Using Giddens' Structuration Theory to Inform Business History

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In considering the future of business history, scholars in the 1990s must respond to increasing calls in the field for stronger theoretical underpinnings. Over the last decade, panels at the Business History Conference (BHC) and in other special-purpose conferences and related books [e.g., Temin, 1991; Lamoreaux and Raff, 1995] have focused considerable attention on *economics* as a potential theoretical base for business history. Such an approach has been productive for some business historians; however, economics, with its narrow focus on the market and its assumption of independent, self-seeking rational actors, may seem unduly limiting to others. The potential contributions of non-economic theoretical perspectives to business history have occasionally been addressed in the business history community [e.g., Lipartito, 1995], but less frequently and with less sustained attention than the contributions of economics; other social science perspectives have been more visible in the history of technology, where the social construction of technology approach, for example, has achieved widespread popularity [Bijker et al., 1987; Bijker, 1995]. This paper suggests another non-economic (and, indeed, non-functionalist and non-positivist) theoretical perspective – structuration theory, developed by British social theorist Anthony Giddens – that may usefully inform business history.

Reading and understanding Giddens' social theory is notoriously difficult; both the theory itself and the language in which Giddens expresses it are relatively inaccessible. (Giddens himself comments that "'Structuration' is an unlovely term at best..." [Giddens, 1984, p. xvi].) Nevertheless, as I have struggled to understand this complex social theory (which I encountered in my non-historical research[1]) and have noted some of its extensions and applications to the study of contemporary organizations [Barley, 1986; Macintosh and Scapens, 1990, Orlikowski and Robey, 1991; Orlikowski, 1992;

[1] My own exposure to structuration theory is a product of my collaboration with MIT colleague Wanda Orlikowski in studying contemporary use of electronic communication media. She brought to our collaboration a profound knowledge of structuration theory, something I cannot pretend to have even now, after a series of jointly authored papers drawing on this theory [Yates and Orlikowski, 1992; Orlikowski and Yates, 1994; Orlikowski, Yates, Okamura, and Fujimoto, 1995].

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Whittington, 1992; DeSanctis and Poole, 1994], I have come to see it as an approach that is well suited to the historical enterprise in general, as well as to business history's interest in institutions. Moreover, it has the potential to provide theoretical grounding to the field, and, in the process, to highlight some previously underplayed aspects, reconcile some seemingly inconsistent findings, and provide new directions to my work as well as to the work of others in our field. Before demonstrating how it may inform the practice of business history, I will very briefly (and necessarily incompletely) introduce structuration.

Structuration is best viewed as a meta-theory or perspective on all human action, rather than as a theory pertaining to a specific domain or aspect of human activity. Unlike feminist or Marxist theory, for example, it does not point us towards particular content in our studies. It limits content only in its focus on the social, not the natural, sciences.[2] As structuration is explicated most completely in Giddens' *The Constitution of Society* [Giddens, 1984],[3] the theory begins from the premise that social science differs fundamentally from natural science:

> There are no universal laws in the social sciences, and there will not be any – not, first and foremost, because methods of empirical testing and validation are somehow inadequate but because, as I have pointed out, the causal conditions involved in generalizations about human social conduct are inherently unstable in respect of the very knowledge (or beliefs) that actors have about the circumstances of their own action [p. xxxii].

For Giddens, humans are "knowledgeable agents" operating in specific contexts, not just pawns of forces – whether economic or social – larger than they are.

In structuration, while social or organizational structures (which may include firm structure as a whole, as well as a department's authority structure, or the accounting structure, etc.) influence agents' actions, these structures do not exist independently of the agents. Rather, structures only exist as they are enacted by human agents, or, as Giddens puts it, "[t]he structural properties of social systems exist only in so far as forms of social conduct are reproduced chronically across time and space" [p. xxi]. The organization chart of a firm, for example, does not depict an independently existing firm structure. This structure exists only as human agents enact, and thus continually reinforce or reproduce, it by acting in accordance with the depicted structure (e.g., by reporting to the person above them in the chart). In this recursive relationship

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[2] Giddens' differentiation between natural and social sciences is not, as Scranton [1993, pp. 7-8] notes, based on an assumption that natural sciences are somehow more "objective" than social sciences; Giddens assumes that natural sciences, like social sciences, are interpretive, not "'theory-neutral.'" But social sciences, unlike natural sciences, must deal with the fact that humans are knowledgeable agents who can change their behavior.

[3] All references to and quotes from Giddens are from this work, and will be indicated in the text by bracketed page numbers only.

between people and structures, structures shape human action, which in turn constitute the structures, a relationship that Giddens terms the "duality of structure":

> The constitution of agents and structures are not two independently given sets of phenomena, a dualism, but represent a duality. According to the notion of the duality of structure, the structural properties of social systems are both medium and outcome of the practices they recursively organize [p. 25].

In this duality, structures comprise rules and resources which human agents draw on and reproduce as they act.

Understood in this way, structures both enable and constrain, but do not *determine*, human action. Human actors always have the ability or "power in the sense of transformative capacity," to act at odds with such structures, whether intentionally or unintentionally, and thus to undercut or even to initiate change in the structures [p. 15]. One person may act differently without initiating a change in the organization or institution, if others continue to act in the old pattern. If a person acts differently and if this other way of acting becomes institutionalized as a broader pattern (e.g., if one or more members of a firm begin to act in ways seemingly inconsistent with the existing organization chart but that are consistent over time), the new pattern has become the operating structure – that is, the structure has changed. This duality of structure, the central tenet of structuration, shifts emphasis away from social or organizational structures as fixed entities and towards structuring as a dynamic process necessarily involving individual actions.

There is much more to Giddens' theory than the duality of structure, but for now suffice it to say that structuration provides a way of thinking about individuals, organizations, and change over time that may inform our business history. Although it focuses on institutional reinforcement as well as change, it is in describing institutional change that structuration should offer business historians the greatest help. In providing his own reasons for turning to structuration theory to inform the history of technology, Philip Scranton notes that "Throughout his considerable opus, Giddens has sustained an explicit concern for historical dynamics and situated social relations as a means for making sense of modernity" [Scranton, p. 7]. Moreover, he notes that Giddens has synthesized useful elements from theories ranging from classical to postmodernist.

Structuration is not a positivist theory; thus, unlike economics, it does not provide causal models or hypotheses for us to support or refute, nor does it provide a recipe for research (a characteristic that some may find frustrating). In fact, Giddens argues that "the uncovering of generalizations is not the be-all and end-all of social theory" [p. xix]. At the same time that Giddens rejects a positivist stance, he also rejects a purely interpretive epistemological approach. While he acknowledges the significance of interpretive issues, which have a place in his theory, he notes more broadly that "concentration upon epistemological issues draws attention away from the more 'ontological' concerns of

social theory, and it is these upon which structuration theory primarily concentrates" [p. xx].[4]

If structuration is not any of these types of theories, what is it and why should business historians care about it? As I understand it, structuration is a theoretical stance for looking at human phenomena in the world – a way of understanding. Moreover, this way of understanding can help us address some of the tensions and difficulties that have bedeviled our field over the years, including the tensions between the history of great men and the history of institutions, between technological determinism and the social construction of technology, and between a firm-centered perspective and a broader social and cultural perspective in business history. As I address what structuration may bring to these three problem areas in what follows, I will draw on my previous and current research for examples, noting potential new directions and shifted emphases structuration might suggest.

Great Men vs. Institutions: Giddens and the Agency-Structure Duality

Giddens' theory can help business historians incorporate both individuals and institutions into coherent historical accounts. In its early days, business history reflected trends in history in general, focusing on individual businessmen[5] and, to a lesser extent, on the firms and organizations they founded [e.g., Nevins, 1953; Cochran, 1953]. Even Alfred D. Chandler, Jr., considered by many the founder of modern business history, wrote biography during his early career, although he eschewed robber barons for organization builders such as Pierre S. du Pont [Chandler & Salsbury, 1971]. Similarly, traditional history of technology tended to focus on individual inventors and their work. For example, the pioneering historian of technology Thomas P. Hughes began his career studying inventor Elmer Sperry [Hughes, 1971]; as David Hounshell has recently pointed out, "Despite Hughes's claim that 'Sperry made the transition from the era of heroic independent invention to that of organized research and development,' his interpretation of Sperry is weighted more heavily towards Sperry as an individual inventor (even within the Sperry organization) than towards Sperry's organization and how the organization *qua* organization innovated" [Hounshell, 1995, p. 207].

In the last few decades Chandler and Hughes, as well as many who came after them – business historians and sociologists alike [e.g., Noble, 1977; Fligstein, 1990; DiMaggio and Powell, 1991] – have shifted emphasis from great individuals to institutions and organizations. In *Scale and Scope* [Chandler, 1990], for example, Chandler focuses much more on trends within industries

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[4] Scranton [1993, p. 8], for example, argues that "Giddens develops an appreciative critique of post-modern and post-structuralist analyses that accepts the decentering of the subject, rejects dissociation and boundless slippages of meaning, and reaffirms the salience of positive and critical theory."

[5] I use the term "businessmen" advisedly, since the vast majority of this literature focused on men, not women.

than on the actions of individual managers, although individual actors never disappear from his stories. In his treatment of petroleum-related pollution, to choose an even clearer example, Joseph Pratt [1978] focuses almost exclusively on corporations, trade associations, and emerging public regulatory agencies, rather than on individual actors. While this institutional approach opened up many new and useful arenas of research, taken to an extreme it may yield institutional determinism, which reifies institutions (whether organizations or cultures) and portrays individuals as pawns at their mercy. For example, both engineers-turned-managers and workers in Noble's [1977] treatment of the rise of corporate capitalism often seem to act as undifferentiated extensions of the institutionalized structure of labor-management relations. Such a focus seems to discount or deny the role of individuals and their actions and choices in maintaining or undercutting an existing structure.

Giddens provides us with a way of understanding and incorporating the roles of both individuals and organizations into our historical accounts. In structuration, as noted earlier, organizational or institutional structures exist only as individuals enact them. These structures may be viewed as a set of resources and rules that individuals draw on to accomplish their daily work [pp. 17-25]. Thus the structures do not exist apart from human agents, who reinforce or, more rarely, undercut existing structures through their actions. Typically, individuals follow established routines of action, reproducing the existing organizational structures by acting (whether intentionally or unintentionally) in ways that reinforce those structures. For example, managers and workers around the turn of the twentieth century have most often acted in ways consistent with labor-management relations as this institution "existed" in rules and resources and as it was drawn upon by individuals, who produced and reproduced it, at that particular point in time and in the particular institutions. Such typical behavior may be viewed by some observers as supporting an institutional interpretation of history, one which assumes that institutions and their existing properties determine individual behavior. Such an interpretation, however, does not provide a clear mechanism for institutional change.

Giddens' theory, however, avoids institutional determinism and gains its dynamic aspect by recognizing that individuals have the ability to act in ways *other* than those that reinforce the existing social or organizational structure: "Agency concerns events of which an individual is the perpetrator, in the sense that the individual could, at any phase in a given sequence of conduct, have acted differently" [p. 9]. These individuals can make a difference, whether intentionally, often by drawing on an institutionalized structure from another realm of life (e.g., Quaker business owners who, in their treatment of workers, drew on religious structures as well as on labor-management structures common in business), or unintentionally, through slippage in daily practices (e.g., lower-level managers who forgot to write newly instituted reports). Individual divergence from what are perceived as legitimate organizational norms or structures can and often does result in sanctions or resistance (e.g., a worker can be fired for behaving in ways not in accordance with the existing abstract structure of institutional relations; a manager can encounter resistance to

introducing a new way of organizing work). One act outside of existing norms, whether intentional or unintentional, does not by itself change an existing structure (nor create a new one) if that structure continues to be enacted by other individuals. Nevertheless, if other individuals follow the lead of the individual acting outside of existing structural norms, whether in direct and explicit defiance of existing norms (e.g., as in collective action) or in tacit ways (e.g., as in worker "soldiering") they may together bring about change by reinforcing not the traditional mode of structuring work, but a new one. Methodologically, this structurational perspective suggests that the researcher look not just at the divergent action of a single person or type of person, but also at the mechanisms and other actors through which such an action may be reinforced and institutionalized, and thus the structure may be changed. Ongoing work practices, not just single events, are thus important to understanding change.

The preceding discussion raises issues of power, and Giddens' treatment of power in institutional relationships is particularly interesting. Unlike many critical theorists, Giddens does not see power as inherently conflictual, asymmetrical, or evil. In Giddens' words, "Power is not necessarily linked with conflict in the sense of either division of interest or active struggle, and power is not inherently oppressive" [p. 257]. Rather, he conceptualizes power as the "transformative capacity" of all individuals to act either to reinforce or to undercut existing structures. He does not ignore asymmetries of power, but neither does he reify them:

> Power within social systems which enjoy some continuity over time and space presumes regularized relations of autonomy and dependence between actors or collectivities in contexts of social interaction. But all forms of dependence offer some resources whereby those who are subordinate can influence the activities of their superiors. This is what I call the *dialectic of control* in social systems [p. 16].

Thus a manager cannot change existing structures single-handedly; workers must enact the new structure, as well. Similarly, an inventor does not change the standard way of organizing work in some industry by inventing a new technical device; only when others (investors, developers, customers, and users, including workers) also act in ways that reinforce first the development and then the use of such technology in a particular way does work organization change. This view of power can help us to avoid assuming a total lack of choice on the part of certain types of actors, such as workers.

Thus Giddens' duality of structure acknowledges that individuals typically draw on and act in accordance with institutional norms and structures, which shape their actions; however, the theory simultaneously recognizes the ability of individuals to act in ways at odds with existing institutional structures and, if others reinforce their actions, to modify these structures or create new ones over time. In his words, "All structural properties of social systems...are the medium and outcome of the contingently accomplished activities of

situated actors" [p. 191].[6] The relationship between structure and agency in structuration is a recursive and ongoing one that can allow business historians to incorporate both institutions and human actors into their accounts. Such a structurational approach is, in fact, ideal for the historian, since, as one commentator on Giddens notes, "the concept of agency cannot be fully elucidated apart from historically specific modes of activity" [Cohen, 1989, p. 29].

Let me take an example of how structuration can inform us from my own earlier work, *Control through Communication* [Yates, 1989], which was consistent in some ways with structuration theory, but was inconsistent or incomplete in others. In this work, I studied a set of changes in managerial ideology and practices, from the *ad hoc* management methods that dominated nineteenth century businesses to the more systematic, data-focused management methods more characteristic of the twentieth century. In general, my focus on the dynamic process of change in specific work practices[7] was very consistent with structuration as a meta-theory, although I could not then have articulated the importance of studying specific work practices as demonstrated in and by company records and contemporary accounts. In addition, I attempted to include the role of individuals as well as of institutionalized structures in my account.[8] On the other hand, in retrospect and in spite of my recognition that systematic management was an ideology[9] or belief system, my account was also rather functionalist (and thus at odds with the structurational perspective) in its justification of the adoption of systematic management as a *necessary* response to exogenous changes. These statements are, however, still too general to be of use in showing business historians how structuration might inform their work. Below, I will briefly trace the transitions to systematic management in two specific cases – those of Scovill Manufacturing Company and E. I. du Pont de Nemours and Company – then show in what ways my original account was consistent with structuration, in what ways it was inconsistent, and what gaps needed to be filled in the account.

Scovill's systematization was a gradual process in which a manager named John Goss played an important role. In the early years of the twentieth

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[6] Giddens quotes with approval Karl Marx's pithy statement of this philosophy [p. xxi]: "'Men...make history, but not in circumstances of their own choosing,'" while simultaneously rejecting Marxist teleology.

[7] These work practices included the genres of communication (e.g., the memo and report) used in firms. As I have since shown, the genres of communication I examined are also, in structurational terms, institutionalized social practices [Yates and Orlikowski, 1992].

[8] In fact, in my conclusion [Yates, 1989, 273-4] I highlighted the importance of key committed managers to the success of the changes, an emphasis that drew some questions and criticism from formal and informal reviewers of more functionalist or institutionalist orientations, particularly because of what was perceived as the potential bias in history towards great man interpretations [e.g., Sproull, 1990].

[9] I used ideology, here and elsewhere [Yates, 1994], in the sense of a coherent and often institutionalized belief system, whatever its content. Giddens [1984, p. 33] questions the use of ideology to refer only to "a particular 'type' of symbolic order or form of discourse," and claims that even science cannot be distinguished from ideological discourse. Nevertheless, he then drops the term, presumably to avoid its prevalent and politicized connotation.

century, John Goss entered the managerial ranks of Scovill, the firm of which his father was president. As the records reveal (both in the appearance of new types of documents and the occasional explanation in such documents of why they had been introduced and what Goss intended to use them for), Goss soon introduced into his small department new mechanisms such as downward written orders and standardized procedures, and systematic upward reporting flows to institutionalize new systematic management methods. As he gradually moved up the management hierarchy of the organization, he introduced similar procedures at each level. Around World War I, he became General Superintendent of the firm's production and mandated systematic reporting throughout.

In the years following the war, Goss hired E.H. Davis to create a Statistical Department to further systematize the reports. Davis' initial inventory of reports revealed that some, though certainly not all, of the reports placed on the books by John Goss were, in fact, not compiled and submitted at all. When questioned about these reports, those expected to generate them sometimes argued to Davis that the reports were not needed to guarantee that systematic procedures were followed, and in many such cases, John Goss authorized the official elimination of the reports, or their handling at lower levels in the hierarchy. Despite this evidence of at least some passive resistance, by the 1920s Scovill had work practices and norms that were relatively consistent with period writings on systematic management.

The transformation of work practices at Du Pont was more abrupt. Before 1902, the main Du Pont company was quite traditionally *ad hoc* in its management methods. The only evidence of new methods from the systematic management movement was in an off-shoot company, Repauno Chemical Company, founded by Lammot du Pont. In that firm, Lammot had introduced systematic reporting mechanisms and hired and trained other managers, such as Hamilton Barksdale, to believe in them and manage by them. In 1902, Pierre du Pont (the son of Lammot), who had been working at other, more systematized firms than Du Pont for the past several years, joined forces with his cousins to take over management of Du Pont itself. They consolidated Repauno and other financial holdings into Du Pont operations and put Hamilton Barksdale in charge of instituting systematic management methods in all of the powder plants owned by Du Pont, now consolidated into a Du Pont High Explosives Operating Department (HEOD). Barksdale, drawing on his previous experience at Repauno, instituted within the HEOD new procedures for written orders and operational reporting; to encourage the previously autonomous plant managers to adopt these procedures, he also established regular plant managers' meetings, initially monthly but later less frequently, in which he invited the plant managers to compare performance among plants on the basis of the new data now being collected. These meetings – originally held monthly but later held twice and finally once a year – were a mechanism for using peer pressure to encourage changes in the behavior of the plant managers. The plant managers gradually adopted Barksdale's new procedures, but not without grumbling, as is evident from their comments and questions as

reported in the proceedings of these meetings, as well as in cartoon caricatures of new procedures that appeared in their in-house HEOD magazine.

Both of these stories illustrate relatively successful introductions and institutionalizations of new types of work practices, and are in many, but not all, respects consistent with structuration, though some gaps remain to be filled. In both cases, for example, I focused on the actions of key individuals – John Goss, Pierre du Pont, and Hamilton Barksdale – in introducing new methods. Nevertheless, my account tended to be a functionalist one that interpreted the actions of these men primarily as rational reactions to similar circumstances. Structuration would not make that assumption, especially given my earlier discussion of the systematic management ideology. Moreover, the structurational perspective suggests the possibility, especially given the similarity of their rhetoric and actions to those of other managers of the era, that these individuals drew on institutional structures from other aspects of their lives in introducing the new practices. Indeed, I noted that Pierre du Pont was exposed to systematic management in other firms before he returned to Du Pont. Moreover, he relied on the experience and expertise Hamilton Barksdale had gained at Repauno to help him institute the new procedures. I did not, in this original work, examine the origins of John Goss' interest in systematic management, though later, prodded by questions about how the systematic management ideology was spread,[10] I returned to this issue, discovering evidence suggesting that he learned these new ideas (if not the specific techniques) while he was studying at Yale. In an autobiographical account of his own life, Goss described his knowledge of system as a product of his education [quoted in Yates, 1994, p. 42]:

> That was the first time it came to my attention forcefully that my college education had done me any good, because I discovered that there was a complete lack of system and I started in to try and see how I could introduce a little system into at least the immediate area in which I was working.

While the institutional power of these three key men was important, structuration suggests that they could not single-handedly change all practices and norms in their companies; they required others in the organization to enact the new practices and routines, including those involving mandated reports, in order to institutionalize the change over time. In this case, I provided at least some evidence of resistance to the new procedures in both firms, though my inclusion of this evidence was a product of accident in discovering it, not of a systematic search for the responses of those who had to enact new procedures. In the Scovill case study, I cited Davis' investigations showing that mandated reporting systems had not always been enacted, and thus had not been fully institutionalized as intended. In the Du Pont case, I noted that Hamilton

[10] I am indebted to Ken Lipartito in his comments at the Harvard Business History Seminar on an early version of Yates [1994] for pushing me to trace the origin of Goss's ideological belief in systematization.

Barksdale adopted the plant managers' meetings as a method of using peer pressure to reinforce his new procedures; although some resistance was present, as expressed indirectly in cartoons and directly in comments made in plant managers' meetings, most of the new procedures seem eventually to have been institutionalized.

While many aspects of *Control through Communication* are consistent with Giddens' theory of structuration, the theory suggests some others (e.g., the origins of Goss' knowledge of and belief in systematic management principles) that I initially left unexplored without it. The theory also highlights various elements that I may not have specifically sought nor adequately stressed in my original account, but that are important to a full story of change (e.g., the level of intentionality in the actions of Goss and Barksdale in introducing change; evidence of employee enactment of or resistance to the managerially mandated changes). A structurational view of social action would suggest, for example, that even where no sign of resistance is present, the business historian ought to consider not just the mandate of change, but its enactment by organization members, since it exists only in that enactment. Most importantly, however, informed by this meta-theory, I can now go beyond just telling a story to frame, in a theoretically knowledgeable way, a complex historical account involving both individual actors and organizational structures as they interact over time in ways that are not predetermined. The structurational perspective adds value by providing a framework that can help the business historian examine such stories of institutional change.

Technological Determinism, Social Construction, and the Duality of Technology

Secondly, structuration can help business historians understand the role of technology in history. Business history and the history of technology have both long been plagued by accusations of technological determinism – a tendency to see technology as, in essence, an independent variable that changes structures such as society, firms, and the organization of work [Smith and Marx, 1994; Hounshell, 1995]. In attempting to counter this determinism, whether "soft" or "hard," historians of technology have increasingly turned to the social construction of technology approach adapted from sociologists of science and presented in its fullest form in the well-known volume, *The Social Construction of Technological Systems*, edited by Wiebe Bijker, Thomas Hughes, and Trevor Pinch [1987]. This approach looks at technology within a social system that includes a variety of actors beyond the inventor, ranging from the relevant organizational networks to the society at large. Social constructionist accounts tend to see technology as a socially and materially constructed product of these networks and to focus on influences shaping the initial development and interpretation of technology, rather than on the influence of that technology's use on social structures. Social construction has provided a useful antidote to determinism; when taken to its extreme, however, this perspective has been accused by David Hounshell [1995, p. 214] of "hav[ing] slain the dragon of

technological determinism and hav[ing] rendered the field incapable of saying much more than 'all technology is socially constructed.'"[11] Again, structuration theory can help us bridge this divide and incorporate technology into our historical accounts in a way that acknowledges both social influences on technology and technology's influences on social institutions.

Giddens himself deals only briefly with technology, noting that "[t]echnological change is not something that occurs independently of the uses to which agents put technology, the characteristic modes of innovation, etc." [p. 178]. To see how structuration can help business historians deal with the problem of technological determinism, we must go beyond Giddens to those who have applied and extended his abstract theory to the particular domain of technology [e.g., Barley, 1986; DeSanctis and Poole, 1994]. I have found Orlikowski's application of structuration theory to technology to be most useful. She proposes that technology (especially information technology) "be considered as one kind of structural property of organizations developing and/or using technology. That is, technology embodies and hence is an instantiation of some of the rules and resources constituting the structure of an organization" [Orlikowski, 1992, p. 405]. Using this view of technology as a structural property, we can analytically isolate it to examine it more closely. In particular, she presents two useful notions that flow from this conception of technology: the *duality of technology* [Orlikowski, 1992] and the notion of *technology-in-use* [Orlikowski, 1995].

First, she argues that just as Giddens presented a recursive notion of organization (the duality of structure discussed above), we can also posit a recursive notion of technology – the duality of technology. She describes that duality as follows:

> That is, technology is physically constructed by actors working in a given social context, and technology is socially constructed by actors through the different meanings they attach to it and the various features they emphasize and use. However, it is also the case that once developed and deployed, technology tends to become reified and institutionalized, losing its connection with the human agents that constructed it or gave it meaning, and it appears to be part of the objective, structural properties of the organization [p. 406].

In spite of this tendency to become reified, however, Orlikowski's "structurational model of technology posits artifacts as potentially modifiable throughout their existence" [Orlikowski, 1992, p. 408]. Thus technology, like

[11] While I find Hounshell's statement eloquent and, in many cases, compelling, I'm not convinced that it is true of the Misa [1994] article to which he applies it. In that article, Misa seems to be arguing for rejecting the macro, institutional level of analysis *not* in favor of the micro level, but in favor of a "meso" level of analysis in between. Thus he seems to be trying to mediate between technological determinism and pure social construction, though in a slightly different way than I am attempting that task in this article.

other social structures, may be viewed as part of an ongoing recursive process by which human agents draw on a technology and thus constitute it in use:

> Agency and structure are not independent. It is the ongoing action of human agents in habitually drawing on a technology that objectifies and institutionalizes it. Thus, if agents changed the technology – physically or interpretively – every time they used it, it would not assume the stability and taken-for-grantedness that is necessary for institutionalization.

Studies of the design and development of technology [e.g., Bijker et al., 1987; Carlson, 1992], which are common in history of technology, focus on the first part of the recursive process involving technology: the social construction of the initial meaning and features of the technology. Once the material aspects of a technology have been stabilized, however, managers and users often settle into institutionalized interpretations and routinized uses of technology consistent with other institutionalized structures of the organization. Thus business history studies of organizations by which technology is used, particularly those not focused specifically on that technology use [e.g., Chandler, 1977], may tend to view technology as a stable, objective force that shapes other attributes of organizations. This tendency towards institutionalization in technology use, along with a tendency by business history scholars to focus elsewhere than on technology use, creates an opening for technological determinism. The notion of technological momentum put forward by historian of technology Thomas Hughes [1994] may also be seen as reflecting this common pattern of institutionalization after a certain point in time.

In the structurational view of technology, however, such institutionalization is never, to use Orlikowski's term, "inevitable." Individuals need not be cogs in the giant production machine. In their use of the technology, individuals may choose to undercut or modify, rather than reinforce, established interpretations and modes of use, although such modification is less common than during the technology's development. If their actions are reinforced by others in their ongoing use of it, new interpretations and uses of technology may emerge.

In fact, Orlikowski [1995] has proposed a distinction between technology as artifact (the material object and associated bundle of features and interpretations that emerges from the material and social construction of the technology) and technology-in-use (the material object and associated bundle of features and interpretations exhibited in the ongoing use of the technology by people within a particular context). Technology-in-use is a structure or set of rules and resources drawn on by individuals as they use the technological artifact, which, like other structures and like technology in its developmental stages, may be shaped and changed as well as institutionalized and routinized. For example, an automatic production line used to make automobiles may have been physically and socially constructed to be operated by a set of people with very limited and specialized jobs along that line, with the line intended to set the pace for the people working on it and with line-

stopping buttons only intended for use in emergencies. In an organization that shares that vision, it may be used with only minor variations, if any, from this vision. Within a very different organizational context that values team-work and that emphasizes quality, the same technological artifact may have a significantly modified meaning attributed to it and may be used quite differently. For example, individuals may be trained to perform several of the specialized jobs so teams can rotate jobs when desirable, and individuals may be encouraged to stop the line whenever necessary to correct any defects.

This structurational view of technology also helps us avoid a simplistic presentation of technology as inherently either good or bad. Like other structures, technology both constrains and enables. It constrains the range of actions likely to be used with it, but enables individuals to perform those actions, perhaps more readily than before. The structurational approach also highlights unintended consequences of technology implementation, since technology-in-use varies from one context and situation to another. Technology may be implemented by managers who seek a particular "impact" of the technology (e.g., increased efficiency), but it may have unintended consequences of various types (e.g., it may serve as a trigger for labor problems or for a negative interaction with other processes).

Let us now look at how this structurational understanding of technology can be used to illuminate some examples from my recent work on the interaction between the life insurance industry and the data processing industry, both in the pre-computer, tabulator era and in the adoption and use of the first generation of computer technology. In my study of the tabulator era [Yates, 1993], I observed what I called the "co-evolution of information technology and use."[12] In the first decades after Herman Hollerith introduced the first generation of tabulating technology for processing the 1890 U.S. Census, the executives of individual life insurance firms and leaders of life insurance professional associations such as the American Society of Actuaries showed great interest in the use of punched-card tabulating technology to help firms handle the large amounts of data needed in the growing and information-intensive industry. They interacted with the tabulating industry, shaping the technology and its use in life insurance firms.

Let us look at one such set of interactions in the second decade of the twentieth century. Early versions of Hollerith's tabulating technology offered faster sorting, counting, and adding of numerical data. This technology was of special interest to insurance actuaries because of their many calculations, but was also useful in sorting insurance records for routine processing. While the faster sorting and calculating capabilities of this early technology made certain

[12] Giddens objected to the use of the word "evolution," or what he called "evolutionism," because of its frequent use in biology to imply a positive developmental direction and to include such mechanisms as natural selection [pp. xxviii-xxix]. I attempted to use the term more neutrally, in a way that I do not believe conflicts with structuration theory. By co-evolution, I simply mean to highlight the change in both technology and use, in both vendor and user, over time and in interaction with each other.

repetitive tasks more rapid, the numbers counted or calculated showed only on dials on the tabulating equipment; operators had to record these numbers manually for further use, taking time and allowing for the introduction of mistakes. Many adding and bookkeeping machines of this era (most of which were used in insurance firms already) could print out numbers, rather than requiring manual recording. Thus insurance managers felt the lack of printing capabilities for the tabulating equipment and began requesting that the two firms manufacturing tabulating equipment (one run by Hollerith and the other by his rival James Powers) add this capability. Moreover, some insurance executives saw that it was in handling routine transactions (e.g., sorting out policies for claims or premium billing) and especially in creating routine transactional and reporting documents (e.g., premium bills and receipts, and routine reports of business by sales agent) now created using typewriters or addressing machines that such technology offered them the greatest potential productivity gains. Thus many individuals and organizations in the life insurance industry attempted to shape further development of the technology to provide printing capability.

Through hiring in-house inventors and supporting the one firm competing with Hollerith's (that of Powers), insurance firms maintained pressure on Hollerith and his successors to add such printing capabilities to the technology. Metropolitan Life, the largest insurance company in the world in the first half of the twentieth century, retained J. Royden Peirce as an in-house inventor to develop specialized punched-card equipment with printing capability for them. Peirce had a vision of equipment with alphabetical in addition to numerical printing capabilities to support an integrated set of insurance processes; unfortunately, while he could create a rough design for such equipment, he lacked the technical skills to oversee production of successful working machinery to accomplish his goals. Nevertheless, Metropolitan Life continued to support Peirce for many years, in great part because of one executive's strong belief in the need for such custom equipment, along with that man's ability to convince the relevant committee and top level executives to fund Peirce's development long after many other executives were complaining about the ongoing expense (ultimately $1 million) and minimal output.

This unsuccessful attempt at shaping technology development in-house had unintended consequences. For Metropolitan Life, it resulted in the loss of time and money while other firms were adopting working Powers or Hollerith equipment. Peirce's inability to produce working machinery, however, may have saved Metropolitan Life from compounding its problems by institutionalizing Peirce's special purpose machinery and cards (which were incompatible with the equipment of Powers and Hollerith) into their actual work practices, making their ultimate adoption of IBM tabulating equipment in the 1930s easier. For the tabulating industry as a whole, the failure of existing firms to gain the business of the world's largest life insurance firm kept pressure on the industry to develop the desired printing capabilities.

Meanwhile, U.S. insurance firms such as Travelers Insurance Company and Phoenix Life Insurance company shifted to Powers equipment around 1915, when Powers' firm became the first vendor to offer equipment with the

capability of printing numbers, putting further pressure on Thomas J. Watson, new manager of Hollerith's successor firm (at that point known as C-T-R but soon to become IBM) to develop printing capabilities for his own equipment. Watson and his firm could not immediately produce this capability to order, but after Watson invested in an experimental organizational unit, that unit succeeded by the early 1920s in developing a numerical printing feature, as well as some other new features, thus winning back a few of its insurance customers lost to Powers. Numerical printing eliminated the troublesome manual recording process and enabled users to print numerical internal reports with or without the use of forms if they wished. But to produce most of the routine transactional documents insurance firms depended on (e.g. premium bills and receipts), without extra steps involving typewriters or addressing machines, insurance managers still needed to be able to print alphabetical characters.

Around the same time, the British Prudential Life Assurance Company bought up the British agency of the Powers company and sent some personnel to the agency to work jointly with Powers' developers in producing the first working tabulating equipment with alphabetical printing capability. Again, IBM under Thomas J. Watson responded to competition by following suit; around the same time it introduced its 80-column card, which made IBM's equipment completely incompatible with its competitor's. By the 1930s, IBM had an 8 to 1 advantage in the market. Development of the technology continued, but in a more incremental fashion, with the addition of many special features.

So far, the story has focused primarily on the role of a set of individual and institutional actors (though structuration would never let us forget that institutions can only act through individuals) representing the large user industry of life insurance, on the physical and social construction of the technology. At the same time, however, as I attempted to suggest by the term "co-evolution," the shaping actions taken by individuals in life insurance firms simultaneously reflected their own use of this and other technologies. Informed by Orlikowski's structurational notion of the duality of technology, we can see that tabulating technology was initially interpreted by vendors and insurance managers alike as a way to subdivide and speed up individual, repetitive tasks of sorting, counting, and calculating. The process of subdividing and speeding up repetitive bureaucratic tasks had been going on in the insurance industry even before tabulating technology appeared, so the adoption of tabulating technology by insurance firms and its use in this way was an extension of existing organizational structures around technology and work practices. Either because I was not working from this theoretical base when I did this research or because the surviving evidence does not reveal much about this aspect of the story, the research did not yield insight into how individual operators felt about this extension of existing structures. If I had gone into the research with a structurational framework, I might have discovered more evidence of worker responses. Nevertheless, managers could draw on their existing institutionalized structures in introducing this technology and organizational methods of using it.

Over time, as they used the technology, insurance managers began to want to use it not simply for counting and calculating, but also for producing

the transactional and reporting documents central to the life insurance business at that time. The managers and representatives of insurance associations who acted in ways that directly or indirectly encouraged the development of printing capabilities in tabulating technology were acting based on existing institutionalized structures that depended on written documents such as internal reports, bills, and receipts. Still, perhaps because I did not focus on this aspect, I can provide no evidence of whether Peirce at Metropolitan Life (who had perhaps the most radically different, fully integrated vision of using technology to accomplish insurance functions) or insurance managers at other firms drew on existing institutional structures in developing their notions of how this technology could be used. Thus the story as developed in the earlier article is relatively consistent with a structurational view of technology, but still has gaps.

Extending that story past 1930 would show the influence of the next phase of the ongoing recursive interaction of technology and human use of that technology; here, we could focus on the technology-in-use after the establishment of what some scholars of innovation [e.g., Utterback, 1994] would call a "dominant design" for the technology – a general model of the artifact to which subsequent changes were incremental rather than radical. This next part of the story is suggested but not developed in my earlier paper and is developed only slightly in another paper [Yates, 1997]. Insurance use of the technology in the 1930s-50s highlights two different patterns: the establishment of routinized modes of use in many firms that could be interpreted from afar as institutionalized or even deterministic, as well as continued change in the technology-in-use in a few companies.

Most firms had incorporated large tabulator installations (predominantly IBM) into their work practices by the 1930s. Since the technology was initially socially constructed within the insurance industry as a way to speed up individual, repetitive tasks and to subdivide and departmentalize tasks, even with the added printing capability insurance use of the technology tended to be accompanied by further division of tasks. Meanwhile, IBM continued, under pressure from customers such as these life insurance firms, its incremental improvements to the technology in this later period (adding, for example, continuous forms printing, and automatic carriage control to allow a single punched card to print a three-line address). While most firms continued to use tabulating equipment to subdivide and specialize tasks, a small number of firms saw the potential to use the technology's existing and new capabilities to move toward a more integrated model of information processing for routine life insurance applications – a model envisioned (but not achieved) much earlier by Metropolitan Life's inventor, Peirce. This vision involved creating an initial set of cards for each policy, then running a series of applications (e.g., billing, creating receipts, issuing and servicing loans) all from those same cards, rather than continuing to separate those applications into different sets of cards and different departmental structures. Studies by two insurance associations show a couple of firms moving toward this model in the late 1930s, and an increasing percentage of firms (but still fewer than half) doing so by the early 1950s. While I did not look closely at any companies making that shift in this period, a

structurational perspective on technology would suggest that I should attempt to trace such changes to other institutional structures and to individual actions.

While most of my study of the interaction between life insurance and tabulating technology focused on the period during which social and material construction of the technology was occurring, subsequent research on the life insurance industry's transition from tabulating technology to early computer technology [Yates, 1996] may be used to better illustrate the influence of existing organizational structures on the adoption and use of technology. A few key individual and organizational agents in the life insurance industry contributed to the material and social construction of early computers as data and document processing, not just computational, devices, in a process similar to that observed in the earlier tabulator era. But what may be even more interesting from the structurational perspective is the influence of existing technological and bureaucratic structures on the adoption and use of early computers in life insurance firms.

Let me start a simplified summary of this part of the story at the point when the first computer is acquired by a commercial firm – Metropolitan Life.[13] In 1953 Metropolitan Life acquired a Univac computer from Remington Rand (the successor to IBM's rival, the company manufacturing Powers tabulating equipment). Two key executives from Metropolitan Life, Malvin Davis and John J. Finelli, had been part of a Society of Actuaries committee that performed extensive research in the late 1940s and early 1950s on potential insurance uses of the computer. This committee, led by Davis, recommended what it called the Consolidated Functions Plan for using the computer, a plan based on reorganizing internal processes and departments to integrate functions related to the same policy, as some firms had already begun to do with tabulating technology. When presenting the plan, Davis, Finelli, and the other committee members (who represented other firms as well) insisted that the real gains from the computer were not to be gained from any speed-up it offered, but from what Davis described as "a basic reengineering of present procedures" [Davis, 1953]. In spite of this emphasis on consolidating functions, Metropolitan Life's actual implementation of the computer by Davis, Finelli, and others was in the Actuarial Department, to be used for a single, separable application unrelated to the processing of specific policies. In various talks and papers, Finelli explained this decision on the basis of trying out the technology in a way that would not risk any breakdown in service to customers. Metropolitan Life soon purchased two additional Univacs, but again used them

[13]A structurational account of the earlier development of computers would, of course, note the fact that the two most significant early computer vendors are IBM and the Univac Division of Remington Rand, the firm that ultimately acquired Powers' tabulating firm, rather than new firms or even firms in the electronics sector. Thus institutionalized structures for dealing with customers of this type of technology seem to have been more critical to success than pure technical know-how. It is also interesting that Metropolitan Life, wary of repeating its past mistake with Peirce, had waited to get involved until a product existed, rather than trying to develop one in-house, reflecting the self-awareness of its executives and their desire to learn from previous mistakes.

initially to automate existing, departmentalized functions, leaving consolidation of functions to later stages.

Metropolitan Life's failure to follow the committee's recommendation is very understandable in structurational terms. In their study of potential computer use, Finelli, Davis, and other members of the committee were apparently influenced by each other and by the institutionalized structures and interpretations of the Society of Actuaries and of this committee in particular. In fact, one of the Univac representatives from this era was later to comment on the importance of this committee in shaping the concept of the computer as an important tool for the life insurance business as a whole (not just for actuaries) and as a document and data processing device, rather than solely as a computational device. In implementing and using the technology within Metropolitan Life, however, Davis and Finelli were also and perhaps even primarily influenced by the institutionalized structures characteristic of the firm itself and of its existing use and interpretation of tabulating technology. Thus they drew on existing rules and resources, which included an ingrained belief that relations with the insurance customers were not to be jeopardized, and an institutionalized task structure for tabulating technology-in-use that divided up functions rather than integrating them. While they had visualized the technology-in-use in one way when unconstrained (or at least less constrained) by the existing structures of their organization and its current installed technology, when they were again functioning within those structures, they made decisions consistent with the existing structures, including structures for tabulating technology, with its consequent rules and resources, constraints and enablements.

The influence of tabulating technology-in-use on the implementation of computer technology is even more obvious in the matter of 80-column punched-cards, the storage and processing medium used in existing tabulating technology. Although the Univac was designed to make use of a new medium, magnetic tape, people from the life insurance business who interacted with its creators made clear to the developers that they needed to develop card-to-tape *and* tape-to-card converters to allow firms to continue to use the familiar cards, at least as back-up to the unfamiliar tape [Yates, 1997]. Metropolitan Life, for example, had ordered with its Univac newly created peripherals allowing the conversion of IBM punched-cards to tape for processing, then tape back into cards for storage and back-up. As technology-in-use, then, the Univac at Metropolitan Life included both cards and tape. Most life insurance companies that purchased the Univac as their first computer, influenced by similar existing tabulating installations, also adopted such back-up procedures, at least initially.

This influence of the institutionalized structures of the tabulating era on the early computer era is also clear in the popularity of the IBM 650, that firm's early, small computer which was adopted in mass numbers by insurance firms [Yates, 1996]. This computer – a card input and output, magnetic-drum computer that was smaller and slower for number-crunching than the Univac or IBM's own larger 700 series computers – was popular with insurance firms for several reasons easily explicable in structurational terms. First, it could be incorporated into an existing tabulating installation, since it used the same

peripherals and the same card input and output. Consequently, it fit with current technology-in-use structures, rather than demanding massive change for implementation. Moreover, it was rented from and serviced by IBM, thus fitting into existing financial and servicing structures in firms. In essence, it provided insurance executives with an incremental migration path into the computer era by allowing them to draw on existing rules and resources, rather than immediately demanding new ones. It could be adopted with minimal changes to existing organizational and technological structures.

Because this part of the story so far has emphasized the influence of existing organizational and technological structures, let me close this section by examining how structuration can help business historians avoid technological determinism and go beyond social construction by an example that emphasizes the potential for acting differently that always exists within the duality of structure and the duality of technology. The second life insurance firm to buy a Univac computer (also in 1953) was Franklin Life, a medium-sized firm with roughly 1% the number of policies held by Metropolitan Life [Yates, 1996]. This second firm was growing several times faster than the industry as a whole and bought its first computer to slow its hiring, in part to avoid (or at least postpone) having to build a new building to house its rapidly growing staff. Unlike Metropolitan Life, which was so large that speeding up individual actuarial applications took the entire capacity of a Univac and also produced savings within a short time period, Franklin Life executives could not justify the purchase of a Univac without using it for multiple applications. Still, that firm could have used the computer for multiple, separate applications; instead, it implemented a consolidated functions plan similar to the one recommended by the Society of Actuaries committee. Moreover, its technology-in-use eliminated all cards, even for back-up, using magnetic tape as the sole medium for storage and processing. Although my research has not yet produced unpublished sources to illuminate the internal decision processes, the outcome makes clear that individuals within the firm were willing to challenge and rethink existing organizational and technological structures, rather than drawing on them. This example again highlights a key premise of structuration: while influenced by existing structures, individuals can always act otherwise, sometimes leading to change in those structures. Primary source research might also look for other institutionalized structures Franklin's executives might have been drawing upon in their decision to use the technology to integrate functions (these institutionalized structures are likely, but not required, to exist). Such decisions happen in the adoption and use of technology, as well as in other aspects of organizational change.

The Internalist Firm Perspective vs. Social History: Pluralism of Structures

A third tension in business history that structuration can help us deal with is that between the internalist firm perspective and the broader social history perspective. As Louis Galambos [1991, p. 6] has noted of Chandler and

those he inspired, "he narrowed the scope of business history while greatly increasing its analytical depth and intellectual significance." Recently, Galambos and others have challenged this narrow scope and asked for the integration of political and social history with business history. The social constructionist approach to the history of technology, for example, has moved well beyond the inventor, often focusing broadly on consumers and society [e.g., Bijker, Hughes and Pinch, 1987]. Moreover, social perspectives based on gender, ethnicity, and class have also begun to appear in the history of business [e.g., Kwolek-Folland, 1994; Levinstein, 1995]. But how do we combine and balance, in our historical accounts, the firm and the role of the manager with these broader social and political concerns? This is certainly an area in which I feel the need of theoretical and practical aid, since I have consistently followed the internalist, Chandlerian approach.

Recently Richard Whittington [1992] has suggested how Giddens' structurational framework can help scholars to accomplish this balancing act in contemporary (rather than historical) management studies. He notes that most uses of structuration in management studies have focused on the manager within the firm, ignoring larger social forces. He also notes, however, that this use of Giddens' theory is only partial, since Giddens himself sees individual human actors as members of and operating in multiple social systems and structures. Giddens tells us that in acting, individuals may draw upon more than one set of structures, with their corresponding rules and resources [pp. 162-226]. They can certainly draw on the structures of their firms, but they can also turn, to cite just a few of the possibilities, to those of professions, of non-voluntary and voluntary social groups (e.g., gender and religion) to which they belong, and of national cultures in their actions. While such a multiplicity of structures can result in contradictions, it can also aid in initiating or supporting change. An individual may draw on the rules and resources of one of those structures, rather than of a structure institutionalized within the specific firm. (Indeed, I have already mentioned two such examples: John Goss of Scovill and Hamilton Barksdale of Du Pont both drew on structures outside their companies in introducing new systematic management techniques.) These other structures may also be a basis for support in changing a firm-based structure, since, for example, colleagues in the firm may also share structures of the profession or of a religion. Whittington sees this notion of drawing on multiple structures as a way to mediate between managerial agency and broader but often deterministic concerns of institutionalists.

This same recognition that individuals in business are influenced by multiple social structures inside and outside of the firm may also be useful to business historians trying to integrate social concerns into their studies. If we adopt this pluralistic view of structures, we can see actions within the firm in a much broader context without losing sight of individual agency. Here, rather than illustrating from work I have already done, I will illustrate how this point of view could help me transcend firm boundaries in my ongoing work on life insurance and computerization by taking into account structures in the

following areas: government regulation, professional and trade associations, legal organization and industry culture, and the labor market.

Insurance firms are regulated by the states (not by the federal government) on such matters as reporting requirements and the level of reserves maintained in comparison to the value of policies in force. Thus insurance firms were affected by the regulatory legislation and requirements of every state in which they operated (for the large companies, generally all of the states). These firms could also lobby state legislatures and the National Association of Insurance Commissioners (through which state insurance commissioners cooperated to reduce variation across state regulations and to agree on standard forms of reporting when possible [Buley, 1953]) in order to shape the regulations that affected them. Since one function of insurance data processing is to make and report the required calculations for the firm, I should investigate these regulatory structures as well as firm and industry attempts to lobby relevant bodies, attempting to understand the potential influence of these structures on executives making decisions on data processing technology.

Professional and trade associations in the life insurance industry provided another set of structures relevant to insurance managers in the early computer era when they were interacting extensively with data processing equipment vendors. Conference proceedings from meetings of the Society of Actuaries, the Insurance Accounting and Statistical Association, and the Life Office Management Association make clear that insurance firms shared considerable information about the new computing technologies and their uses of them [Yates, 1996]. Committees of such organizations also spoke for the insurance industry in interactions with equipment vendors. In presenting parts of this research, I have been asked several times why insurance firms were generally so willing to share such information with each other, rather than attempting to keep it secret in order to attain competitive advantage.[14] Individual managers sharing information about computers across firm boundaries could have been drawing on the structures related to these professional and trade associations, as well as to the specific firms. To construct a structurational account that responds to Whittington's exhortation for scholars to go beyond internal firm structures, I should examine these associations and the attitudes and norms around them more carefully to see how they influenced individual actors and structures within specific firms, particularly with regard to information sharing about information technology.

Other structures may also be relevant to the issue of sharing information versus hoarding it to gain a competitive advantage. The New York State Legislature's Armstrong Commission hearings of 1905, which looked into widespread corruption in the life insurance industry and set the standard for regulation in the future, was a watershed event in the U.S. life insurance industry [Keller, 1963]. In the wake of these hearings, many insurance firms

[14] For example, Louis Galambos raised this issue when I presented related material at the Hagley Museum and Library's Center for History, Technology, and Society seminar in April, 1995.

converted from stock companies to mutuals, in which any "profits" are distributed to policy-holders in the form of dividends. The form of legal organization (stock vs. mutual) might affect firm willingness to share information, though such an explanation can be made solely in economic terms, without resort to other structures. Although this notion bears further investigation for the early computer era, I found that it did not play a significant role in the tabulator era. Based on a few examples from the later era, however, I suspect that a fruitful avenue of inquiry is the new identity and culture that emerged in insurance firms in reaction to the Armstrong Commission hearings. In many cases, managers and employees came to see their insurance firms not as corrupt organizations seeking maximum profits but as quasi-public institutions that served their policy holders. This institutionalized cultural identity, along with professional and trade association identifications crossing firm boundaries, may have yielded structures that insurance executives drew on in decisions about information sharing.

Finally, a structurational approach would suggest that I look not just at those executives who made decisions to acquire computing technology, but also at the responses of insurance workers to its introduction. In this case, another set of structures, the post-war labor market in the U.S., seems to have played a role in why and how computer technology was adopted and used by insurance firms, an area that I need to investigate more thoroughly. After the war the U.S. emerged into a period of prosperity and growth, and sales of life insurance, seen as one mechanism available to help individuals attain and preserve the American Dream, grew even more rapidly. This sales growth fueled rapid expansion in life insurance and a labor shortage of people to work in the insurance firms. Thus the computer was introduced into firms by insurance executives at a time of such rapid growth that the computers did not displace people, but simply slowed the rate of employment growth in that industry [U.S. Department of Labor, 1955]. The structure of the labor market in insurance no doubt influenced the responses of insurance workers to the introduction of this new technology by executives, increasing workers' willingness to accept the technology and enact new structures around the technology (e.g., to construct a new technology-in-use) and lessening the probability of resistance to it.

These areas for future work would allow me to take into account broader societal structures as well as firm structures, while still keeping action in the domain of the individual. Thus if we take seriously Giddens' position on the pluralism of social structures and their influences on individual actions, we can set a more ambitious agenda for business history. Of course, these avenues of exploration do not require structuration; nevertheless, a structurational framework highlights new research directions and levels of analysis, while

offering a way of integrating these levels through a focus on individual action as it is influenced by various structures.[15]

Conclusion

As we contemplate the future of business history, we need to explore new theoretical bases for business history, and to go beyond one such base, economics, to the wide range of social theory available. This paper has attempted to suggest some of the ways in which Giddens' social theory, structuration, can inform business history. It can provide a framework that allows us to incorporate individuals as well as institutional structures into our analyses. Using it, we can attempt to navigate the narrow straits between technological determinism and a form of social construction that provides little analytic power. We can look at technology-in-use, as well as technology as socially constructed or technology as an independent variable. Finally, we can use structuration as an analytic framework for incorporating the influences of plural institutional structures while never losing sight of the individual actors.

Structuration is a perspective, a meta-theory, rather than a domain-specific theory that can be proved or disproved. As a non-positivist social theory, it is also not intended to generate testable hypotheses. It focuses our attention and our questions as we engage in business history, but does not give us specific answers to these questions. Rather than focusing us on impersonal forces of supply and demand, as economics does, it focuses us on human actors shaping and being shaped by social structures specific to a time and place. Moreover, by drawing on Giddens' theoretical framework, we can address a series of issues that have caused trouble for business history, in a way that allows us to incorporate broader historical concerns into our business history. Consequently, I put it forward as a theory that may inform us in the practice of business history as we approach a new century.

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[15] My argument resembles that of Misa [1994] in trying to mediate between levels of analysis, but using structuration theory, I attempt to achieve that mediation in a different way. The micro level as represented by individual action is never eliminated, but it is looked at in the context of structural influences inside the firm, in professions, in national governments, etc.

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