

**THE STUDY OF EMERGING INDUSTRIES:
RECOGNIZING AND RESPONDING TO SOME CENTRAL PROBLEMS**

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EXECUTIVE SUMMARY

Understanding entrepreneurship requires us to pay attention to activities at several different levels: We need to understand what is happening within teams, firms, industries and nations as well as what particular individuals are doing. However, most past entrepreneurship research has focused on activities at or below the firm level, and few studies have explored entrepreneurship at the industry level (Chandler & Lyon, 2001; Davidsson & Wiklund, 2001). The reasons for this are both theoretical and empirical. Empirically, emerging industries are difficult to study, because it is often hard to identify emerging industries until after they have matured (Katz & MacMillan, 1987). In addition, many emerging industries fail, and it is even more difficult to find and study failed industries (Aldrich & Ruef, 2006). Over time, moreover, scholars tend to simply stop asking theoretical questions about phenomena that are hard to study empirically (Lampel & Shapira, 1995), and as a consequence fewer scholars try to solve the associated empirical problems. This field-wide, cyclical problem has led scholars to generally avoid studying emerging industries altogether. Our goal in this paper is to call attention to the need for further research on emerging industries and to address some of the theoretical and empirical challenges that inhibit research on this topic.

We begin by defining emerging industries. We then address some theoretical challenges associated with the study of emerging industries. In doing so, we underscore that industry emergence is theoretically significant in its own right, not simply as a component of the larger industry life cycle. Building on this observation, we contend that building a robust, field-wide program of scholarship on emerging industries will challenge scholars to develop and test theories that frame industry emergence in several distinct ways. In the next section, we consider the kinds of data scholars would need to address the theoretical challenges we identified. Specifically, we contend that there is a need for scholars to attend to sources of data that document the activities of a broad variety of individual and organizational actors, and we observe that this contrasts with the tendency of more established approaches to the study of emerging industries, which has been to focus on the producer firms that technically comprise the industry. We then propose that historical archives represent a critical and under-exploited resource for the study of

emerging industries. In doing so, we explain how archives can help scholars address certain methodological challenges associated with the study of emerging industries, and we discuss examples of the kinds of archives whose holdings might prove useful to future researchers. We also observe, however, that many of the relevant records are “ephemeral”, in that they are only available for a short period of time before they are permanently destroyed or lost, and that, for various reasons, the records of emerging industries are even less likely to be successfully archived in the future. Finally, we explain how scholars can mitigate this problem through the development of new archival initiatives designed to preserve and maintain the records of ephemeral industries.

We conclude by summarizing two general implications of our ideas, which we develop throughout the paper. First, understanding emerging industries more fully will require entrepreneurship scholars to collectively work with qualitative and historical data to a greater extent than they have in the recent past. Second, studying emerging industries will require scholars to collaborate across several streams of literature on macro-level entrepreneurial behavior (e.g., those rooted in economic, ecological, institutional and cognitive perspectives) and to engage more fully with various practitioners, including professional archivists and institutional entrepreneurs.

ABSTRACT

THE STUDY OF EMERGING INDUSTRIES

RECOGNIZING AND RESPONDING TO SOME CENTRAL PROBLEMS

The emergence of new industries is an important phenomenon that remains relatively neglected by researchers. We address several theoretical and methodological problems that impede the study of emerging industries. In doing so, we propose that historical archives represent a critical and under-utilized research resource. More generally, we contend that advancing the study of emerging industries will require scholars to develop several distinct categories of research, to make more extensive use of qualitative and historical data, to collaborate across traditional boundaries of domain and method and to engage key practitioners, including professional archivists and institutional entrepreneurs.

INTRODUCTION

The emergence of new industries is an important phenomenon that remains relatively neglected by researchers. Recent reviews have indicated, for example, that less than 10% of the entrepreneurship articles published over the last two decades have focused on the industry level of analysis (Chandler & Lyon, 2001; Davidsson & Wiklund, 2001; Dean et al., 2007). Underlying this neglect is a set of theoretical and empirical challenges that make it difficult to study emerging industries. Some of these challenges have been discussed within particular avenues of research, such as the problem of left-truncation in studies of population ecology (e.g., Baum & Powell, 1995). But researchers do not yet share a strong, holistic appreciation of these challenges. This is unfortunate for two reasons.

First, the consequent lack of research attention to emerging industries has contributed to the persistence of major gaps in our understanding of the organizational world (Aldrich & Ruef, 2006). Strategically, for example, new industries represent an important context within which firms compete. But consider how little is known about key processes that unfold in this context, such as the formation of strategic groups. Scholars have posed questions about strategic group formation for more than two decades (e.g., Lant & Phelps, 1999; Mehra & Floyd, 1987), but very few studies have addressed those questions empirically. Answers to such questions could help firms to interpret and respond to the threats and opportunities new industries present. Politically, moreover, new industries represent an important outcome for states and societies: new industries can revitalize economic growth and employment, and they can galvanize the development of environmentally-superior technologies (Russo, 2003). But much is left to be learned about how states might stimulate or shape the emergence of new industries (Eliasson, 2000; Schoonhoven & Romanelli, 2001). This is a timely question inasmuch as recent financial crises have underscored the interdependence of public- and private-sector actors in a variety of industries, but it is also complex question in that the answers are likely to differ from one country to the next (Spencer et al., 2005). In summary, there is a need for more studies that clarify how scholars, managers and policymakers can better understand and interact with emerging industries.

Second, the complexity and persistence of the challenges facing the study of emerging industries suggest that addressing those challenges will require the attention and cooperation of scholars from a broad variety of theoretical and methodological traditions. This includes management scholars working within various subdomains of entrepreneurship research but also others, such as organizational sociologists and business historians, who may identify less closely with the study of entrepreneurship.

For both of these reasons, we think it is worthwhile to offer a broader and deeper discussion of these issues than has previously been offered. To this end, we seek to call attention to the need for further research on emerging industries and to address some of the theoretical and empirical challenges that inhibit research on this topic. We begin by defining emerging industries. We then address some theoretical challenges associated with the study of emerging industries. In doing so, we underscore that industry emergence is theoretically significant in its own right, not simply as a component of the larger industry life cycle. Building on this observation, we contend that a robust, field-wide program of scholarship on emerging industries will require scholars to develop and test theories that frame industry emergence in several distinct ways. In the next section, we consider the kinds of data scholars would need in order to address the theoretical challenges we identified. Specifically, we contend that there is a need for scholars to attend to sources of data that document the activities of a broad variety of individual and organizational actors, and we observe that this contrasts with the tendency of more established approaches to the study of emerging industries, which has been to focus on those firms that technically comprise the industry itself.

In the second half of the paper, we propose that historical archives represent a critical and under-exploited resource for the study of emerging industries. In doing so, we explain how archives can help scholars address certain methodological challenges associated with the study of emerging industries, and we discuss examples of the kinds of archives whose holdings might prove useful to future researchers. We also observe, however, that many of the relevant records are “ephemeral”, in that they are only available for a short period of time before they are permanently destroyed or lost, and that, for various reasons, the records of emerging industries are even less likely to be successfully archived in the future.

Finally, we explain how scholars can mitigate this problem through the development of new archival initiatives designed to preserve and maintain the records of new industries.

We conclude by summarizing two general implications of our ideas, which we develop throughout the paper. First, understanding emerging industries more fully will require entrepreneurship scholars to collectively work with qualitative and historical data to a greater extent than they have in the recent past. Second, studying emerging industries will require scholars to collaborate across some of the boundaries that have traditionally separated subdomains of entrepreneurship research and to engage more fully with various practitioners, including professional archivists and institutional entrepreneurs.

EMERGING INDUSTRIES

The concept of an emerging industry represents the intersection of a unit of analysis and a temporal interval. The unit of analysis is the industry. The most common definition of an “industry” holds that it is a group of firms producing products that are close substitutes for one another (Porter, 1980; Hitt et al., 2009). This definition, which is derived from industrial economics, is frequently invoked in studies of strategy and organization. In seeking to operationalize this definition, strategy scholars have often drawn on standard industrial classifications of firms and products to determine the number of firms participating in an industry over time. Analytically, industries thus measured are quite similar to the “organizational populations” studied by organizational ecologists. Aldrich and Ruef (2006) observed that “in practice, ecologists often use the same data source as economists and just change the label” (p. 181).¹

Alternative definitions of industry have been offered. In fact, a number of studies have closely scrutinized the industry concept and pointed out limitations of the dominant, product-focused definition, and of measures based on industrial classification codes (e.g., Porac et al., 2002; Sampler, 1998). A common theme of these critiques is the contention that industry boundaries are socially constructed by industry participants and are inadequately represented by “objective” indicators of industry affiliation.

¹ Technically, organizational populations are defined by virtue of the fact that they share a common organizational “form”, which is to say that they share certain key features that allow them to be identified as members of a group of similar organizations (Romanelli, 1991; pp. 81-82).

We are sympathetic to some of these critiques. To the extent that emerging industries often arise at the periphery or interstices of standard classification codes, for example, it is clear that the codes themselves are of limited use in identifying or bounding emerging industries. It is also clear that studies based on alternative definitions of the industry concept have generated important insights about industry evolution (e.g., Porac et al., 2002; Spender, 1989). However, it is not our immediate purpose here to revise or challenge the prevailing definition of the industry concept. Moreover, part of our purpose in writing this paper is to try to reverse what we perceive to be an excessive splintering among several streams of literature on macro-level entrepreneurial behavior (e.g., those rooted in economic, ecological, institutional and cognitive perspectives) that are ultimately concerned with identical, or at least closely-related, phenomena. Ultimately, we think industry definitions based on subjective and objective criteria are both of value and that it is more profitable to explore both sets of definitions and the relationships between them than to dispense with one or the other (Abrahamson & Fombrun, 1994).² In this paper, therefore, to simplify the presentation of our arguments, we will adopt the standard definition of an industry as a set of firms producing closely-substitutable products. As we will explain, however, future research on industry emergence presents both the need and the opportunity for scholars to investigate more fully and precisely when and how specific sets of firms acquire and maintain “industry” status.

Emerging industries are industries in the earliest stage of development (Low & Abrahamson, 1997; Van de Ven & Garud, 1989). Accordingly, the concept of industry emergence corresponds to one temporal component, or interval, within an “industry life cycle” model of how industries evolve over time (McGahan et al., 2004). The length of this interval can vary significantly across industries, and its precise temporal boundaries are a subject of some disagreement. Low and Abrahamson (1997) mark the end of the emergent stage at the beginning of an industry’s growth stage, but others extend the emergent stage

² Another option, of course, is to dispense with the industry concept altogether, but this carries its own risks. Russo (2003) observes, for example, that the literature on organizations and the natural environment has tended to leap “from the organizational to the political-economic level”, bypassing in the process direct attention to industry-level phenomena (p. 317). In most of the management literature, moreover, industries – however defined – are of considerable interest: 30% of the article abstracts published in *Strategic Management Journal* between 2005 and 2009 invoked the industry concept. In *Organization Science* over the same time period, the figure is 17%.

past the growth stage to some later point, alternately characterized as “maturity”, “legitimation”, or “stability” (Aldrich & Ruef, 2006; Klepper & Graddy, 1990). Klepper and Graddy (1990) revealed that a single industry can take as few as two years and as many as 50 years or more to achieve stability, which they defined as the point at which the number of firms in the industry peaked. Thus, the emergent stage of an industry can be understood to include at least the first several years immediately following an industry’s founding. However, not all industries last long enough to experience all stages of development: Some never grow to maturity or legitimacy. Of these inchoate industries, some lie dormant for decades, but many others experience a conclusive death at some point. For these industries, the emergent stage can represent most or all of their entire history.

The producer firms that comprise a new industry may be either *de alio* or *de novo* entrants, or both (Khessina & Carroll, 2008; Lange et al., 2009). Some industries arise primarily through the entry of new, independent (*de novo*) firms, such as the many “dot-com” firms that took root in new Internet-related industries in the mid-1990s (Goldfarb et al., 2007). These are the instances of industry emergence that are perhaps most familiar to entrepreneurship researchers, since they encompass organizations that are themselves newly emerging. When Aldrich and Ruef (2006) discuss “population emergence”, for example, they refer to industries comprised primarily of *de novo* entrants, and they focus on the “especially acute problems of learning and legitimacy” such firms experience (p. 180). However, industry emergence need not depend entirely, or even primarily, on *de novo* entrants. For example, the disk array industry that emerged in the late 1980s and early 1990s was comprised primarily of large firms, such as IBM and Compaq, that had established businesses in other computer-related industries (McKendrick et al., 2003). Understanding more precisely which types of firms tend to arise in new industries, and under what conditions, remains an open question for future research. However, there is evidence that both types of firm entry (*de novo* and *de alio*) are common in many early-stage industries. For example, Agarwal and Audretsch (2001) found that most of the 33 industries they studied had between 20 and 100 entrants during their emergent stage and that those entrants were quite diverse with respect to age and size. In addition, there is evidence that *de novo* entry is more common than *de alio*

entry in emerging industries but also that *de novo* firms are, on average, less successful than *de alio* entrants (Dinlersoz & MacMillan, 2009; Geroski, 2003).

CHALLENGES FACING THE STUDY OF EMERGING INDUSTRIES

The questions scholars ask about a phenomenon are influenced by the availability of relevant data. When data are relatively abundant, many questions get asked, but fewer questions are asked of phenomena for which data are relatively scarce (Lampel & Shapira, 1995). This can result in a cyclical, chicken-and-egg problem wherein the difficulties of conducting empirical research restrict the volume and variety of questions scholars ask about a phenomenon, and this restriction in turn lowers the degree of collective effort scholars exert towards studying the phenomenon empirically. As this problem persists over time, it becomes difficult to say whether the underlying problem is primarily theoretical or empirical. Ultimately, it is both. However, it can be useful to focus on one or the other side of this problem in seeking a point of intervention through which to disrupt the cycle. We focus in this section on the theoretical challenges facing the study of emerging industries, because we believe that scholars will be better able to study such industries empirically if they first begin to ask a broader range of questions about them. To this end, we develop two points.

First, understanding the theoretical significance of emerging industries requires us to contemplate several distinct categories of research, some of which are more developed than others. Whereas studies in the tradition of industrial economics and organizational ecology have tended to assign theoretical significance to emerging industries based on their capacity to help us understand processes that unfold throughout later stages of the industry life-cycle – to frame emergence as the “left” side of a story whose “center” and “right” are comparatively well documented, so to speak – we emphasize that emerging industries are in fact complex and varied phenomena that may also serve as contexts for various *intra*-stage processes or as junctures that mark the end or middle of longer, multi-industry processes. Second, advancing our theoretical understanding of emerging industries depends not only on our ability to apply

and test existing theories but also on our ability to *develop* new theory (Elsbach et al., 1999).³ As we explain below, this need is especially pressing in this area at this time insofar as many aspects of industry emergence remain in a state of minimal theoretical development.

The theoretical significance of emerging industries

Thinking about the theoretical significance of emerging industries requires us to think about at least two kinds of temporal intervals: the interval represented by the empirical phenomenon of industry emergence and the interval associated with whatever theory a scholar might use in assigning theoretical significance to that phenomenon. Having discussed the interval of industry emergence, we turn our attention now to the intervals associated with organizational theories.

Zaheer and colleagues (1999) observe that “many organizational theories embody implicit time-scale assumptions” (p. 725). In short, they argue that the theoretical arguments researchers make correspond to particular temporal intervals in ways that are roughly analogous to the way such arguments correspond to particular levels of analysis. Thus, they note, “just as it is true that a theory that applies at the industry level may not hold at the firm level of analysis, so it is true that theory that is valid for one time interval may not be valid for another” (p. 725). They further contend that the temporal dimensions of theories are often left implicit and taken-for-granted, and they encourage scholars to be more explicit about how their theories correspond to specific intervals of time. This is important, because different theories correspond to very different intervals. Some theories correspond to intervals that span well beyond the emergent stage to include much or all of the entire life cycle of an industry. Examples of such theories include sociological theories of population ecology (e.g., Baum & Amburgey, 2002) and economic theories of industry evolution (e.g., Audretsch & Feldman, 1996). Other theories correspond to

³ In distinguishing between the building and testing of theory, we invoke a commonly-made distinction between two general approaches by which organizational researchers connect data with theory (e.g., Langley, 1999). The former approach involves using data to inductively generate new theoretical explanations, whereas the latter involves using data to test theoretical explanations that are deductively generated. Clearly, this distinction is not airtight: Some methods can be used both for theory-building and theory-testing, for example. However, most entrepreneurship articles emphasize *either* the first *or* the second approach (Gartner & Birley, 2002).

shorter intervals of time, including some that may fall within a particular stage of the industry life cycle. For example, strategy scholars have developed theories about how firms can compete more effectively during the declining stage of an industry (e.g., Harrigan, 1980). More recently, Spencer and colleagues (2005) have proposed a theory of how government policies influence new industry creation.

In assessing the theoretical significance of emerging industries, it is useful to think about how the two kinds of intervals described above might intersect. In other words, how do organizational theories spanning different temporal intervals address the phenomenon of industry emergence? For example, recall the basic distinction above between theories that extend beyond the emergent stage and theories situated within that stage. Scholars focused on longer-interval theories have generally been inclined to assign theoretical significance to industry emergence largely on the basis of what that period has to tell us about later periods. This inclination is reflected in Aldrich and Ruef's (2006) contention that "[t]he period during which a new population emerges deserves more theoretical attention, because the struggle to carve out a niche involves such strong forces that the events of that period *may be forever imprinted on the organizations that persist*" (p. 205) [italics added]. Although we agree with this claim, we hasten to add that new industries deserve attention not only because of their capacity to improve our theories about what happens to firms and industries throughout the entire industry life cycle, but also because we need to develop and test shorter-interval theories that explain more fully what happens at various levels of analysis within the period of industry emergence. In addition, there is a need for theory that frames industry emergence with reference to intervals of time that precede and transcend the conventional industry life cycle. We illustrate these arguments with Figure 1.

*** Insert Figure 1 here ***

Figure 1 portrays a timeline that maps the periods before, during and after industry emergence as well as four intervals of time about which scholars might build or test theory in connection with the study of emerging industries. Interval A begins in the emergent period and extends through later periods,

Interval B is confined to the emergent period, Interval C extends through the emergent period as well as the preceding period, and Interval D extends through all three periods.

Interval A encompasses sociological and economic theories that explain how industries evolve over the entirety, or nearly the entirety, of their lifespans (e.g., Baum & Amburgey, 2002). Because these theories are associated with longstanding programs of research, work in this category is relatively well-developed and easily recognized. However, appreciating alternative ways of framing the theoretical significance of emerging industries requires us to think about categories of research that are less well developed. For example, consider the category of research associated with Interval B, which is concerned with building and testing theory whose temporal scope falls *within* the period of industry emergence. Fewer studies have been done in this quadrant. One example is Rao's (2004) study of institutional activism in the early American automobile industry. Observing that "there is little empirical work that explicitly unravels how new industries become understood and taken for granted" (p. 360), Rao proposed and tested a model that held that public demonstration events organized by automobile clubs between 1895 and 1912 helped legitimize the automobile industry and pave the way for its growth. Another example is Lant and Phelps' (1999) inductive study of the sociocognitive emergence of strategic groups during the emergence of the Internet industry. Drawing on their observations of Internet startups in New York City in the late 1990s, they proposed a set of processes whereby groups of managers that shared similar cognitive categorizations began to exhibit similar strategic behaviors.

Alternative categories of theory are represented by Intervals C and D. These intervals situate the phenomenon of industry emergence within a larger historical context that extends backward to include some period of time prior to industry emergence. Studies that invoke theories corresponding to these intervals are exemplified by Christensen's historical analyses of the disk drive industry (e.g., Christensen, 1993; Christensen & Bower, 1996), in which he examined corporate-and industry-level data to build a theoretical explanation for why firms in relatively established industries may be especially vulnerable to the disruptive threats an emerging industry can pose. Another example is Garud and colleagues' (2002) study of Sun Microsystems' efforts to sponsor its Java technology as a common standard even before the

clear emergence of product-markets based on that technology. As with Christensen's work, the temporal scope of these authors' theoretical arguments extends beyond the boundaries that are generally thought to define a specific interval of industry emergence and instead reach back into the "pre-history" of emergence as it might be manifested within the life cycle of distinct but related industries. Despite these contributions, however, there is a need for more studies capable of developing and refining new theoretical perspectives associated with Intervals C and D. McGahan and colleagues (2004) underscored this need by calling attention to the fact that, despite the clear practical and theoretical importance of the industry life cycle model, "the core theory underlying the model is not fully articulated" (p. 15). In particular, they note, more work needs to be done to put the life cycle "in context" so that scholars can understand its boundaries more fully and distinguish more clearly between transitions that occur *within* industries and those that occur *between* industries. Work of this nature would require scholars to develop more explicit heuristics for recognizing the "signals" that mark an industry's inception and demise.

The need for new theory

To the extent that research in several of the aforementioned categories remains relatively underdeveloped, there is a particular need for research that can build new theories that span the corresponding intervals of time (i.e., Intervals B, C and D). Echoing the longstanding notion that the selection of an appropriate research approach depends on the state of prior knowledge in a given research domain, Edmondson and McManus (2007) contend that in domains where theory remains poorly developed, or "nascent", the contributions most needed from empirical research are those that provide a "suggestive theory", not formal tests of existing theory. Practically speaking, in their view, this means there is a particular need for scholars to attend to "rich, detailed and evocative" data that require qualitative interpretation (p. 1162) and to analyze these data in ways that enable them to develop new constructs or propose "tentative answers to novel questions of how and why" (p. 1158). Santos and Eisenhardt's (2009) recent study of how five firms constructed organizational boundaries during the emergence of a telecommunications industry illustrates this approach by building new theory within

Interval B that lays the foundations for further research. We share the view that qualitative, theory-building methods have an especially important role to play in advancing research on emerging industries, and we consider some implications of this point in later sections.

We also think exploratory studies devoted simply to the identification of “stylized facts” can be a valuable antecedent to more formal studies that develop or test theory. Helfat (2007) made this point in arguing that scholars should not wait – and should not be expected to wait – for theory development in the traditional sense before going ahead to explore important, understudied phenomena: “We must understand at least the broad outlines of ‘what’ a phenomenon consists of,” she observes, “before we try to explain ‘why’ it occurs” (p. 185). Goldfarb and colleagues’ (2007) study of investor behavior during the emergence of the Internet industry provides an example of a study that identifies a set of stylized facts which, although rooted in a specific context, suggest important new directions for theory.

WHAT KINDS OF DATA DO WE NEED TO STUDY EMERGING INDUSTRIES?

In the preceding section, we argued that in order to fully explore the theoretical significance of emerging industries, scholars must pay more attention to the development and testing of two types of theories: 1) those that explain what happens within the period of industry emergence, and 2) those capable of explaining how the period of emergence relates to activities in prior historical periods. Turning now to some methodological implications of these observations, we contend that studies exploring either type of theory will require scholars to attend to sources of data that document the activities of a broad variety of individual and organizational actors beyond those firms that technically comprise the industry itself. This approach to data collection differs from the approach generally favored by industrial economists and organizational ecologists, which has instead focused largely, and in some cases exclusively, on documenting the producer firms themselves (e.g., Agarwal & Bayus, 2004; Baum & Amburgey, 2002). Studies of producer firms have, of course, generated important insights that account for some of what little we know about industry emergence, and what we say here is not meant to discount or discourage

such studies. However, we wish to call attention to the need for scholars to gather and analyze data that document the larger context of industry creation more fully. Several considerations underlie this need.

First, an important subset of unanswered theoretical questions has to do with why industries that might have emerged failed to do so (Aldrich & Ruef, 2006). This will require scholars to broaden their empirical focus beyond the activities of producer firms for two reasons. First, instances of industry failure may never generate more than a small number of producer firms (Geroski, 2003). The identities and behaviors of those firms would be instructive to scholars trying to understand why such industries failed, but only partially so. Second, it can be difficult to even *identify* instances of industry failure (MacMillan & Katz, 1987). To the extent that an industry's failure is understood to represent its failure to achieve sociopolitical legitimacy (Rao, 2004), for example, this by definition implies that external actors have refrained – either consciously or unconsciously – from recognizing a given set of firms as an industry. The empirical study of such “might-have-been” industries requires scholars to study sets of firms that are bounded by parameters other than recognized industry boundaries (Pólos et al., 2002).

Clearly, emerging industries that have not failed are easier to recognize and study. But past research suggests that understanding these instances of emergence will also require data sources that extend considerably beyond those that document the birth, death or behavior of producer firms. Van de Ven (1993) made this point conceptually when he proposed that new industries arose not only through the activities of individual entrepreneurs and their firms but through an “infrastructure” that encompasses “the accretion of numerous ... events that co-produce each other through the actions of many public and private sector actors over an extended period” (p. 227). Similarly, Eliasson (2000) has proposed that new industries are initiated and stimulated by a diverse set of specialized actors, termed a “competence bloc”, which encompasses customers, innovators, financiers and exit markets. Both concepts essentially frame industry emergence as a process that unfolds across an “organizational field” which includes but extends beyond the focal industry (Sine & David, 2002), and they do so by identifying specific configurations of actors at various levels whose interactions are most likely to matter.

More recently, empirical work has begun to explain more fully how these sets of actors interact to give rise to successful instances of industry emergence. For example, von Burg and Kenney (2000) documented the critical role that venture capitalists played in the birth of the local area networking industry. In addition, Sine and colleagues (2005) showed that the rates and types of firm foundings within the emergent independent power sector of the electricity industry were influenced by the development of regulative, cognitive and normative institutions. Separately, McKenna's (2006) account of the birth of the management consulting industry traces the workings of a broad and dynamic infrastructure encompassing several previously-established industries and the state.

Thus, there is a theoretical and empirical basis for the expectation that the sources of data relevant to the study of emerging industries extend considerably beyond those that document the birth, death or behavior of their producer firms. Much of what lies within this broader universe of relevant data sources may not be recognizable as "data" to many contemporary entrepreneurship researchers. Indeed, one goal of this paper is to encourage scholars to contemplate the potential research value of a broad variety of materials – e.g., materials available in a variety of different media from a variety of sources. We will refer to such potentially-useful materials as "records", which is the term historians use to refer to materials that document activity within a given domain regardless of whether or not they have yet been marshaled for any specific research objective (e.g., Jones & Cantelon, 1993).

Several key categories of records relevant to the study of emerging industries can be identified by considering the constituent phenomena to which the records pertain as well as the sources by which the records are created. Van de Ven and Garud (1989) map the range of actors relevant to industry emergence by identifying three major subsystems of industry infrastructure. The first subsystem, which is associated with what they call "instrumental" functions, includes those producer firms whose goods and services define the industry as well as their buyers and suppliers. The second subsystem includes providers of critical resource endowments, such as universities, whose research and educational activities may represent a source of human capital for the industries, as well as investors that help to finance the industry. The third subsystem comprises the institutional infrastructure of an emerging industry, which

may include public sector institutions, such as patent agencies or other government ministries devoted to cultivating industrial development, as well as non-profit institutions, such as trade associations and standard-setting bodies, that reflect cooperative efforts undertaken by firms in or around the industry.

Activities within each of these subsystems can be documented through records created by “internal” or “external” sources. Internal documentation refers to the records generated by the individual and institutional actors that make up the subsystems outlined above, whereas external documentation includes information about these actors that was created elsewhere (Ericson, 1997). Thus, internal documentation of the instrumental functions of an industry may include corporate records, press releases, annual reports, employee manuals and internal memos, whereas external documentation of these functions may be found in newspaper articles, published books and government records. Because there are linkages among subsystems of an industry, an external source of records on one infrastructure component may simultaneously represent an internal source of records on another.

Table 1 summarizes some key categories and sources of records relevant to emerging industries.

*** Insert Table 1 here ***

We have argued that research on emerging industries will challenge scholars to flesh out several underdeveloped categories of research. We also argued that this, in turn, will require scholars to attend to data sources that document the activities of a variety of individual and organizational actors, not just the behavior of a single set of competing firms. We further observed that rich, detailed data will be especially important to the development of new theory about emerging industries. We now consider how scholars can respond to these methodological requirements.

Field research as a data collection strategy

One avenue of response to the methodological challenges of studying emerging industries is for scholars to study them on a contemporaneous or “real-time” basis by monitoring events as they unfold in

the field. Field research on emerging industries can give scholars access to various kinds of data on emerging industries that may be difficult for them to obtain later on, including secondary data sources, such as those summarized in Table 1, and primary data collected through interviews, surveys or direct observation. Field studies based on such data have generated important insights about various aspects of industry emergence (e.g., Murtha et al., 2001; Santos & Eisenhardt, 2009).

Nevertheless, field research on emerging industries is subject to some important limitations. For example, the window of opportunity during which scholars can conduct field research is generally confined to an actual period of emergence. The brevity of many such periods and the speed with which they can unfold make it hard for scholars to design, fund and execute field studies of emerging industries in a timely manner. Some windows may simply be too short to adequately explore certain questions. A more subtle limitation of field research is that the contemporaneous study of industry emergence tends to limit the study of emerging industries to those approaches that are concurrently favored among researchers. This can be problematic over the long run, because it is unrealistic to expect that the best research approaches for understanding certain phenomena will consistently be available for contemporaneous application. For both of these reasons, the study of ephemeral records in emerging industries must also encompass the use of archival records. In the next section, we argue that historical archives represent a valuable tool scholars can use to rise to the theoretical challenges we have identified.

HISTORICAL ARCHIVES AS A RESOURCE FOR THE STUDY OF EMERGING INDUSTRIES

Historical archives are repositories of historical records. They are typically created and maintained by professional business historians (called “archivists”) who specialize in archiving records on behalf of an institutional sponsor, such as a university, a corporation, a trade association or a nation-state (ICA, 2004; O’Toole, 1997). Historical archives differ from the typical data collection activities of organizational scholars in two key respects. First, the collection practices of historical archives are generally broader in scope than the data collection efforts associated with any particular study. Second, historical archives are generally more widely accessible than the proprietary archival datasets commonly

used in organizational research. Thus, whereas in any particular study, data collection is generally guided by a well-defined, theoretically-grounded research question, and analysis is undertaken shortly thereafter by the same people who oversaw data collection, historical archives are designed to preserve records for an indefinite period of time that may extend decades into the future for the benefit of a public or semi-public community of scholars whose particular identities and interests are not known in advance.

These characteristics of historical archives mean that the records they contain are generally less readily “analyzable” than are the data from more familiar entrepreneurship databases, such as the Panel Study on Entrepreneurial Dynamics. For example, many archival collections emphasize textual records over quantitative ones and feature deep coverage of particular organizations, people and events but may lack breadth or representativeness on certain dimensions of interest. To some extent, therefore, exploiting these archives is likely to require the use of qualitative methods of analysis. Recent entrepreneurship research, by contrast, has tended to favor quantitative methods and to *de-emphasize* the historical context of entrepreneurial activity (Chandler & Lyon, 2001; Gartner & Birley, 2002). But historical entrepreneurship research is not unprecedented. In fact, business historians helped to pioneer the study of entrepreneurship in the middle of the Twentieth Century (Jones & Wadhvani, 2007). More recently, Barley (1998) has outlined some ways in which historical narratives can inform the development and refinement of theories of innovation: by “typifying” historical eras that are thought to be “atypical”, for example, and by “connecting” phenomena that are thought to be “discontinuous”. Still, historical records do not necessarily require qualitative analysis; they can be coded, mapped and counted, for example, in ways that render them amenable to quantitative analysis (Langley, 1999). In addition, historical records can strengthen the theoretical foundations of quantitative analyses even when they are insufficient to serve as a primary datasource (Chandy et al., 2004).

Uses of historical archives

The archives of established firms and industries of the present and past represent “low-hanging fruit” for scholars, because established entities are more likely to have attracted enough resources and

attention to provide an extensive and well-preserved set of historical records. For example, many records of the American film industry have been preserved and maintained by the American Film Institute. Several scholars have drawn upon these records in studying the emergence of the American film industry with both qualitative and quantitative methods (e.g., Jones, 1999; Mezias & Boyle, 2005).

Similarly, to the extent that large, multi-unit firms can play a central role in industry emergence, understanding some instances of emergence may require scholars to look for archival records that document in detail what has happened *within* a small number of large, established firms (e.g., Garud & Rappa, 1994). Clearly, studying industry emergence based on the records of established firms and industries poses problems of left-truncation and survival bias, which limit the value of this approach. Nevertheless, some studies of successful, well-documented firms and industries may be especially useful in developing and testing theoretical propositions that extend across multiple stages in the industry lifespan. One resource for such studies is gradually taking shape through the Firm and Industry Evolution and Entrepreneurship (or “FIVE”) Project (Helfat & Klepper, 2007). The coordinators of this project have assembled a collection of forty-five industry datasets that were once privately held by individual researchers and have obtained permission to make these datasets freely available for further research (<http://five.dartmouth.edu>).

Alternatively, scholars should consider exploiting historical archives whose scope is not defined with reference to any particular firm or industry but rather with reference to categorizations of organizational activity made at higher levels of analysis, such as domains of scientific knowledge or nation-states. There exist many archives that are organized in precisely this way. For example, the Charles Babbage Institute (CBI) is an archive and research center devoted to the history of information technology. The holdings of the CBI include the corporate records of leading technology firms, records of industry associations, professional associations and users groups and the private papers of dozens of scientific and managerial leaders. The archives of the Chemical Heritage Foundation (CHF) are another example. The CHF is an archive, research center and museum devoted to preserving the heritage of the chemical and molecular sciences, technologies and industries. The CHF maintains collections related to

these topics, encourages research on these collections and carries out a program of interpretation and outreach. Although the CHF is based in the US, many of its activities are global in scope. At the national level, the Danish National Business Archive collects and maintains business records generated by businesses headquartered in Denmark and, accordingly, maintains holdings on a range of industries.

Broad-based, multi-industry archives of this kind have two key advantages. First, such archives facilitate the study of failed or short-lived industries. As we noted earlier, a key barrier to the study of failed industries is that they are hard to identify as such. Some emerging industries are ultimately too unsuccessful or short-lived to qualify as discrete, coherent industries, whereas others are too small or too technically or geographically obscure to attract general attention. However, archives that document broad domains of commercial activity make it possible for scholars to study activities that fall “in between” existing industries and which constitute instances of industry emergence but remain overlooked.

Recent work by McKendrick and his colleagues is instructive in some respects (McKendrick & Carroll, 2001; McKendrick et al., 2003). Drawing on ecological and institutional theories, these scholars characterized the emergence of the disk array industry as an instance in which a population failed to establish itself as an organizational form. In doing so, they focused on a relatively broad and evolving set of commercial activities, identified a subset of those activities that met some – but not all – of the theoretical criteria associated with industry emergence, and developed new theory about why this instance of emergence remained incomplete and the conditions under which it might have been completed. Historical archives would seem to offer fertile ground for scholars seeking to build on this example. For example, to the extent that developments in information technology and chemistry have given rise to many commercial activities that could be plausibly characterized as instances of industry emergence that have met with varying degrees of success, scholars could use the holdings of the CBI or the CHF to study theoretical questions about the antecedents or long-term dynamics of industry emergence.

A second advantage of broad-based, multi-industry archives is that the scope of these archives’ holdings facilitates the development and testing of theory about these nascent industries’ relationships to their larger commercial contexts. An example of past work that illustrates this potential is Kirsch’s

(2000) study of the electric vehicle industry. In documenting the emergence and decline of this short-lived industry between roughly 1890 and 1910, Kirsch underscores that although electric vehicles were ultimately displaced by vehicles powered by internal combustion engines, these two types of vehicles were not in fact directly competitive; rather, they were associated with alternative transportation *systems*. Electric vehicles provided local and regional transportation service in major urban areas and operated on a taxicab-style business model: Instead of being sold directly to individual passenger-drivers, many were integrated with other, complementary transportation systems, such as railroads. Thus, the ultimate triumph of gas-powered cars was the product of a complex and multifaceted contest between alternative sets of product attributes (and product-evaluation criteria) and their respective systems of supporting infrastructure. This explanation of the industry's failure was richer and more accurate than prior technologically-focused accounts had been, and it was strongly informed by Kirsch's attention to the industry's historical context as it had been documented in a variety of historical archives, including those of the Commonwealth Edison Company, the Henry Ford Museum and the Library of (the U.S.) Congress.

Table 2 lists examples of other historical archives whose holdings may be relevant to the study of emerging industries. These include archives maintained by individual corporations as well as more general archives that maintain business-related holdings. The table also identifies associations that coordinate the preservation and maintenance of business records in several of the world's largest economies. In general, institutions and norms that support the preservation and maintenance of business archives are more established in the U.S., Europe and Commonwealth countries than elsewhere. However, business archives exist across the world, and efforts have been made in recent years to further develop and coordinate such archives across a broader range of countries (ICA, 2004; Matsuzaki, 2007).

*** Insert Table 2 here ***

The problem of ephemeral records

In the prior section, we explained why historical archives present rich opportunities for scholars to expand their study of emerging industries. Despite these opportunities, however, the records of emerging industries pose a special challenge for both archivists and researchers. Specifically, many of the records that researchers need to explore questions about emerging industries are “ephemeral” in that they are only available for a short period of time before they are permanently destroyed or lost. Records from any stage in an industry’s development may prove to be ephemeral, of course, but emerging industries are likely to be especially vulnerable to this problem for several reasons.

Some of these reasons are related to more general problems of data scarcity in entrepreneurship, which have been discussed elsewhere (e.g., MacMillan & Katz, 1987). Perhaps the most basic source of the problem, for example, is that many emerging industries fail quickly and, accordingly, never live past their emergent stage. Early failure diminishes the likelihood that either internal or external records of the industry’s firms will survive unassisted. One reason for this is that the failure of an industry is often accompanied by the disbanding of many of its constituent firms and of any elements of infrastructure that might have developed. Most notably, the *de novo* firms that account for many instances of firm entry also tend to experience high rates of failure (Geroski, 2003). Accordingly, industry failure may result in the destruction or dispersal of records that might have been used to study the industry.

What is less well appreciated, however, is that records from emerging industries are likely to be *increasingly* vulnerable to the problem of ephemeral records in the future as a consequence of several sociohistorical trends. Technologically, for example, although the rise of digital records makes it feasible to store information more efficiently than was once possible, the obsolescence of records storage and retrieval systems presents major new challenges as well. Whereas records preserved on paper are generally usable for decades and even centuries, provided they are properly maintained, digital records created in old versions of programs or on programs that are no longer in use will be difficult and perhaps impossible to use decades later (Rosenzweig, 2003). As Jeff Rothenberg of the RAND Corporation has quipped, “digital information lasts forever – or five years, whichever comes first”. Even if digital records

do survive in a readable format, moreover, those records must still be consciously preserved and organized if they are ever to be of value to researchers. The economist Greenstein (1990) underscored this point in his humorous account of the considerable difficulties he encountered in tracking down a set of computer tapes documenting the development of the computer industry.

The globalization of commerce is another major trend affecting the ephemerality of records in emerging industries. Increasingly, the emergence of new industries involves the coordination of behavior among individuals and firms across national boundaries. In some cases, this phenomenon involves the sharing of knowledge and resources among divisions of large multinational firms (Murtha et al., 2001). In other cases, it involves the behavior of new ventures that operate in multiple national markets at their founding. In either event, globalization implies that the records associated with new industry emergence are increasingly likely to be dispersed across national boundaries. Accordingly, these records may exist in multiple languages and be subject to multiple institutional regimes governing their ownership and release, thereby complicating efforts to identify and preserve these records.

Finally, new industries are becoming increasingly knowledge-intensive, meaning that the key drivers of competitive advantage in such industries are less likely to take the form of tangible assets and more likely to pertain to firms' abilities to develop, transfer and exploit their knowledge. This development is likely to reinforce the aforementioned trend towards globalization. As Murtha and colleagues (2001) observe in their book on the emergence of the flat-panel display (FPD) industry, the knowledge-intensiveness of that industry was related to its early globalization, since the relevant capabilities could not reside within any single country's borders. They explain:

Unique aspects of the FPD industry's emergence foreshadowed challenges that will define new industry creation in the future, most notably globalization from the start combined with an unprecedented rate of change. Rapid change was both a cause and a consequence of knowledge-intensity. The central strategic challenge involved managing people and partnerships internationally, over time to repeatedly create, retain, and transfer knowledge across new product and manufacturing generations before anyone else could do it. (p. xii)

These remarks point to two further implications of knowledge-intensiveness for the ephemerality of records. First, increasing knowledge-intensiveness is likely to affect the manner in which individuals and firms keep records. Owing in part to imperatives for speed and in part to the tacit nature of much organizational knowledge, industry participants may spend less time creating and maintaining formal, explicit records of their activities, with the consequence that emerging industries of the future may leave a smaller “data footprint” than they once did. Moreover, the intense competition surrounding participants’ efforts to exploit their own knowledge may mean that even when formal, explicit records of knowledge-related activity are available, participants may become increasingly secretive about those records. Consequently, they may be increasingly reluctant to make those records available to researchers, or they may simply destroy them. For large firms operating in countries with litigious business environments, such as the U.S., this tendency may be reinforced by legal liability concerns as well. Thus, paradoxically, the increasing importance of knowledge-based assets will increase the short-term preservation of industry records while simultaneously enhancing the likelihood of their long-term destruction.

For all of these reasons, the records of emerging industries are even less likely to be successfully archived in the future. To this extent, the capacity of existing archival resources to meet scholars’ needs will deteriorate over time. Accordingly, it behooves us to consider ways of mitigating this problem.

Designing new archival initiatives to preserve the records of emerging industries

The business historian Bruemmer (1997) warns: “There is no Darwinian law for business documentation; the best historical records do not necessarily survive over the most historically worthless. For that to happen, someone must actively guide the preservation of historical documentation” (p. 138). Inspired by this insight, we contend that the continued study of emerging industries calls for the development of new archival initiatives designed to assemble and preserve the records of emerging industries. In some sense, of course, any individual researcher’s attempt to collect data for a particular study can be construed as an archival initiative. What we have in mind here, however, are new initiatives modeled on the historical archives described above. These could be entirely new, independent archives

whose design and governance are modeled after those of existing archives but which are targeted to the records from emerging industries. Alternatively, new archival initiatives could be incorporated within various existing institutions whose missions already encompass the preservation of business records, such as museums or university-based centers, serving to extend and reinforce their work.

One example of a recently-developed archive of emerging industry records is the Business Plan Archive (BPA). The BPA is an online repository for business plans and other “planning documents,” which are defined as material that helps to explain the assumptions, strategies and tactics that underlie the creation of a startup firm. In particular, the archive documents the earliest years of the commercialization of Internet-related technologies, a period spanning roughly the five years between 1996 and 2001. To this end, the BPA solicits material from private equity investors and likely producers of business plans, as well as the public at large. Access to this material is then granted to registered users in accordance with the preferences of the donors and the academic merits of intended use. The BPA’s design was guided by the belief that reliably documenting the Internet boom requires the preservation of records obtained through a direct and broad solicitation of the firms and individuals who participated in it. This belief has several bases: First, that those participants are themselves an indispensable source of records pertaining to the Internet boom, an economic phenomenon characterized by a large and dispersed population of small, independent firms; second, that contributions from such participants are needed in order to head off the risk that surviving accounts of the Internet boom may be dominated by a handful of “celebrity” participants to the exclusion of the many “less-than-famous” participants; and third, that those participants can aid in the organization and interpretation of these records over time by forming a community of practitioners interested in exchanging their accounts and ideas (Henry, 2002). By early 2008, the BPA had collected more than 3,000 digital files and supported roughly 80,000 registered users. Details of the BPA can be found online at <http://www.businessplanarchive.org>.

Another example is the Medical Device Industry Oral History Project. This project is an archival initiative that was recently undertaken by the Minnesota Historical Society (MHS), a regional historical society that represents one of the two largest collecting repositories of business records in the U.S.

Because the MHS' mission calls for it to preserve the records of businesses and industries that play a significant role in the history of the State of Minnesota, MHS historians recently sought to document the emergence of a regional industry cluster focused on medical devices. The MHS initially intended to develop an archive based largely on printed materials solicited from producer firms within this cluster, but input from an industry leader prompted a change in their archival strategy. Jim Fogerty, the MHS historian who headed this project, explains:

I still recall ... trying to convince [Earl Bakken, the founder of Medtronic] of the need to establish a corporate archives to deal with Medtronic's records. He did not disagree, but had a very different view of the urgency necessary to capture the story of this fast-changing and relatively new industry. He told me, 'The records are all very fine. But if you don't know how a product was really developed – who worked with whom, how refinements were produced, which ideas worked and which didn't and why – you are missing the core of the story. None of those pieces of information are written down,' he said, 'they are all in people's memories.' [He] was right ... that in people's minds lies far more information than is ever written down, and that the telling of it in their own words adds immeasurable color and interest and value to the historical record. (Fogerty, 2006)

Prompted by this advice, the MHS undertook a set of recorded interviews with 16 individuals deemed to have made "pioneering" scientific and managerial contributions to the development of the medical device industry. Interviews were conducted between 1995 and 2001 but covered industry developments occurring over several decades. Interviews were recorded on audiotape and, in some cases, videotape. Altogether, they comprise over 30 hours of tape, or over 500 transcribed pages. Today these archival materials are available from the MHS, and selections of them can be previewed on the Society's website (www.mnhs.org/collections/medTech/).

Initiatives like these represent a model of collecting organizational records that is orthogonal to the theory-guided, question-focused paradigm of data collection that is appropriate to individual research projects. It is impossible to say in advance whether or precisely how any particular set of archival records collected in this manner will ultimately prove useful. Relatedly, we can not anticipate with certainty the timing or magnitude of the "payoff" that any particular archival initiative will actually deliver (Greene &

Daniels-Howell, 1997). However, initiatives can be designed in ways that make it more or less likely that their records will someday serve at least a supplementary purpose in the context of particular studies.

For example, focusing an initiative's collection efforts on specific *sources* of industry records can increase the likelihood that records will contain units of data that can be reliably compared across cases or aggregated into larger units. The initiatives profiled above illustrate such a focus: They are "practitioner-focused" in that they attempt to leverage the localized knowledge held by managers and others who participated in the historical events being documented as opposed to, say, industry knowledge that was accumulated by surrounding institutions or held by expert observers. Other relevant design considerations involve enhancing the likelihood that researchers will be able to use the data once it is preserved. Facilitating broad access to an archive furthers this goal by increasing the number of potential projects in which the records might be used. In addition, archival records can be "processed" – i.e., organized, summarized and otherwise made navigable – in ways that facilitate their use. Although processing has traditionally been among the most expensive and labor-intensive archival activities, it is also arguably the most important in that effective processing dramatically increases the likelihood that collected records will be profitably used (Greenstein, 1990; Jones & Cantelon, 1993).

It might be argued that entrepreneurship scholars should delegate these matters entirely to archivists, librarians or other specialists. However, by being involved in the design and implementation of new archival initiatives, entrepreneurship scholars can shape those initiatives in ways that render the collections more accessible and useful to them. In addition, such initiatives can provide scholars with a mechanism for bridging the gap between theory and practice. Van de Ven and Johnson (2006) contend that scholars can advance both the rigor and relevance of their work by striving to "organize [a] research project as a collaborative learning community of scholars and practitioners with diverse perspectives" (p. 815). Archival initiatives can provide a basis for such a community, which in turn can facilitate scholarly opportunities for field research, funding and knowledge transfer. For their part, practitioners in emerging industries will need to be persuaded that the challenges and disincentives associated with preserving and

sharing industry records can be offset by the potential for these practices to contribute to their own objectives, which may include strategic planning, marketing and knowledge-management.

CONCLUSION

As the economic disruptions associated with globalization and technological change continue to foster the rapid creation and demise of new industries (Hunt & Aldrich, 1998), scholars will be prompted by both an academically- and practically-grounded desire to better understand the phenomenon of industry emergence in various contexts and at various levels of analysis. In order to translate their curiosity into knowledge, however, scholars will need to confront several challenges that impede the study of emerging industries. In this paper, we have tried to identify and address several important challenges of this kind. Specifically, we have called attention to the need for scholars to develop and test theories that frame industry emergence in a variety of different ways. In addition, we have explored some methodological implications of that need in three ways: 1) by specifying the kinds of data that scholars would need to study emerging industries more fully; 2) by elaborating on the potential for historical archives to help scholars find and utilize the data they need to study emerging industries; and 3) by discussing the long-term need for scholars to participate in the development of new archival initiatives capable of preserving the records of emerging industries. We summarize our key arguments in Table 3.

*** Insert Table 3 here ***

Our analysis carries two key implications. First, there is a need for more research on emerging industries and, in particular, for studies that make more active use of qualitative and historical data. To some extent, qualitative methods are called for as well. This is true in part because many of the sources of records we have identified are more readily amenable to exploration by such methods, and partly because the underdeveloped state of theoretical knowledge about emerging industries calls for methods suited to extracting suggestive theoretical answers to “how and why” questions from rich, detailed data.

Moreover, what we know about industry emergence suggests that it involves the interaction of various types of organizations and institutions and, accordingly, requires scholars to pay careful attention to the broader economic and historical context within which industry emergence occurs.

A second implication of our ideas is that scholars will need to collaborate with one another and with various practitioners to successfully identify, preserve, access and analyze the records they need to study emerging industries. This is true because knowledge about the relevant theories, methods and data sources spans several of the subdomains or “camps” that populate the specialized world of contemporary entrepreneurship research, such as those organized around particular phenomena or disciplines. Meanwhile, as we have observed, much field-level knowledge is not explicitly recorded but rather lies “embedded” in the people and organizations who actually participate in new industry creation. As the initial custodians of industry records, these people and organizations determine the extensiveness, representativeness and accuracy with which those records are generated, preserved and made available. Relatedly, as agents of industry emergence, practitioners are themselves important sources of records by virtue of their own actions and experiences. Scholars can engage practitioners in supporting and even participating in the production of knowledge about how and why specific industries emerge as they do by soliciting their records, collecting oral histories or using Internet-based bulletin boards or other forms of collaborative media. A model of this kind of interaction is the quarterly magazine of the CHF, *Chemical Heritage*, which has a circulation of over 20,000 and features articles, interviews, letters and unsolicited “reminiscence” essays through which scholars and practitioners exchange knowledge. Another model exists in the example of Japanese *shashi*, a genre of corporate histories which are compiled and published by companies themselves for employee education and internal reference (Matsuzaki, 2007). The production of *shashi*-like histories may help to encourage companies and industries to participate more actively in the preservation and maintenance of their own records.

As both of these implications suggest, we believe these issues call for input from a range of scholars far wider than ourselves. Accordingly, we look forward to future contributions on this topic, including those that would challenge our assumptions or redirect our proposals.

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TABLE 1

Key categories and sources of records relevant to the study of emerging industries

	Internal	External
Instrumental subsystem	Websites, business plans, press releases and other records from: Industry firms Buyers & suppliers	Trade association directories Trade & other business press Incorporation records Tax records Bankruptcy & acquisition records Telephone listings Product catalogs & advertisements
Providers of critical resource endowments	Records & publications from: Schools & universities Professional associations Investment companies & clubs Student & alumni organizations	Financial & other business press Job postings
Institutional infrastructure	Records & publications from: Government agencies Trade associations Standard-setting bodies	General press Trade & other business press

TABLE 2

Examples of business archives and archival associations

Category of business activity	Examples of companies within this category that maintain archives*	Examples of other entities that maintain business archives relevant to this category*
Health	Abbott Laboratories Bausch & Lomb Merck & Co. UnumProvident	Bell Association for the Deaf & Hard of Hearing Minnesota Historical Society National Institutes of Health, Office of History Wellcome Library for the History of Medicine (London, UK)
Food products	General Mills Inc. Gerber Products Co. Sara Lee Corp. Wrigley Co.	Academy of Food Marketing, Campbell Library Culinary Institute of America, Hilton Library Food Marketing Institute Schlesinger Library Culinary History Collection at Radcliffe Institute
Financial	Allstate Corp. Bank of America Credit Agricole (Paris, France) HSBC Group Archives (London, UK)	Archives for the History of Financial Planning at Texas Tech U. Credit Union National Association Securities & Exchange Commission Historical Society European Investment Bank (Florence, Italy)
<p>Examples of associations that coordinate among business archives</p> <p>International Council on Archives, Section for Business & Labour (Paris, France) In the US: Society of American Archivists, Business Archives Section In the UK: Business Archives Council In Germany: Association of German Business Archivists In Japan: Business Archives Association</p>		

* All of the companies and entities listed are based in the United States, unless otherwise noted. In addition, each of the archives listed is at least partially open to outside researchers, although in some cases obtaining access may require the prior approval of archivists and/or managers.

TABLE 3
Summary of key points

	Prevailing research approaches	Complementary approaches we advocate
Theoretical approaches	Test theories that explain the development of relatively well-established industries.	Develop and test theories that explain the emergence of new industries.
	Study how industry emergence influences later stages of the industry life cycle.	Study what happens within the period of emergence and across multiple industry life cycles.
Methodological approaches	Study industry evolution by analyzing the entries and exits of producer firms.	Study industry evolution by analyzing the actions and interactions of various types of individual and organizational actors.
	Gather industry data from discrete historical sources or through field research.	Explore and exploit more fully the breadth and depth of industry records available in historical archives.
	Scan available sources of industry-level archival data.	Proactively intervene to help preserve and study the records of new industries before they are lost or dispersed.

FIGURE 1
Alternative temporal intervals associated with theories of industry emergence.

