4.3 Return to traditional business (period: 2001 – 2005)

The fate of majority of newspapers worldwide was signed by a negative event in 2001: the burst of the dot.com bubble. After the initial period of enthusiasm with the Internet, during which many large publishers invested in digital ventures (see also Gilbert, 2005), a period of divestiture started when the stock market for digital activities collapsed. This was also the case of GELE, the publishers that most than any other in Italy had invested in online ventures (as noticed, its competitors Corriere della Sera invested only much later). The director of the digital division noted: "Kataweb tried the quotation at the Italian stock exchange, but the market went down two weeks before the expected lunch. The CEO of the time missed the opportunity to transform our Internet company in a tech giant! Once this window of opportunity was lost, Kataweb started accumulating huge losses, due to the depreciation of all

activities related to the “new economy”, and hundreds of our employees were either reallocated or fired”. From that moment on, the company stopped investing additional resources on the web, and exited markets like VoIP services and e-commerce businesses. We could not find any significant new digital project launched from 2001 to 2005. This period of the analysis was characterized by a continuation of the existing and more consolidated online businesses, with only incremental improvements that brought to the consolidation of *repubblica.it* as the leader of online content and audiences. Interestingly enough, in this period GELE oriented its investments and innovations towards the old printed business. Indeed, the company was the first in Italy to introduce full-color printing presses. The director of plant technologies, Giuseppe Pompameo, explained that the group invested 150 million since 2002 to substitute its 10 old flexographic presses with new ones, bought by Cerutti Group, and which permit to print in full color. That strategy allowed GELE to create and capture more value for advertisers, since competitors kept offering black-and-white printed ads at least till 2006.

4.4 Entrants exploiting external knowledge

The parenthesis that we open here aims to illustrate the context in which the focal company was competing. By 2006 all Italian newspapers had a significant presence on the web, and many other independent news websites had also emerged, often created by ex-journalists. However, being profitable in the digital space is an extremely difficult task for a content producers, given the almost infinite competition (e.g., AGCOM, 2014; PEW, 2013). The possibility of content production itself has changed, to the extent that any actor can produce content. The democratization of the Internet, started with forum and blogs and evolved to social networks and video recorded through smartphones, has determined the phenomenon of the UGCs or user generated content (OECD, 2007). Interestingly enough, new companies

entered the market to exploit such a spontaneous rise of users' participation. In Italy this happened especially since 2004-2005, when the UGC phenomenon reached a significant dimension. This type of entrants turned out to be quite economically successful, thanks to their new business model that creates values by exploiting huge masses of free contributors.

Four major companies emerged in the domain of participatory journalism and open content production. They exclusively based their activities on citizens and external collaborators, rather than on professional journalists. In the temporal order of market entry, they were: Populis, Banzai, YouReporter, and CityNews. The first company to be launched was "Populis", founded in 2004. The organization today has a global presence, and its model consists in aggregating and enabling blogs and citizens, whose content are then associated to advertisements to make profits. Some of the websites through which Populis operates are: Bloggo, Blogosphere, Nanopublishing, Excite. Its co-founder and Chairman summarized: "We are able to attract and aggregate a very large part of the blogosphere that exists in each of the countries where we operate: Italy, UK, Spain, France, Germany, Brasil, etc. In some occasion we also communicate to the crowd what specific content we are interested in, and then pay only the content that fits more with our request. Our platforms *bloggo.it* aggregates more than 800 Italian blogs, and the coordination of the produced content is done by a famous and traditional journalist that we hired to guarantee an overall quality".

The second Italian company to be launched was "Banzai". The organization, created in 2006, has based its business on high quality bloggers and vertical websites whose content are created by selected citizens. Today it owns several important web properties, and it represents the third largest digital media group in Italy, just behind the two larger Italian publishers: GELE and RCS Media Group. Its founder and CEO, a serial digital entrepreneur told us: "Some of our properties, like *studenti.it* or *giallozafferano.it*, are the most visited websites in

Italy in their respective segments of cooking and education. *Studenti.it* is made exclusively by students themselves, and a community of people sharing some learning interests. *Giallo Zafferano* is instead made by one food-passionate woman who excellently explains her receipts through online videos. She is not a professional cooker, neither a journalist! Another successful website that we own is *ilpost.it*, founded and directed since 2010 by a journalist, and which evolved by his previous personal blog created in 2001. *Il Post* is really a mix of selected blogs and traditional editorial content managed by a small internal team of young guys”. In his foundational article in April 2010 it is stated: “Today *Il Post* goes online. [] It is half aggregator and half editor of blogs. It has a newsroom that publishes news, stories and information that are collected from other media and the web, always linking and acknowledging the sources. And it has a family of blogs, whose authors are different in qualities and competences” (Il Post, 2010).

The third successful company in this domain is “YouReporter”. Its product is a website that permits amateur video journalism by citizens. People publish on YouReporter videos of interesting events that they witnessed, and which were simply recorded through their mobile devices. Such a citizen journalism platform was founded in 2008 by a group of three young students and an ex journalist, and it has been acquired in 2014 by RCS MediaGroup, the competitor of GELE. One of its co-founder and former CTO stated: “We are the only Italian company in the video-news segment that rely exclusively on citizens for video content production. People send us their video about heartquakes or storms or whatever happens in their local environment. They want these information to be known, and they also like to be appreciated by their friends. It is frequent that our content end up being on air on major TV stations, such as RAI or Mediaset, which can use them if they display the logo of YouReporter on the videos. Probably citizens chose to send to us also because we were an independent

company, and the reference point for crowdsourcing the video news. Many mass media have tried to imitate us, like RAI, Sky TG24, and La Repubblica, but we are the undisputed leader in the segment of video citizen journalism”.

The forth and more recent experiment in the area of citizen journalism was “CityNews”, founded in 2010 by the founder also of *student.it*. CityNews represents a network of now 40 online news websites. It is the first and most audacious experiment aimed to use normal citizens to create local news for each Italian city, at the neighborhood level. Examples of the websites belonging to the network are: *MilanoToday* or *RomaToday*. To a certain extent, the experiment occupies the same product category of the 18 local newspapers owned by GELE. The profound difference is that GELE’s local newspapers are hundreds years old publications, deeply rooted in their territories and memories of communities, are not simply focused on the local news section, and more importantly are made by professional journalists that guarantee deeper and usually more reliable news. Despite GELE’s big advantages, the rapid growth of the CityNews’ network and the active participation by younger communities to content production cannot be underestimated. In a recent interview with the specialized media magazine *Prima Comunicazione*, its CEO and founder declared: “Some of our CityNews’ website are now first for online audience at the level of cities. In cases like *RomaToday*, they have reached a penetration of 50%, which is larger than most of traditional local newspapers in the region” (*Prima Comunicazione*, 2013).

4.5 Collapse of the Old Business Model

Another phenomenon to be taken into account to understand the transformation of the focal company is the collapse of traditional newspapers’ business model. The profitability of this industry has been declining, at least since 2004-2005, in almost all countries. The increase in competition caused by the digitalization and the profound changes in the offer of content and

ad spaces have drastically undermined publishers' ability to create and capture value. In Italy, offline advertising revenues plummeted 41% between 2000 and 2012 (FIEG, 2001; FIEG, 2013), while the new online ad revenues are still very small. Also offline reader revenues declined, due to a decline in the number of copies sold by 33% during the same period (Audipress, 2012). The President of the Italian Federation for Newspaper Publishers (FIEG), said in his 2014 annual meeting with publishers: "The reasons behind the crisis of news publishing companies are beyond the simple economic crisis started in 2007. The business model of newspapers needs to be reconceived. Revenues from ads are drastically going down, and revenues from offline readers are declining too, despite less due to increases in the price of printed copies". In this unfavorable market condition, GELE was able to perform better than its direct competitors, but its balance sheets were not exempt from the digital impact. The president explained: "Facing a structural decline in the business model, our company has taken several initiatives that have permitted us to resist better than our competitors. Our CEO has rationalized and made important saving in our cost structure, starting by cutting some printing plants and also reducing, where needed, the number of employees and journalists proximate to retirement. We launched many new initiatives to create new businesses, by acquiring companies or internally developing them. We are also including more external contributors in our businesses, conscious of what means to operate on the open web".

4.6 Opening the Business Model (period: 2005 – 2014)

GELE confronted itself with the illustrated changing environment in which four new companies entered the market by adopting open business models, while the old model of newspaper publishing has showed its economic unsustainability. However, the company was well positioned to explore opportunities of business model innovation associated to the incorporation of external knowledge, due to its past experiences with content crowdsourcing

initiatives since the inception of the web. In a 2014 public speaking the executive editor of La Repubblica stated: “With the advent of the Internet, the era of journalism based on vertical communication from a pulpit has definitely ended. The sermon does not exist anymore! It is important to realize that we now navigate in a sea where everybody needs to have a space and no privileged position are recognized, to none”.

By 2005 traditional publishers had recouped from the losses and fears caused by the Internet bubble, and GELE restarted its digital experimentations. From 2005 to 2014 the company launched several new digital projects, some outside its core business of news publishing and some within it. An example of the first case is *ilmiolibro.it*, a venture in the business of books, while an example for the second case is *reporter.repubblica.it*, a platform operating in the core business of news. Moreover, many projects launched in this period tended to be based on users and external collaborators for making a business. They were characterized by most of the attributes previously mentioned, such as external knowledge, users participation, platforms, intrinsic motivations, lower costs, collective efforts, and so on.

Book self-publishing. In 2005 GELE was among the first newspaper companies worldwide to successfully experiment with the phenomenon of self-publishing. Lorenzo Fabbri, the head of digital entertainment at GELE, acted as a real entrepreneur from within the company to create the digital venture *ilmiolibro.it* (in English, mybook). The platform was founded to allow everyone to publish its own book; today it is profitable and represents the larger reality in Italy in the domain of book self-publishing. Through its website it offers over 30.000 titles and reach a community of more than 300.000 active members. *Ilmiolibro.it* reflects the idea that anybody can be an author and there is no need for the disintermediation of a traditional book publisher. Lorenzo explained us: “The system works that people publish their books on our platform, and at the same time they judge the quality of the publications of other authors.

In this way, if your book likes to many readers, you can opt for directly selling it through our platform. You can also use the printing presses of GELE to print hard copies of your book, for you or for the marketplace. Before our platform, both of the two possibilities were negated to common people. Not only we democratized book publishing, but also allowed more talented writers to publish and sell their books through an external traditional bookstore. This happens when a book on *ilmiolibro.it* appeared to be particularly good for our online community, and in this case we put the author in contact with the major traditional Italian book publisher, Feltrinelli, to sell the book through its large physical chain”. It is important to stress the aspect that GELE did not operate in traditional book publishing. Interestingly enough, traditional Italian book publishers such as Mondadori, RCS Libri, or Feltrinelli did not undertake similar initiatives, or did it very late (e.g., Scrivo.me, launched by Mondadori in 2014). The real competitors of *ilmiolibro.it* were found to be Amazon Kdp or Kindle Direct Publishing, the US platform Smashwords, and the startup Narcissus (all founded after 2008). The GM of the digital division of GELE explained how the structure and way the company dealt with these projects: “*Ilmiolibro.it* has never been in the public eye of the company, in the sense that we knew about it and supported it, but its founder was left to operate with great autonomy, using his small budget, and managing his own team. The autonomy probably explains part of the success. Instead, the case of *Repubblica@Scuola* is quite different. La Repubblica’s newsroom wanted to support this project, which therefore has always been operated in the public eye of the company. At the end it is equally successful, despite for this project we just look at the high engagement with the school community rather than at making revenues”.

Crowd journalism. The website *repubblica.it* and *espresso.it*, and the other GELE’s digital properties of the 18 local newspapers all have seen increasing in the years the participation of their readers. For all these traditional publications, the concept of “opening” has to be

interpreted as the addition of pieces of external knowledge joining the flow of information produced by company's professionals. The offline and online newsrooms of these newspapers are still fully dedicated to produce the bulk of the editorial news, whose accuracy, coverage, and credibility preserve the historical brands and the relationship with readers. However, the inclusion of external knowledge gradually augmented. It ranged from simply receiving photos and information by citizens to the adoption of tools to systematically engage with communities. The innovation and development deputy director said: "During the earthquake at L'Aquila in 2009 our local newspaper *ilcentro.it* decided to dedicate a memorial to the deceased people, more than 300 individuals. The newspaper posted online just a list of the names of them, and asked readers to send photos and information about these individuals, thus offering an journalistic service that would have been otherwise impossible". An example of adoption of a tool to systematize the relationship with users was provided by *laprovinciapavese.gelocal.it*, another GELE's local newspaper. A project manager and information architect explained: "La Provincia Pavese was the first in Italy in 2011 to use the crowdsourcing tool Ushaidi, a software created in Kenia after the 2007 political elections to geospatially report information about critical events". In a 2011 post on the blog "Giornalismo D'Altri", a GELE's journalist wrote: "Ushaidi was born to manage information about urgencies, but it can be employed by newspapers. La Provincia Pavese is experimenting with it through a call to its readers, "Racconta Pavia", in which the newspaper asks to notify what does not work in the city in terms of parks, streets, garbage, and by locating the information on a 'crowdmap'. The newsroom coordinates all citizens' contributions".

GELE made an important experiment about participatory journalism by the end of 2010, launching *Reporter*, the first citizen journalism project ever done by a traditional media company in Italy. The venture, which is also linked to the homepage of *repubblica.it* under the

domain of *repubblica.reporter.it*, aims to collect journalistic videos or services produced by amateurs video makers with an interest about news. The company's project is different from YouReporter, the independent video crowdsourcing platform fully open to citizen and without any filter in terms of content screening and assessment. GELE conceived its platform as an high-quality service through which people could send also investigative pieces of video journalism, and a part of the newsroom assess them. To govern the process and strengthen the relationship with the more talented reporters, the company has also created an "Academy". The mechanism works as follows. A crowd is invited to make and share videos that are interesting from a journalistic standpoint, and the best video maker is awarded through a training within the Academy: a series of lessons with the film director Paolo Sorrentino and with La Repubblica's journalists. The objective of the project is to also establishing a more enduring relationship with an external community of potentially viable reporters. One of the selected video makers, Francesco from Torino, declared that he participated to the project: "To have the occasion to confront myself with professional directors and learn from them. By the end of the training period I wish to collaborate with La Repubblica to realize a significant investigative report". However, the journalist that founded *Reporter* told us about a peculiar problem that the website encountered at the moment of its launch, in 2011: "Something unexpected happened. The day when *reporter.repubblica.it* went public online we received negative comments by bloggers. The main complaint was that we declared in the regulation that we would have paid citizens 150 euro per video. This was seen as a small amount for a publisher like us, and we were accused to take advantage of contributors. Now, if you think that people normally share their content for free on YouTube or Facebook, you can see that the reaction was quite unpredictable". Unfortunately, the project never became particularly successful for GELE. A number of citizens got engaged in this challenging program, but the

profitability and size of contributions remained negligible for the dimension of the company, and neither seemed to be a priority for the management. The GM of the digital division of GELE stated: “We did not pushed a lot this project given its complexity. Moreover, there were not international example that could encourage our earlier experimentations. Finally, we wanted to allocate resources to projects with a prospectively higher profitability”. One of the few international comparisons is the CNN’s *iReport* project, a video citizen journalism platform. We talked to a journalist from *ireport.cnn.com* in Atlanta, which was in charge of the coordination of citizens: “We have created a system of incentive such that people are eager to contribute. We do not pay them, but allow the best video to go on air on CNN! Only after this result is achieved the individual gets paid. Many good video sent by people have gone on air during one of our TV programs”. The GELE’s management, however, told us that also the CNN project is a profit loss initiative, not very useful for the sustainability of the company. A separate comment by Federico Badaloni, the information architect of GELE, might help sheds clarity on the difficulties of these citizen journalism projects by traditional media: “People voluntarily give information when you can protect and somehow reciprocate them. You acquire the right by showing that you listen to them. The key is to build trust in the relationship. A real participation is possible when you are able to establish a dialog with contributors”.

Joint Venture with the Huffington Post. In 2012 GELE made an unexpected move in the quite static world of traditional publishing. The company formed a joint venture with the US company The Huffington Post Media Group (in the following, HPMG) to launch the Italian branch of the website: *huffingtonpost.it*. The JV was the result of a negotiation among the president and the CEO of GELE, and the president and editor-in-chief of the Huffington Post US, Arianna Huffington. The agreement consisted in a 49% of ownership by GELE, and a

51% by the American company. The CEO of GELE's Italian branch of the Huffington Post explained: "The purpose of this alliance was threefold. The mixed model that Arianna has created, which balance bottom-up bloggers' contributions with fewer top-down journalistic content is interesting from a business model perspective. We are also exploring the opportunities of similar 'low cost - high participations' models. And the HuffPost represents a successful case of mixing crowdsourcing – through blogs and syndication - with quality. Second, we wanted to access to a more advanced digital platform of content management. Third, an American and digital native partner could directly expose us to most recent technological advancements".

The Huffington Post is internationally known for its ability to collect a large number of interesting daily contributions by famous non-journalist individuals, from the U2 front man Bono to the British ex-prime minister Gordon Brown, all acting as bloggers for the website and bringing on it their followers. The website is also an aggregator of content by external news sources, among which the New York Times, BBC, and TIME. We talked to the international executive editor of Huffington Post US, Nicholas Sabloff, to understand how the global website is managed: "The secret of our model is viral-plus-journalism. The web for us is an open media, and we have interpreted that by giving voice to people. We create communities and favor conversations. Even if you go on our recent HuffPost Live, our TV streaming service, you'll find the same logic but on video rather than through blogs. We invite interesting people to participate in a conversation, and they are happy to get a global visibility". Then we interviewed the general manager for international business about the growth moves of HPMG: "In terms of geographical expansion, we enter new countries by allying with strong national newspapers. In terms of new verticals, we follow the mood of people on the web, and have created sections exclusively dedicated to weddings, latinos, or

gay voices, that we call communities. Finally, to cover more complex topics we form alliances with specific foundations and let them contributing with their expertise. An example is the collaboration with the prestigious Berggruen Institute of Governance to fuel our international section, *The WorldPost*". The quotes shows how the exploitation of external knowledge can be sophisticated, ranging from simple users to prestigious foundations depending on the quality task.

An interesting aspect about how the Italian website, *huffingtonpost.it*, is managed is that GELE assigned the role of executive editor to a very respected journalist coming from print and TV. In an interview with the media magazine *Prima Comunicazione* she said: "When I was contacted by GELE president to manage the Italian HuffPost, I asked myself: Why? What was clear to me was that I had the chance to make something very different in Italy, and to create a large digital news website that accepts all perspectives, instead of just one editorial line". The vice managing editor of the Italian venture illustrated how the online content are structured and what is the underlining business model: "If you go on our homepage, you see three session. On the left side you find the featured blogs, written by actors, medical doctors, labor union representatives, and so on. The central part of the page is instead composed of the hard news, and this is where our small newsroom dedicates its effort of interviews and analyses. This central part makes us more similar to a newspaper. The right side is more for relax and fun, with pictures and topics highly shared on the web – where we aggregate external links. A similar division of the homepage is in the US version and in the other local edition like in Spain, France, Japan, and so on. So the 2/3 of HuffPost content come from external bloggers and other websites. However, a difference compared to the US model is that we pay the single contribution of our bloggers, because we operate under the Italian regulation and wanted to be respectful of people's work". The social media editor of the Italian JV added

other two aspects that characterize the open nature of the HuffPost and how works is done: “The social media function is centralized, as I act as the social media strategist for all external platforms where we have an account - Facebook, Twitter, and so on. By using an advanced social media dashboard, I constantly monitor the traffic of our pieces, also using Google to boost it, and I can maintain our Facebook page updated with a new post any 2 minutes. This shows how open we are to social sharing, and the attention we give to go viral. As opposed to a traditional newsrooms, for example, we don’t have the distinction between the graphic designer and the journalist. In the online newsroom of a traditional publisher there are graphic designers, journalists, and assemblers of content, each executing a specific task; at the HuffPost each journalist has all tools to do everything, from writing to cutting and editing a piece together with pictures. This also reduces costs”.

Specialized online community. In 2013 GELE acquired the 51% of the company owning *Mymovies.it*, the leading Italian online community about movies. The website was born in 2000 and by 2003 it reached an average of 3 million unique users per month, who consult a database of films that resulted from the contributions of people and the active coordination of specialized personnel. The GM of the digital division of GELE explained: “Mymovies can be interpreted within the set of initiatives of participatory content production, since each movie is wrapped around by comments of people. However, the real value is in the crowd-selection that it implements! The website has a synthetic index, called “MYmonetro”, that suggests what movies deserve to be seen, based on the comments of hundreds of viewers”. In a press release, GELE referred to the “synergies between Mymovies.it and its newspapers, in particular *repubblica.it* and its website *Tvzap*”. This tells about how the company wants to strengthen its positioning in social video, through an acquisition that complements its internally developed *Tvzap*, a social platform for TV that allows users to elect and follow

their favorite actors. In 2014 the head of digital entertainment at GELE and founder of *ilmiolibro.it* wrote on print: “Internet is changing the world of TV. An example is the platform TvZap and its classifications. []. Social tv is not so much about the devices and channels of fruition of video content but about the idea of Internet as a platform of discussion and interaction with TV programs and its cast” (L’Espresso, 2014).

Video syndication platform. The rise of joint ventures, acquisitions, or internally developed projects exploiting external knowledge further revealed a key aspect. As the head of business and market for free products at GELE specifically said: “The model that we have now is unsustainable in the long-run, and therefore we experiment with new ways”. The manager also added: “For example, a big project that we developed in this 2013 is a video syndication platform that allows newspapers not belonging to our group to share their video with us, and vice versa. We use the content sharing among different newspapers to increase our local coverage and reduce our costs”. Therefore, GELE was not simply found to increase its access to UGCs, but also to open its boundaries to companies that could exchange professional content with the company. The centrality of professionalism was also remarked by the executive director of La Repubblica, in the continuation of one of his 2014 public speaking: “What is still very recognizable is the importance of strong competences. For example, our senior journalist Bernardo Valli is now in Ukraine to follow the crisis of that country, but before he was in the North African countries for the Arab Spring, and previously he was correspondent from war zones and other foreign countries for 50 years. The type of information that individuals of this caliber can generate cannot be confused within the sea of social networks”. Therefore, the balancing of closed and open forms of production requires complex tradeoffs and the capabilities to preserve the existing value while adding new forms of value creation. Regarding this last video syndication project with different publishers, the

GM of the digital division concluded: “The next step for a large company like us is to apply the principles of openness also to larger partners. The reason why our video syndication platform is important is because it enable us to interchange quality videos with other professional content providers, and then share advertising revenues”.

5. Implications and Conclusions

The exploitation of external knowledge, to innovate a company’s business model, is the central argument of the paper. We focused on how organizations open their boundaries to external participants and contributors, after a discontinuous change has undermined their profitability. Our perspective is different but complementary to technological change studies (e.g., Tushman and Anderson, 1986; Henderson and Clark, 1990; Christensen and Bower, 1997; and Tripsas and Gavetti, 2000). Indeed, we do not examine the root causes of incumbent failure (e.g., competence destruction, resources, cognition) but rather we illustrate how firms can innovate their business model. In this respect, the study extends business model literature (e.g., Zott and Amit, 2008; Afuah, 2003; Afuah and Tucci, 2012) by detailing how incumbents can leverage on external knowledge to create and capture value.

Empirically, our longitudinal single-case study (Burgelman, 1983; Pettigrew, 1979; Weick, 1993) details how a traditional newspaper publisher responded to new challenges and opportunities brought about by the Internet. An extreme and revelatory case (Yin, 1994), the Italian media company GELE, was selected for its superior performance and ability to innovate. During the study period, 1995 – 2014, the company launched a number of digital projects that leveraged on citizens participation, crowdsourcing, and third parties’ engagement, while it also maintained its leadership and routines in the traditional newspaper

business. Our grounded theory approach (Glaser and Strauss, 1967), and the comparisons of the projects, permitted to derive theoretically relevant aspects regarding the process of opening firms' boundaries. Table 3 highlights: 1) the use of external knowledge to favor business model innovation; 2) the importance of the distance with the internal knowledge; 3) the role of governance mechanisms; 4) other conditions of success.

--- Insert Table 3 about here ---

5.1 Business model innovation and external knowledge

Our findings show that incumbents open their boundaries to external knowledge not simply to complement their R&D internal efforts (e.g., Hoang and Rothaermel, 2010), but also to innovate their business models. This is more likely when an established company strives for profitability, and entrants create new businesses by exploiting third parties' knowledge. Moreover, incumbents focus more on quality. The proposition can be further examined by scholars interested in business model innovation (e.g., Afuah and Tucci, 2000; Amit and Zott, 2001). In the Italian market, four digital entrants started dominating the open journalism territory after 2004, by basing their businesses on user-generated content, external collaborators, and the crowd. Interestingly, GELE launched its new projects in the same market domains of those entrants. The citizen journalism project "reporter.repubblica.it" occupied the same space of the leading video crowdsourcing platform "YouReporter", which perceived the project as an attack by mainstream media. The difference was that GELE tried to focus more on quality, by incentivizing only the submissions of well executed video investigative pieces, sent by external video makers with which the company tried to establish a relationships to diminish its costs. The other example were CityNews and GELE's 18 local newspapers. While the former started a citizen journalism network in major Italian cities, GELE added components of participatory journalism to its established local publications. For

example, “La Provincia Pavese” was the first newspaper to install a tool for crowd-mapping, Ushahidi, to collect geo-localized news from normal people.

5.2 Distance from the internal core business

Our data suggest that incumbent’ ability to access to external knowledge depends on the distance with the core business. For example, external participants might be less likely to share their contribution with professional companies whose core business coincides with their knowledge. External actors, such as users, have different norms and may not tolerate companies utilizing their knowledge for their professional core business. Therefore, we could expect that companies are more successful when the external knowledge they try to utilize does not overlap with their core business. We observed that GELE had more difficulties with open projects related to its core business (e.g., “reporter.repubblica.it”), while it was very successful with open projects targeting unrelated businesses, such as schools and book self-publishing (“Repubblica@Scuola” and “ilmiolibro.it”). The difficulties with the citizen journalism project was due to the resistance of users and bloggers, a situation that is opposite to the not-invented-here syndrome in organizations (e.g., Katz and Allen, 1982). The success with self-publishing by a newspaper organization was even more interesting if one considers that traditional book publishers failed in similar initiatives. In summary, we could expect that incumbents are more successful when they exploit external knowledge not directly related to their internally produced knowledge. We found evidence of two possible mechanisms to be further examined. Firstly, the fear of self-cannibalization may induce companies to negate support to projects that are too proximate to companies’ core business. For example, the citizen journalism project did not receive support from GELE’s newsroom while the unrelated school project did. Secondly, external contributors can themselves penalize a company when they are asked to give their contribution to professionals in the same core business. For

instance, after the launch of “reporter.repubblica.it”, the community of bloggers and video makers complained against that project, criticizing the option to get paid “only” 50 euro by a newspaper publisher; interestingly similar content are daily posted on YouTube or Facebook for free. Despite we could not claim causality, our results can be of great interest for future research in the knowledge-based view – KBV (Grant, 1996), distant and local search (e.g., Afuah and Tucci, 2012; Katila and Ahuja, 2002), and open innovation (e.g., Baldwin and von Hippel, 2011).

5.3 Partnerships to gain legitimacy

If incumbents have difficulties to access to external knowledge in domains near to their core business, the formation of partnerships with legitimated entrants can mitigate the problem. The evidence suggesting a similar proposition was the fact that GELE became successful in the citizen journalism domain only when it made a partnership with the Huffington Post in 2013. The theoretical mechanism through which a partnership helps incumbents to in-source external knowledge of users is the transfer of legitimacy to operate within the new domains. The U.S. company was highly legitimated to work with users, as it started as an enabler of blogs and aggregators of third-parties content. Our preliminary finding can be relevant to scholars examining how the choice of an appropriate governance modes, such as partnerships, alliances, spin-offs, and so on, helps firms balancing open and closed models (e.g., Fey and Birkinshaw, 2005; Sauermann and Stephan, 2013).

5.4 Entrepreneurship, support, and autonomy.

In order to innovate a business model, an organization needs to employ workers with entrepreneurial skills and give them resources and autonomy. This was observed in the case study when the company launched the successful school project Repubblica@Scuola; the project was initiated by two pioneering journalists, who were left free to explore with the new

prototype “fishwrap”, and was supported by the newsroom and the management. Vice versa, the personalized newspapers’ project, based on the “silverstring” prototype, was implemented with less autonomy, together with Microsoft, and was a failure. GELE’s management approached this latter project with a culture of closeness, by forming a strict partnership with a traditional software company, and this limited experimentation and conflicted with the spirit of open software (e.g., Laursen and Salter, 2006; von Hippel and von Krogh, 2003). The comparison of the causes of success of the two projects reflects previous scholars’ findings about the importance of entrepreneurship, autonomy, and support (e.g., Burgelman, 1983). It also suggests that companies need to embrace all the principles that characterize a new paradigm, such as the closed or open paradigm (Baldwin and von Hippel, 2011), to drive changes in business models.

5.5 Limitations and future research

As it is common with single case studies, typical concerns of generalizability regards also our findings. To avoid the limitations of the single company setting we observed the phenomenon from the company’s perspective and from the entrants’ perspective. Moreover, we relied on extensive archival documentation at the industry level, capturing an entire shift from a closed model of production and distribution to a more opened one. The propositions previously illustrated, despite not formally stated, may represent important anchors for future researches. Scholars can investigate and test the contingencies under which the exploitation of external knowledge helps companies to innovate their business model (e.g., reduced industry profitability; new availability of technologies giving access to knowledge). Researcher can further articulate the mechanisms that impede companies to access to external knowledge, adding or testing the sources of difficulties that we observed in the analysis, either internal (e.g., support by the internal organization) or external ones (e.g., criticism by the same users).

They can also examine what are the long long-term implications of a balance between closed and open business models (e.g., reputations; evolution of the competition). Additional theoretical lenses can also be included, like the organizational identity lens which might suggests that a stronger identity might impede success with open projects. The managing editor of La Repubblica emphasized in one of his 2014 public speeches that Repubblica is a community-newspaper and that its readers have a strong sense of belonging, identifying themselves with their specific editorial ideas. Another important direction for future research is to study how firms make sure that they absorb the external knowledge without importing their associated errors (e.g., internal fact checking, in the case of crowdsourced news). And related to that, what characterizes a firms' absorptive capacity (Cohen and Levinthal, 1990) that fits with distributed and disperse external knowledge? Finally, we did not explicitly consider the value appropriation problem of incumbents. When opening their boundaries, companies have to design value capture strategies that are coherent with the level of reciprocity and trust that similar open models require. Our focus was mainly on value creation through external knowledge, but researches on value capture under similar conditions are more than welcome.

5.6 Conclusions

The study offered new insights on the overlooked problem of how companies innovate their business model to respond to radical changes. We blended three different theoretical perspectives: technological changes (e.g., Tushman and Anderson, 1986), knowledge and firm boundaries (e.g., Afuah and Tucci, 2012), and open and user innovation (e.g., von Hippel and von Krogh, 2003; Chesbrough, 2003). The aim was to outline some new linkages and processes through which firm effectively adapt their value creation strategies, and more in general their business models, after a technological change undermined their profitability. In

summary, discontinuities may lead incumbents to exploit external knowledge to build new businesses and reduce costs. Value creation itself becomes less costly and potentially more effective when incumbents duly exploit external participation. A final consideration from the current finding is that the balance of closed and open models is necessary for established firms, as opposed to either exclusively embrace open strategies or remaining focused on their proprietary core knowledge. In fact, we testified a long process of transformation that started in 1997 and continued till the end of the study in 2014, and which was characterized by some successes but also difficulties to access and profitably exploiting external knowledge. Therefore, the study also complements previous researches about how organizations simultaneity combine contrasting activities, such as exploration and exploitation (e.g., Hoang and Rothaermel, 2010; Raisch et al., 2009), forward-looking and backward-looking (Gavetti and Levinthal, 2000), and flexibility and efficiency (Adler et al., 1999; Eisenhardt et al. 2010) to sustain their competitive advantage.

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7. Tables and Figures

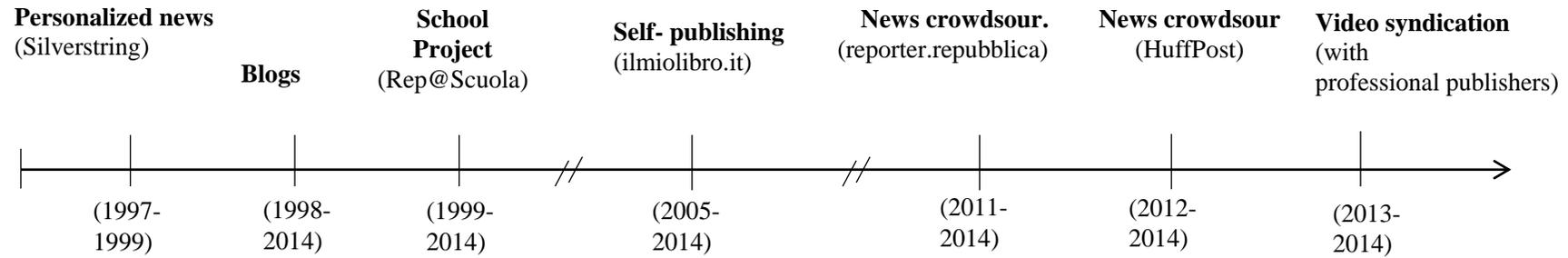
Table 1: Selected key informants

Projects	Informant's role(s)	Num. of interv.s
Personalized news	Internet & Multimedia Strategist; Co-founder “Kataweb Scuola”; Blogger (Zetavu)	1
	Deputy Director, Innovation & Development; Blogger (Giornalismo d'altri)	2
Forums/blogs	Managing editor of “repubblica.it”	1
	Information Architect; Blogger (Snodi);	1
	Former Manager Digital Division; Founder of Reporter; Blogger (Cablogrammi)	2
School newspapers	Deputy Director, Innovation & Development; Blogger (Giornalismo d'altri)	1
	Internet & Multimedia Strategist; Co-founder “Kataweb Scuola”; Blogger (Zetavu)	2
	Director Development & Innovation	1
Book publishing self-	Founder “ilmiolibro.it” & Digital Strategist	3
	Project manager Digital Division	2
	Former Product Manager	2
	Project Manager & Information Architect	1
News crowdsourcing, internally (Reporter.it)	Former Manager Digital Division; Founder of Reporter; Blogger (Cablogrammi)	2
	Information Architect; Blogger (Snodi);	2
	Editor-in-chief of the website	1
	DG Digital Division	1
	Head of Business Free Products	1
News crowdsourcing, in Joint venture (Huffington Post Italy)	CEO Huffington Post Italy	3
	President & Owner of Gruppo Editoriale L'Espresso	1
	Vice Executive Editor, Huffington Post Italy	2
	Social Media Editor, Huffington Post Italy	1
	Executive International Editor, Huffington Post US	1
	General Manager International, Huffington Post US	1
Video syndication	DG Digital Division	2
	Head of Business Free Products	1

External companies based on Open Models

Populis	President & Co-Founder (Blogsphere leader; 2004-present)	1
Banzai	President & Co-Founder (Quality UGC; 2006-present)	2
YouReporter	Co-Founder & CTO (video citizen journalism; 2008-present)	3
CityNews	Founder & CEO (citizen journalism; 2010-present)	2

Figure 1: Relevant projects through which GELE incorporated external knowledge, from 1997 to 2014



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Table 2: Projects and relevant dimensions

	Personalized news	Blogs	School project	Self publishing	News crowdsourc . (reporter)	News crowdsourc. (JV HuffPost)	Video syndication
Support/ investment	n	Y	Y	N	n	Y	Y
Autonomy	n	y/n	Y	Y	y/n	Y	y/n
Proximity to Core	y	Y	N	N	y	Y	Y
Open* / Closed	Low O	Low O	O	O	Low O	O	Low O
Entrants	n	Y	Y	N	y	Y	Y
Success	n	Y	Y	Y	n	Y	y/n

Table 3: Project comparison and theoretical interpretation of findings

Project compared	Theoretical insights
<p>reporter.repubblica.it VS youreporter.it</p> <p>GELE's local newspapers VS citynews.it</p>	<p>Business model innovation and external knowledge</p> <p>(when): Incumbent's revenues decline; Entrants exploit external knowledge</p> <p>(how): Incumbent focus on quality</p>
<p>School project & Self-publishing</p> <p>VS</p> <p>Personalized news & News Crowdsourcing</p>	<p>Distance from internal core business</p> <p>a low distance between the external knowledge and the internal core know-how may cause: incumbents' fear of cannibalization; external actors' unwillingness to share their knowledge with incumbents</p>
<p>JV with the HuffPost VS alone News Crowdsourcing</p>	<p>Partnerships for legitimacy</p> <p>forming partnerships with companies that already operate with external actors allows incumbents to access external knowledge, mitigating low distance problems</p>
<p>Personalized news VS School project</p>	<p>Entrepreneurship, support, and autonomy</p> <p>These elements are positively associated with success of projects attempting to exploit external knowledge</p>