How the Future Shaped the Past: The Case of the Cashless Society

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The future matters to business history, because the adoption of new technology and new organizational forms has often been driven by acceptance of a collective sense of what the future will be. Investments are made and strategies set on an industry-wide basis, influenced by the predictions of business consultants, industry groups, and futurists. To explore the part played by the future in shaping the past, we focus on the establishment and early acceptance of the idea of a rapid and inevitable transition to a "cashless society" in the US retail financial services industry during the 1960s and 1970s. Our aim is thus to advance a methodological point rather than to arrive at a definitive conclusion about the future of money.

. . . we shall see the beginnings of a cashless society. But at what point? My aim has been to try to attempt to predict the future, not to justify it. (R. S. Sayers, 1965)[1]

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1. Sayers, "Computers and Money," 13–15.

Introduction

Historians study the past. We try to understand events that have already taken place in their appropriate historical contexts and are rightfully wary of the danger that "presentism" will distort our analysis. In contrast, most people care primarily about the future. After giving a talk to a general audience, historians are used to being asked only about the implications of our work for the future. We tend to be reluctant to answer with tangible predictions knowing from our workaday immersion in the materials of the past that predictions are almost invariably wrong. So historians leave the future to others, whereas every business decision has a past, present, and future.[2]

The danger here is that, by discounting this general fascination with the future, historians may fail to appreciate the extent to which organizational adoption of technology, and particularly information technology, was based as much on imagined futures as it was on existing realities. The argument for business adoption of new technology has generally been made in the future tense. From the 1950s onward, technology companies, experts, consultants, and business professors have sold new technologies to enterprises by telling elaborate stories of a future world transformed by universal adoption of technology. The visions evoked by these stories were shaped and accepted not just individually but also collectively, by industries and occupations.

We are interested here in the career of one particular futuristic vision: that development in automation and computer technology will usher in a "cashless society" in which all transactions are processed electronically without any use of paper money or checks. The idea originated in the 1950s but has remained curiously popular, enjoying a new upsurge of ubiquity within the last few years.[3] We explore its emergence, including early conflicts, to define the concept when trying to apply it in commercial banking. To get a sense of

2. In an independent effort, Lisa Jack has also documented a case in Australia to illustrate the issue of time-space in researching business and accounting history. See further Jack, "Future Making in Farm Management Accounting."

3. A brief example to illustrate the variations in the use of the term "cashless society" can be found by searching Google's library of digitalized books (Google's Ngram Viewer). This search suggests that "cashless society" appeared in 1959, peaked at 2.00E-08 of all English books in 1973 and oscillated between that peak and 1.00E-08 until 2008. Whereas "electronic payments" appeared in 1962, peaked at 4.00E-08 in 2000 and remained well above 3.50E-08 thereafter until 2008. One can only speculate the reasons for this behavior but, perhaps, the negative connotations of "cashless" has limited its use; whereas "electronic" has a more modern, forward-looking ring to it.

the power and limitations of the shared vision as a guide to action, we conclude with a brief examination of a failed effort by the VISA organization to deploy a comprehensive payments product in the early 1970s.

To talk of "shared vision" might seem strange here, as in business the word "visionary" is often reserved for leaders who claim to see what others do not; hence, vision could be seen as something personal rather than collective. Likewise "vision" might also be understood by some to imply specificity and precision, although religious visions are often dreamlike. The term that best captures our meaning is "imaginaire" (or "sociotechnical imaginaire"), increasingly used in science and technology studies. The imaginaire is an imagined new social order understood as the natural result of adopting an emerging, unproven technology. The evolution of the technology and its mode of application are, in turn, reshaped by this collective sense of the future as it becomes ingrained, sometimes on a subconscious level, within a community. The most striking example, studied by Patrice Flichy, is that of *The Internet Imaginaire*.[4] Flichy defines the imaginaire as a "collective vision" and ties the concept closely to utopian thought, arguing that over time a utopian fantasy is transformed though experimentation and the application of specific technologies into an ideology that directs change in the real world. In the remainder of this paper, and at the risk of being judged pretentious, we therefore use the term imaginaire rather than vision.

When particular technologies failed to perform as expected, this could be characterized as a bump in the road to the imaginaire, rather than as a challenge to the inevitability of arriving at the agreed destination. Once consensus on the destination was reached, a variety of specific systems or approaches could be presented as a step toward realizing this future goal, making "the checkless/cashless future" a banner around which a heterogeneous alliance of interests could gather. This, of course, would further strengthen the power of the imaginaire itself. The cashless society imaginaire has retained its allure over more than four decades despite the failure of initiative after initiative aiming to eliminate cash transactions.

Successful innovation, therefore, depends, implicitly at least, on convincing others of the existence of a future in which the innovation is accepted. This concept aligns well with a body of literature relatively familiar to business historians, the "New Institutionalism" research on organizational form. In a seminal article, Paul J. DiMaggio and Walter M. Powell explored the processes by which organizations in a particular field tend to grow more and more alike, which they

4. For example, Flichy, *The Internet Imaginaire*.

dubbed "institutional isomorphism." This, they argued, reflected not just a set of independent and rational competitive responses to a changing environment but also a cultural process by which a consensus on the appropriate and legitimate institutional form is established within a particular organizational field.

Institutional isomorphism is important here because it explains how acceptance of an idea, about the proper structure or activities of a class of organizations, can exert a direct influence over the actions taken in specific organizational instances—regardless of any direct economic or practical benefit it might hold for them. Once a new organizational feature (e.g., establishing a personnel department) becomes sufficiently well established, any firm that does not adopt it will appear old-fashioned or backward and sacrifice legitimacy with peers, customers, and employees. DiMaggio and Powell identified three mechanisms for this change: coercive (e.g., from external standards and regulations), mimetic (copying the reactions of peer institutions to environmental uncertainty), and normative (stemming, they believed, primarily from professionalization).[5] We suggest that mimetic isomorphism is the result not just of organizations copying the innovations of their more successful peers but also by the acceptance within an organizational field of a consensus on the inevitable future direction of that field. Organizations failing to adopt new technologies or restructure themselves in response to this forward-looking consensus will pay a real and immediate price in terms of lost legitimacy, regardless of what actually takes place in five or ten years time. We also believe that normative isomorphism, which according to DiMaggio and Powell is driven by the agendas of professional and occupational groups, will often reflect these shared visions of the future.

We should acknowledge at this point that the future has not been ignored by scholars of business and economics. Future expectations are fundamental to economic theory, guiding investment decisions and underlying formal mechanisms such as the calculation of net present value. Walter Friedman has explored the history of Harvard's pioneering economic forecasting service[6] and written a biography of the twentieth-century economist Irving Fisher, who frequently stressed the importance of future expectations to business people. Says Friedman: "More than any other economist of his time, Fisher saw that a future-orientation among businesspeople and entrepreneurs was at the very core of business, and even more broadly, of capitalism."[7] In a similar vein, Carol Connell tells of Fritz Machlup's

5. DiMaggio and Powell, "The Iron Cage Revisited."

6. Friedman, "The Harvard Economic Service and the Problems of Forecasting."

7. Friedman, "Irving Fisher, Economic Forecasting and the Myth of the Business Cycle."

successful efforts to introduce scenario analysis as a method for collaboratively exploring alternative futures by senior teams in government and corporations.[8] The future is also part and parcel of the (contested) discourse in corporate strategy. In this regard, Kenneth Andrews noted: "As its meaning has dispersed throughout recent usage, the word strategy still retains a close connection to a conscious purpose and implies a time dimension reaching into the future."[9] Usually, however, economic futures are presented quantitatively, as a set of numbers extrapolating current trends. The power of the imaginaire lies precisely in its suggestion that a radical, qualitative break from the past is coming, creating a new world in which everything will be different.

Origins of the Cashless/Checkless Imaginaire

Perhaps the most striking thing about the cashless society imaginaire is its insistence on defining the future not by what it will contain but by what it will *not* contain: cash. It was also explicitly a vision of a new society, rather than a description of a specific new technology by which that society would be created. This negative definition proved more popular and enduring than more specific and prosaic alternatives focused on technologies the future *would* contain, such as the later "Electronic Funds Transfer At Point of Sale" (EFTPOS), or possible alternative names for the new world such as "electronic payments society." Its enduring success suggests that it is easier to build a broad coalition around a collective vision of what the future will *not* contain rather than what it will contain.

Money has a long history and has inspired a rich historical literature. The relationship of economic value to particular physical embodiments has sometimes been a topic of huge political importance in the United States, evidenced by the creation and destruction of its First and Second National Banks, populist enthusiasm for bimetallism in the late nineteenth century, and the insertion into the 2012 Republican Party platform of a pledge to establish a commission to examine ways to fix the value of the dollar against a new gold standard.

The cashless society imaginaire has been largely separate from these debates, primarily because it did not concern money or a particular currency unit itself. The historical figures we are studying were not motivated by economic ideas about containing inflation or

8. Connell, "Reforming the World Monetary System."
9. Andrews, *The Concept of Strategy*.

stimulating the economy through manipulating the money supply. Instead their interest was with the *mechanisms* that allow a society to *exchange* money. Their drive to eliminate cash and replace it with electronic payments could and did create anxiety amongst politicians and the general public, but within the banking industry, people were focused more on how these changes might contain the costs of processing paper-based payments (including fraud).

Bankers had long been sensitive to the costs involved in cash transactions. One issue was what Sargent and Valde call the "big problem of small change" in cash payments.[10] Until this was resolved in the nineteenth century, there was probably a great deal of use of what Parker called "bookkeeping barter."[11] Cash also had limitations for large transactions and those conducted at a distance, so by end of the eighteenth century the use of paper checks was growing rapidly and letters of credit became popular in domestic and international trade.[12] Alternatives to the check-clearing system operated by the major commercial banks soon appeared in many European countries.

Variants of the cashless society imaginaire began to appear throughout the developed world during the second half of the twentieth century. They involved eliminating cash even for the kinds of transaction in which it had previously seemed irreplaceable: small, spontaneous purchases made in person by consumers. The replacement would be some kind of electronic payment system which, because of the speed and efficiency made possible by automation, could replace all forms of paper-based payment instruments: both cash and checks.

Like most radical ideas, this was justified as the natural solution to an urgent crisis, though that crisis was detected first in the handling of paper checks and only later in the costs associated with paper currency. The growing popularity of payment by check was highlighting its limitations as a substitute for cash. In the mid-twentieth century, all checks written in the United States had to be physically sorted, routed, and delivered to the issuing branch before the check was settled and final payment made.[13] This process incurred not only significant handling and transportation costs (estimated at $3.5 billion per year in 1967) but also "float" costs for the depositing institution until

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10. Sargent and Velde, *The Big Problem of Small Change*.

11. Parker, "Bookkeeping Barter and Current Cash Equivalents in Early New South Wales." Note that there is no evidence supporting the idea that a barter economy ever existed. Instead, there seems to be a gradual development of trade and record keeping leading to the development of coinage in ancient societies, which later on "dematerializes" again during the middle ages. See, for instance, Hudson, "The Role of Accounting in Civilization's Economic Takeoff."

12. Kim, "How Modern Banking Originated."

13. This remained true until 2003, with the passage of the "Check 21" act.

settlement was received.[14] Over the decade prior to 1955, the volume of checks processed annually by the Federal Reserve rose from 14 billion in 1955 to nearly 22 billion (about 60 million each day), and the projected rate of growth for the next decade was even higher.[15] Even with the introduction of computer systems based around magnetic ink character recognition (MICR) and high-speed check sorters, this posed a substantial logistical challenge and imposed an appreciable expense. Handling costs are per-check, but float expenses are per-dollar, so any increases in volume, or delays in clearing, would further increase banks' costs.[16]

Banks on both sides of the Atlantic began to adopt computers and telecommunications starting in the 1950s. As early as 1954 a report published by the Dynamic Analysis and Control Laboratory at MIT explored the possibilities of replacing cumbersome, costly, and easily forged paper checks with sleek, efficient, and safe electronic messages.[17] Once the major banks digitized their accounts, the report argued, it would be relatively simple to connect their computers over a telecommunications network and process most routine payments entirely in electronic form. The laboratory was a spin-off from MIT's famous Servomechanisms Laboratory, responsible primarily for the development of missile guidance systems. During this era several groups within MIT were promoting the transformative power of computers, cybernetics, and forecasting in a variety of domains in an attempt to interest different funding bodies in supporting their work.

14. While the check passed through the clearing system, which could take several days, the depositing institution had to pay interest on the deposited funds and often make some portion of those funds available to the depositor, even though the depositing bank would not receive payment from the check issuer until the clearing process was complete. See Lee, "Tomorrow's Checkless, Cashless Society."

15. Another contemporary study estimated a similar trend but of different magnitude as it stated that approximately one-and-a-half billion checks were cleared in the United States in 1939, and this volume increased to 6.5 billion in 1950 and to 13 billion in 1960 (Yavitz, *Automation in Commercial Banking*). Both these estimates concur in identifying a spectacular rise in check volume and activity, with no corresponding increase in the value of deposits, thus placing a severe strain on the US banking system.

16. These costs were also more pronounced in the United States than in other countries due to several reasons. These included the sheer number of banks. In 1966 there were 14,000 banks in the nation, so the likelihood that a check needed to go through the national clearing system was higher than in countries with fewer banks per capita. Another reason was that the use of personal checks in the United States was much higher than in other countries. In Spain, for instance, their penetration as a means of payment remained negligible even after the introduction of check guarantee cards in 1971 (see further Bátiz-Lazo and Maixé-Altés, "Managing Technological Change by Committee").

17. See Gregory and Herbert, "A Study of the Transfer of Credit in Relation to the Banking System."

This concept moved from the speculative fringe into the mainstream of the banking and computing industries in the mid-1960s. The two came together in 1965 when Thomas J. Watson, Jr., IBM's chief executive, addressed the National Automation Conference of the American Bankers Association. IBM had recently launched its ambitious System 360 line of computers and peripherals and was eager to push its products and services beyond traditional administrative data processing applications, encouraging the construction of real-time interactive applications. Watson defended automation against growing public concern over the threat of technological unemployment, concluding with the promise that

> in banking . . . the advances of yesterday are merely a faint prologue to the marvels of tomorrow. In our lifetime we may see electronic transactions virtually eliminate the need for cash. Giant computer banks, with massive memories, will contain individual customer accounts. To draw down or add to his balance, the customer in a store, office, or filling station will do two things: insert an identification into the terminal located there; punch out the transaction figures on the terminal's keyboard. Instantaneously, the amount he punches out will move out of his account and enter another.
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> Consider the same process repeated thousands, hundreds of thousands, millions of times each day; billions upon billions of dollars changing hands without the use of one pen, one piece of paper, one check, or one green dollar bill. Finally, consider the extension of such a network of terminals and memories—an extension across city and state lines, spanning our whole country . . . [T]he steep acceleration of technology in our time has set this prospect in clear and sharp outline on the horizon.[18]

Watson sketched the cashless society as a technological possibility, indeed a technological inevitability, but articulated neither a clear nor an urgent reason for bankers to invest in this technology. Three other men were particularly important in constructing what became accepted as the primary and urgent reason for moving toward a "checkless/cashless society": a looming crisis in transaction volume that could be solved only by eliminating the paper from the system. The first was John Diebold, who had earlier popularized the term "automation." His consulting firm, The Diebold Group, constructed several networked computer systems for commercial banks in the early 1960s and was promoting more radical kinds of banking automation by the mid-1960s.[19] Diebold himself wrote articles in leading

18. Watson, "Man and Machines—the Dynamic Alliance."
19. Diebold Group, "Summary Report."

business journals, warning of an impending "transaction overload" and stating that "the 'cashless society' is no longer an option but a necessity. . . ."[20] Although he acknowledged that there was "considerable vagueness" surrounding the actual details of how such a society might be achieved, he nevertheless argued that "some system must and will develop in which money (and credit) moves quickly and safely" around the world. Diebold's role as a would-be prophet helped to pioneer what became an established pattern in the consulting industry. Neil Pollock and Robin Williams have documented the role of industry analysts, such as the Gartner Group, in shaping the adoption of technology.[21] They categorized these "intermediaries specializing in the production, commodification and selling of future oriented knowledge" as "promissory organizations."[22]

During the 1960s, Robert V. Head was one of the most prominent experts on management information systems and the application of real-time computer technologies to business and a frequent contributor to *Datamation*, the leading trade publication in the computer field. He spent several years working on banking applications and issued a pamphlet entitled "Automatic Credit Transfer System: Emergence of the Checkless Society" in 1965.[23] He promoted the same idea in a 1966 *Datamation* article "The Checkless Society."[24] Head used the power of the emerging imaginaire to delegitimate the sudden rush of banks to issue conventional credit cards, writing that "bank credit card ventures must be viewed more as ill-advised retrogressions rather than as imaginative breakthroughs into the checkless future." By 1966 the American Management Association had adopted the hybrid phrase "checkless-cashless society" in its discussion of electronic payments. In 1980, it promised, both would be almost entirely replaced by plastic payment cards and computer terminals exchanging funds in real time.[25]

20. Diebold, "When Money Grows in Computers."

21. Pollock and Williams, "The Business of Expectations."

22. Management consultants have proven important in the diffusion of fads and novelty within managerial discourse. They have also been identified as key forces in the propagation of new technologies within business, a process documented by Brian P. Bloomfield and Theo Vurdbukais who argue that building a showcase facility demonstrating the retail world of the future allowed one major firm to construct both "expert knowledge and client ignorance" to promote its services. See Bloomfield and Vurdubakis, "The Vision Thing." Managers use narratives about new and fashionable techniques to communicate to organizational stakeholders that their organizations conform to institutional norms mandating the use of these techniques. This can explain the diffusion of management techniques across thousands of dissimilar organizations. See Flichy, *The Internet Imaginaire*.

23. This source appears in Head's 1966 article in *Datamation* (below). We were unable to locate it.

24. Head, "The Checkless Society."

25. Anderson et al., "An Electronic Cash and Credit System."

This nascent imaginaire also won influential support from George Mitchell, a member of the Board of Governors of the Federal Reserve, who began warning bankers in 1966 about paper check processing's increasing costs. He implored the banking industry to consider how "the computer can drastically change money and its use."[26] Electronic payments, he argued, would reduce both the handling and float costs, as transfers could be achieved nearly instantaneously. He predicted that the use of checks would disappear within "the discernable future, probably much sooner than most of us expect" and that paper notes and coins would be relegated to increasingly limited uses.[27]

As the declarations quoted above suggest, the transition to a cashless society was usually understood as also requiring the elimination of checks even though these were the best established alternative to cash in the 1960s and 1970s. We believe that references to the "checkless society" or "checkless/cashless society"[28] did not correspond to systematic differences in meaning but were different names for the same imaginaire. The point was to remove the circulating paper from the system, whether that paper was checks or Federal Reserve notes.

The Interplay with Science Fiction

While the cashless society had a definite science fiction resonance, the concept appears to have originated in the interactions of bankers with computer consultants and technology experts. This is a contrast with many other technological shifts. Jules Verne wrote about space

26. Mitchell, "Governor Mitchell Considers Tomorrow's Banking." In a parallel development, the narrative of cost reduction to justify capital investments around computer technology was quite common in the early and mid-1960s in several European countries. See further Bátiz-Lazo, Maixé-Altés, and Thomes, *Technological Innovation in Retail Finance.*

27. Mitchell, "Effects of Automation on the Structure and Function of Banking."

28. In the mid-1960s both "cashless" and "checkless" were used almost as substitutes and often in the same sentence, such as: "Predictions of a cashless and checkless society are becoming widespread" (Diebold Group, "Summary Report"). This is also the case in trade press reports, whereas central bankers like George Mitchell were more concerned with eliminating checks. See further "Checkless Society Check"; "'Checkless Society' Moves toward the Drawing Board"; Mitchell, "Effects of Automation"; "Governor Mitchell Considers Tomorrow's Banking"; Kramer and Livingston, "Cashing in on the Checkless Society"; Lee, "Tomorrow's Checkless, Cashless Society"; Reistad, "The Coming Cashless Society"; Riday, "The Checkless Society"; "Banks in a 'Checkless Society'"; "Credit: Toward a Cashless Society"; Anderson et al., "An Electronic Cash and Credit System." Towards the end of the 1960s, the rhetoric started to shift to "less-check and less-cash society" after the initial hype was deemed unreasonable. See, for instance, de Jonquieres, "The Cashless Society Comes Closer"; Spencer, "Towards the Cashless, Chequeless Society."

travel, air travel, and long-range submarines decades before such things existed. H.G. Wells warned of the dangers of aerial bombardment prior to the First World War. Once science fiction emerged as a distinct genre in the 1930s and 1940s, its practitioners prided themselves on their scientific knowledge and skillful extrapolation. Arthur C. Clarke claimed to have been the first to conceive of a geosynchronous communications satellite, while moon missions, space stations, and atomic weapons were fictional commonplaces long before their actual debuts. The 1990s saw the spread of the Internet into business and an accompanying media frenzy around the idea of doing business in "cyberspace." The latter was quite literally a science fiction concept, coined by William Gibson.[29]

The readers and writers of science fiction were perhaps more interested in rockets and physics than they were in banking, economics, or organizational innovation. When a fictional society was cashless, it was generally also a moneyless utopia, as with the payment cards used by citizens to spend their standard allocation of "credit" in Edward Bellamy's highly influential socialist novel *Looking Backward* (1888).[30] Capitalism was the default social organization of American science fiction, but few authors put much energy into imagining its future. By the 1940s many had adopted the term "credit" as the universal name for future currencies, including Isaac Asimov for his two main strands of work (the far-future Foundation saga and the near-future Robot stories). Usually, however, this functioned as a simple linguistic substitution for "dollar," and one reads of credits being slapped onto counters, flung to parking attendants, drawn from pockets, and the like. So for most authors, the use of the term did not imply electronic processing of payments.

A partial exception can be found in the early work of Robert A. Heinlein, whose interest in economics and the workings of capitalism was unusual among his generation's science fiction writers. His utopian early novel *Beyond This Horizon* (1948) described a communications network spanning North and South America. An automated cash register, which he dubbed the "auto-clerk" would encode every sales transaction onto paper tape. Aggregated, the tapes fed into a "huge integrating accumulator" (i.e., a computer, to use the term that had not yet been standardized) in the Department of Finance.[31]

29. The startlingly rapid process by which "cyberspace" passed from science fiction into business and political discourse is explored in Turner, *From Counterculture to Cyberculture*.

30. Bellamy, *Looking Backward*.

31. Heinlein, *Beyond This Horizon*. See also the discussion of economics and the role of government on pages 71–72 and 102–3.

However, the function of this machine was to make macroeconomic corrections to keep the economy running smoothly, rather than to maintain individual accounts.

When bankers adopted the techniques of science fiction to describe the future of their industry in the computer age, they were following a pattern established in the very earliest discussion of administrative computer use. Edmund Berkeley, a procedures expert at Prudential Insurance, not only persuaded his employer to become the first business to order a programmable electronic computer but also wrote *Giant Brains*, the first popular guide to computers.[32] Berkeley discussed the actual capabilities of the first experimental computers, but presented this information primarily as a set of clues to what would be accomplished by the machines of the near future. He predicted automatic translation and handwriting recognition as immediate applications, with weather control, automated psychiatrists, and pocket machines to calculate income tax and manage addresses to follow later. In the final chapter he explored the potential hazards of this future, worrying about the dangers of robots revolting against humans or being misused for destructive purposes. Berkeley concluded with the promise that we can "welcome the robot machine as our deliverer from the long hard chores of many centuries."

Published in 1948, Berkeley's book did a great deal to raise expectations for the transformative power of computers when they appeared as commercial products over the next few years. A decade later, *Business Week* discussed the first application of a computer to business administration in the United States. The 1954 installation by General Electric of an automated payroll processing for its Louisville, Kentucky plant had been plagued with problems but was nevertheless the start of a "new industrial revolution,"[33] characterized as "perplexing and disgruntled—but inevitable . . . because computers still hold the key to new systems or organization for the sprawling giants of industry, commerce, and government."[34] This sense of historical inevitability and revolutionary potential served the computer industry well in the decades to come.

Spread of the Cashless Society Imaginaire

The late Rob Kling wrote frequently of the power of "computerization movements," stressing the role of social groups in constructing the

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32. Berkeley, *Giant Brains or Machines That Think*; Yates, "Early Interactions between the Life Insurance and Computer Industries."
33. Osborn, "GE and Univac: Harnessing the High-Speed Computer."
34. Ibid.

apparent inevitability of technological change.[35] These movements spread in industry associations as well as occupational groups. Within the study of financial intermediation, JoAnne Yates has explored the importance of the Life Office Management Association, a trade group, in shaping technology use within its industry. Similar developments have also been documented for Spanish and Swedish savings banks, where, as was the case for US insurers, long before any single firm had an established and stable computing operation, association members were swapping ideas, sharing initial experiences, and legitimating particular applications of the new technology.[36] Such interactions clearly help to build a shared imaginaire and to promote isomorphism between the participating organizations.

The cashless society imaginaire helped to unite and define just such a computerization movement. Early advocates such as Head, Mitchell, and Diebold convinced the American Bankers Association (ABA) to begin investigating the possibility of a cashless society in 1967. Dale Reistad, the ABA's Director of Automation, predicted that it was "nearly inevitable that the banking system . . . will reverse itself and develop a 'checkless' system" by 1980, soon followed by a drastic reduction in the use of cash by businesses and consumers.[37] He also formed a "Checkless Society Committee" to determine "if the American economy can really function without bank checks" and answer the question "what must the banking industry do today to prepare for the eventualities of the future?"[38] The committee invited equipment vendors to demonstrate their most advanced wares and encouraged them to develop point-of-sale terminals capable of initiating transactions in electronic form. The committee also asked retailers to parley about strategies for transitioning toward a checkless, and then eventually cashless, retailing environment. And most importantly, the committee held a number of workshops on electronic payments for bankers across the nation, establishing a common vision that would guide the actions of many bankers for the next several decades.[39] A computerization movement was well underway.

35. Kling and Iacono, "The Mobilization of Support for Computerization."
36. Yates, *Structuring the Information*; Bátiz-Lazo, Bernardo, Karlsson, and Thodenius, "Building Bankomat"; Bátiz-Lazo and Maixé-Altés, "Managing Technological Change by Committee."
37. Reistad, "The Coming Cashless Society." The "reversal" he referred to was a move away from making the processing of paper checks more efficient in favor of completely electronic clearing.
38. "Checkless Society Check."
39. "'Checkless Society' Moves toward the Drawing Board." The chairman of this committee also used the banking and business trade press to sell the vision—for example, see Kramer and Livingston, "Cashing in on the Checkless Society."

The 1960s were a particularly fruitful time in which to launch a computerization movement because the transformational power of the new computer technology was a staple of the American business literature of era. The most widely accepted goal was the construction of a "totally integrated management information system," a massive online computer system automating all routine business processes, providing every manager with exactly the information needed to carry out their duties, and incorporating advanced simulation and forecasting techniques. This imaginaire welded together a powerful alliance of computer vendors, consultants, academics, and other experts for most of the decade—even though no company succeeded in building a system of this kind.[40]

The "computer revolution" promised to remake management and elevate the revolutionaries to positions of great power. This too was often articulated in the language of science fiction. For example, a 1958 *Harvard Business Review* article called "Management in the 1980s" introduced the term "information technology."[41] Its authors treated their readers to a sketch of managerial practice in the far-off world of the late twentieth century, by which point the computer revolution would have run its course. They promised that "top management [will] become more abstract, more search-and-research oriented and correspondingly less directly involved in the making of routine decisions. . . ." This futuristic world would be more hospitable to technocrats, as "researchers, or people like researchers, will sit closer to the top floor of American companies . . . we might expect more impersonal, problem-oriented behavior at the top, with less emphasis on loyalty to the firm and more on relatively rational concern with solving difficult problems."

Advocacy for the adoption of computers and telecommunications tended to come from the middle levels of management, not the upper levels. During the 1960s the American banking industry was heavily regulated, highly fragmented, reliably profitable without any driving need for operational efficiency, and stable to the point of dullness. If it was hard for a bank to fail then, it was also hard for a banker to stand out. Indeed the high technology imaginaire of the cashless society seems to have appealed to younger, more technically minded, and more ambitious members of the industry as a way of overcoming their industry's image as a conservative backwater. A good US example is John Reed, who joined Citibank in 1965 after graduating from MIT's Sloan School of Management. In 1969, at the tender age of 29, he took over its Operating Group and began to automate their entire

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40. Haigh, "Inventing Information Systems."
41. Leavitt and Whisler, "Management in the 1980s."

back office. By the time he was done six years later, the back opera-
tions "more closely resembled an assembly line at General Motors
than anything bankers were used to. . . ." Reed then moved on to lead
Citibank's push into consumer banking services (which was rooted
in automated, self-service terminals), eventually becoming Chairman
in 1984.[42]

The same trend is evident in several European countries. For
instance, prior efforts at the mechanization of British retail financial
institutions led mid-level employees, such as accountants and staff
in Operations and Methods Departments, to make critical decisions
about which computer equipment to purchase.[43] Bátiz-Lazo et al. also
document how the computerization of Swedish savings banks was
spearheaded by a group of young managers under the leadership of
Sven G. Svensson, director of *Sparfrämjandet* (the propaganda depart-
ment of the Swedish savings banks association).[44] During the 1950s
they met at annual conferences at the resort town of Saltsjöbaden (in
the Stockholm archipelago). They were united by the idea that the
savings banks had to adjust to ongoing social change and meet the
challenge of commercial banks (not by demanding protection from
the state but by introducing better services). The computerization of
banking services would meet these challenges. Many ideas that came
out of the Saltsjöbaden conferences were implemented during the
1960s as those attending reached influential savings bank positions.
In Spain, it was also the middle managers of savings banks who regu-
larly attended the meetings of the "Commission of Operations and
Automation" (known as COAS by its Spanish acronym), which led
computerization efforts there.[45]

Inspired by this vision, as well as by the potential to leap ahead of
their competitors, several US banks in the late 1960s and early 1970s
conducted cashless "pilot projects" to determine whether such a
system would be technically and socially feasible. Diners' Club, the
original travel and entertainment charge card, had done a similar
test in 1963, but more as a promotional stunt than to assess true
feasibility.[46] The Bank of Delaware in Wilmington conducted what
may be the first such real test in 1967, "enabling retailers to receive
instant payment for merchandise at the bank via their customers'

42. Nocera, *A Piece of the Action.* The role of middle management in triggering
the organizational adoption of new technologies and shaping their deployment is
documented in Thomas, *What Machines Can't Do.*

43. Bátiz-Lazo and Wardley, "Banking on Change."

44. Bátiz-Lazo, Karlsson, and Thodenius, "Building Bankomat."

45. Bátiz-Lazo and Maixé-Altés, "Managing Technological Change by
Committee."

46. "Selectmen 'Abolish' Money for Premiere," *Hartford Courant*, October 23,
1962.

machine-readable identification cards."[47] In 1971, the President of the City National Bank and Trust (CNBT) of Columbus, Ohio, noted that its "electronic funds transfer pilot test" was intended to "peek into the future and learn the sequence of social and technological developments that will bring about a society where most sales involve the electronic transfer of data and funds, instead of cash and checks."[48] Such experiments were well covered in the banking trade press, which helped to legitimize the idea of a cashless society amongst American bankers.

Bankers were also quick to see a potential connection between the machine-readable cards used in these pilot projects and the rapid spread of new bank-issued credit cards under the new Interbank association and BankAmericard licensing system (i.e., the genesis of VISA), both of which began in 1966, just as the cashless society vision was winning acceptance. Surveys from the time also indicate that at least 70 percent of bankers believed that credit cards were the first step toward the cashless society and that they were entering that business in order to be prepared for what they saw as an inevitable future.[49]

This vision of a cashless society also started to spread beyond the community of banking technology enthusiasts. In his 1968 book *2001* (developed in parallel with the film), Arthur C. Clarke depicted a telephone call placed from space thus: "Floyd, after checking that the Area Code for the United States was still 81, punched his twelve-digit home number, dropped his plastic all-purpose credit card in the pay slot, and was through in thirty seconds."[50] Two years later, the book *Tomorrow's World* (based on a British television series profiling new inventions) included an appendix drawn from the emerging field of "futurology" to provide a comprehensive timeline of the near future. Most of its entries now appear ludicrously optimistic (a Soviet Mars landing in 1988; fusion power in 1996; a polar ice city with a population of 500,000 by 1988). In contrast, entries concerning information technology outlined technological goals that were largely met, even if the authors did not foresee the coexistence of old and new. Computer terminals were to enter the home by 1980, the last national newspaper would close down in 1990, a "world computer-information bank" would be established in 1994, and in 2008 the "Bank of England withdraws cash and notes in favor of [a] credit-card economy."[51] The show itself had featured a lengthy depiction of this cashless future,

47. Kramer and Livingston, "Cashing in on the Checkless Society."
48. C. Gordon Jelliffe, quoted in *Payment System Newsletter*, 1971.
49. Stearns, *Electronic Value Exchange*; Diebold Group, "Summary Report."
50. Clarke, *2001: A Space Odyssey*.
51. Baxter and Burke, "Tomorrow's World."

bolstered by models of an ambitious, real-time banking system under development by Barclays Bank.[52]

Between 1965 and 1970, the checkless–cashless future had passed from a somewhat marginal speculation to a taken-for-granted part of the industry's conventional wisdom. No such payment system was in commercial operation or had been proven in a pilot study of more than trivial scale. In fact the technology to realize the vision did not yet exist, as a series of failed financial industry projects during the late 1960s and early 1970s would demonstrate.[53] Nevertheless, trade associations, technology suppliers, leading banks, industry commentators, and consultants had all endorsed it as not just desirable but inevitable. In the language of the new institutionalism, a new and in some respects quite different kind of bank (with some core operational activities deleted and others added) had been successfully institutionalized within this organizational field as the future organizational form. Any bank not endorsing the new consensus would sacrifice legitimacy and risk being seen as conservative and marginal. Any ambitious young banker would be well advised to cast his (or occasionally her) lot in with the new order.

Although reports and shows like these intended to elicit wonder and excitement amongst the general public, predictions of a coming cashless society could also produce anxiety.[54] Some worried that all this automation would make their banks more impersonal, resulting in clients being treated as "just a number." The removal of paper from the system also bothered those who doubted the accuracy and reliability of computers. Privacy concerns were raised over the loss of anonymous cash, not to mention a system that would track and analyze every purchase made. Those who did not have bank accounts were concerned that they would be forced to open one and pay the required fees, especially if their wages were now to be paid with directly deposited electronic credits instead of a cash envelope. Also, religious groups preoccupied with the end times saw such a system

52. The Tomorrow's World segment "New Banking" was broadcast on December 9, 1969, and can be seen at http://www.youtube.com/watch?v=ccqYKoLbT3I. The Barclays project is discussed in Martin, "Too Far Ahead of Its Time"; "Britain's First Computer Centre for Banking: What Did This Building Do?"

53. In the early 1970s the merger of cash dispensers and computing technology was yet to happen but when it did "it will also be technologically possible to bring in the same system many of an individual's purchases and other money transactions so the much discussed concept of immediate, electronic transfer could well take off at the time." Owen, "Bank Technology: It's an All-Computed Cash Dispensing World."

54. Unless otherwise stated, the reminder of this paragraph is sourced in the review of typical consumer reactions documented in Riday, "The Checkless Society."

as the fulfillment of the "mark of the beast" prophecy from the Book of Revelation.

These consumer concerns played an indirect role in shaping the cashless society concept by way of the legislation they inspired. Traditional paper-based payments were governed by the Universal Commercial Code, which provided consumers with protections such as the ability to stop payments on checks when the merchandise purchased turned out to be fraudulent or faulty. Similar protections had been mandated on bank-issued credit cards early in the 1970s, but it was unclear whether this would also apply to a more comprehensive cashless payments system.[55] In response to consumer concerns, the US Senate Banking Committee took up the issue in 1974, tasking a special commission with investigating emergent problems and preparing solutions.[56] Its recommendations formed the basis of the Electronic Funds Transfer Act of 1978, which clarified the rights of consumers and responsibilities of financial institutions in whatever kind of cashless society that might emerge.[57]

Conflicting Definitions of the Cashless Society

Consensus within the banking industry was established around this negative vision of eliminating cash and checks, rather than being framed as a positive alternative such as "the electronic payment society" or "the credit card society." This is not coincidental. There was a broader range of support for the idea of eliminating cash and checks than for replacing them with any particular alternative, giving the term what sociologists of science like to call "interpretative flexibility."[58] Yet this flexibility could only be sustained for a limited period. Once the inevitability of a cashless society was accepted across an ever-broadening range of groups, it would be increasingly difficult to maintain a consensus over just what that society would look like or how the banking industry would get there. The "cashless society" formulation left those questions open, and, predictably enough, a struggle developed to answer them in ways favorable to the people doing

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55. These were enshrined in the Fair Credit Billing Act, which became law in 1975. See http://www.ftc.gov/os/statutes/fcb/fcb.pdf (accessed February 22, 2012).

56. See *EFT in the United States: Policy Recommendations and the Public Interest: The Final Report of the National Commission on Electronic Fund Transfers* (1977).

57. This Act is enforced as Regulation E by the Federal Reserve. For the complete text, see http://www.federalreserve.gov/boarddocs/caletters/2008/0807/08-07_attachment.pdf (accessed February 22, 2012).

58. See, for instance, Bijker, Hughes, and Pinch, *The Social Construction of Technology*.

the answering. The cashless society imaginaire encompassed not one but many variant futures.

At least six distinct and well-organized groups promoted different structures for transaction processing within the future cashless society. The first was the Federal Reserve, with George Mitchell being its most vocal representative. Not surprisingly, the Fed wanted to remain at the center of the cashless society and thus wanted to construct the electronic analog to their existing, centralized check-clearing services.

The large, technically advanced commercial banks formed the second group, and John Reed of Citibank most clearly articulated their position.[59] Reed saw electronic payments as a competitive weapon, something that would allow innovative banks like his to displace those that were slower to adapt. Thus he advocated the competitive development of proprietary electronic funds transfer (EFT) systems. This was the same model most banks were adopting for their budding automated teller machine (ATM) networks, and Reed saw the point of sale as just another kind of cash machine. Other banks could gain access to Citibank's EFT system, but only for a fee and only on Citibank's terms.

The smaller, less technically savvy banks formed the third group, their position articulated by James E. Brown of St. Louis's Mercantile Trust Company.[60] Concerned that the larger commercial banks would use their technical expertise to consolidate the banking industry, he favored the development of a shared EFT infrastructure managed either by the Fed or by regional associations. He argued that point-of-sale terminal networks were more akin to mailboxes or telephone lines than ATMs, and there was no value to consumers or merchants in having multiple incompatible terminals and cards. Brown's concerns were also motivated by the very real possibility that the Citibanks of the nation could easily turn the smaller banks into tenant farmers.

The fourth group consisted of the credit unions, savings and loans, and mutual savings banks, collectively known as the "thrifts." Norman Strunk, Executive Vice President of the League of Savings Associations, spoke for this large assemblage.[61] Because they were originally chartered to promote consumer saving, the thrifts could not issue checks; customers were required to visit their branches in person to withdraw cash.[62] A cashless society promised them new

59. Reed, "The Case for Own-Your-Own."
60. Brown, "The Case for Shared Terminals."
61. "When We Achieve a Nationwide Electronic Funds Transfer System."
62. Several states began allowing the thrifts-limited third-party payment instruments in the early 1970s, but this was not universal. These accounts were known as Negotiable Order of Withdrawal, or NOW accounts.

service options, provided of course that they were not barred from participating. The thrifts favored a shared system run by the Federal Reserve, which they felt would give them the best chance of having access to whatever EFT system developed.[63]

The fifth group consisted of the large national and regional retailers. In many ways large retailers such as Sears and Montgomery Ward were in a better position to offer a nationwide EFT system than the banks were: They issued more credit cards than all the banks combined; they had "branches" throughout the country that were open late and on weekends; they had an extensive network of electronic cash registers capable of making electronic deposits and withdrawals from cardholder accounts; and many already cashed payroll checks for their working class customers. These retailers were typically not invited to the various banking industry discussions about the cashless society, sparking Gordon Worley, the Vice President of Finance for Montgomery Ward, to warn the bankers not to ignore them: "I think the banks should co-operate with us on this because, if they force us to go our own way, they could find themselves locked out."[64]

The national credit card associations made up the sixth group, and their most vocal and assertive spokesperson was Dee Hock, CEO of the organization that would soon be rebranded as VISA.[65] Hock saw his own organization at the center of a shared, cooperative, international EFT system that would give as much access to small rural banks as it did to large money-center ones. But he also favored the development of several types of cooperative systems, creating competition at the system level so that there would still be an incentive for innovation.

Retail consumers also had their opinions about how the cashless society should operate, but they were not as concerned about ownership and governance as they were about retaining the same sort of features and protections they were already enjoying with paper checks and notes (e.g., the anonymity and freedom of cash, or the ability to stop payment on a check in the case of fraud or defective goods). They were also a less-organized group than any of the others mentioned so far, primarily exercising their will indirectly through their elected representatives (e.g., the Electronic Funds Transfer Act noted earlier, which guaranteed consumer protections but said little

63. Strunk mentioned in the article that the thrifts had been barred initially from the new automated clearinghouse in California and were allowed access only after the Federal Reserve exerted pressure on their behalf.

64. "Banking at the Chain Store—Closer Than You Think." *US News and World Report*, September 16, 1974.

65. The organization was named National BankAmericard Incorporated until 1977. Technically, VISA is a recursive acronym for Visa International Services Association, but it is commonly referred to simply as "Visa" after first use. For a history of Visa's origins, see Stearns, *Electronic Value Exchange.*

about how such a system should be structured). In the early 1970s, consumers lacked the kinds of political access and social media that enabled, for example, the recent pressure to scrap plans to eliminate paper checks from the UK banking system by 2018.[66] Thus, consumers helped to ensure that they would have the same sort of rights in a cashless society as they did in their current one, but they had little input on what the actual mechanisms of that society would be.

Throughout the 1970s and 1980s, the "cashless society" remained mostly a negative vision as these various groups battled to win converts to their particular alternative. Most bankers agreed that some kind of plastic card would likely be the access mechanism, but they disagreed strongly as to how consumer information should be encoded on that card, how the card should be read by electronic terminals, how the consumer should authenticate the transaction, how the transaction should be processed, and who should pay for it all. As bankers established various committees to explore the different options, the payment card association (proto-VISA) forged ahead with its own plans to develop an internationally accepted debit card that would eventually become the main alternative to cash and checks. This card was the brainchild of Dee Hock, VISA's founder, who had recently led efforts to automate both the credit card system's authorization and clearing functions. A debit card based on the same computerized foundation seemed obvious to Hock, but as he would soon discover, it was much easier to sell the negative vision of a cashless society than it was to sell his particular solution.

Visa and the Cashless Society

As a mid-level manager in a Seattle-area bank in the mid-1960s, Hock had become enamored with the possibility of what he would later term "electronic value exchange."[67] His ideas were no doubt influenced by the cashless society vision of the 1960s, but he saw a potential that went far beyond a simple electronic analog to the existing check- clearing system. He envisioned an "asset card" that could instantly access any pool of funds the cardholder might possess—deposits, lines of credit, liquid investments, etc.—at any time

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66. http://www.guardian.co.uk/money/2011/jun/18/cheques-future-treasury-minister (accessed September 19, 2012).

67. Biographical information comes from his autobiography Hock, *One from Many*, and from Nocera, *A Piece of the Action*. Information on the asset card concept comes from speeches Hock gave at the time at American Bankers Association conferences and from personal interviews conducted with other Visa executives. For more details, see chapter 8 of Stearns, *Electronic Value Exchange*.

of day and from any location in the developed world. Merchants would happily accept it because payment would be guaranteed, just as bank-issued credit card transactions were. Cardholders would love it because they could have safe access to their funds whenever and from wherever they happened to be. And the banks would eagerly embrace it because it would allow all of them, even the small community banks, to offer a comprehensive set of services to their customers.

It sounded like a win all around, and the organization launched its first product based on the idea in 1975—the Entrée debit card.[68] This card looked similar to its credit card cousin, was accepted in all the same places, and its transactions could be authorized and cleared electronically, thanks to Visa's new computerized authorization and clearing systems. But only a handful of banks, less than 1 percent of Visa's membership, decided to issue it to their customers.[69] This may seem surprising, as 70 percent of bankers polled a decade earlier had believed that the national credit card networks were the first step toward the cashless society, and now Visa was offering them a functional, electronically processed debit card with established, widespread acceptance. Although the Entrée card most certainly fit into the *general imaginaire* of the cashless society, it conflicted significantly with the *detailed definitions* of that society promoted by other, more powerful bankers.

The Entrée card clashed in two significant ways. First, it operated more like the existing credit cards than the EFT cards the technologically savvy banks imagined. The Entrée card would be accepted by all BankAmericard merchants, which meant that it had to be authenticated with a signature and not a PIN or biometric test. Point-of-sale terminals that allowed cardholder input were available from a few manufacturers, but were very expensive and thus were not yet widely adopted. Merchants could use a simple swipe terminal (or the telephone) to authorize the transaction, but would still need to deposit a paper sales draft at their bank, where it would be captured and cleared electronically. This would permit overdrafts, though no more so than the paper checks the card was designed to replace, and only until the electronic data capture terminals were widely adopted. Still, for many bankers the cashless society was associated with the end of overdrafts, thanks to real-time transaction approvals and balance updates, and they were unwilling to accept any EFT solution that contradicted this.

Second, the Entrée card embedded a different set of assumptions about the competitive structure of the industry. Larger banks tended

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68. Brooke, "New NBI Debit Card Is Named Entrée."
69. "Visa Debit Card Service: A Digest of Key Research Findings." Additional information supplied by Tom Honey, who oversaw the Entrée debit card program.

to favor private, non-shared EFT systems, but the Entrée card was subject to same principle of universality as the credit card: Every bank that participated in the system must accept transactions for all cards. Even banks that favored a shared, cooperative solution might be happy to accept transactions from out-of-town banks, but wanted to deny access, or at least charge a fee, to their rivals down the street. Hock had crafted the operating regulations of his system to prohibit these kinds of selective barriers. This kind of behavior had almost destroyed the BankAmericard licensing system in 1968, and his new organization was not going to make the same mistake less than a decade later.[70]

In addition to these two primary differences, there was also a cultural divide among American banks at this time that worked against the Entrée card's acceptance. Bank credit cards grew out of the consumer credit side of the banks, not the deposit side, and even though the credit cards often contributed significant revenues to the bank's bottom line, they were never considered to be "real banking." Credit card program managers were considered to be one step above pawn brokers and loan sharks and were often physically located far away from stately lobbies and commercial loan desks. The deposit side tended to have the organizational power in any given bank, and thus it defined the bank's EFT requirements and plans. These bankers imagined a cashless society patterned after ATMs rather than credit cards.[71]

Visa debit cards would eventually succeed not only in the United States but also internationally as the end of exchange controls and the growth of computer networks enabled real-time electronic fund transfers initiated at the point of sale. But the failure of the Entrée initiative demonstrates both the power and the limitation of the cashless society imaginaire in guiding actual institutional developments in the industry. Going against the established imaginaire would likely mean failure, but working within it did not guarantee success, unless a sufficiently powerful alliance could be built around a particular technological and business path.

Conclusions

Business historians are already well aware that technology is not simply an economic input of which firms can consume more or less. Neither is it a deterministic force, dictating a single optimal

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70. See chapters 2 and 3 of Stearns, *Electronic Value Exchange*.
71. Ibid; 171–72.

organizational form for a given era. What is important, therefore, are the goals toward which organizations target the technologies they adopt and the assumptions within which they invest in them. These are, in turn, driven by a consensus within an industry as to its future shape. Mimetic isomorphism is at work not only when the actual innovations of other organizations are copied but also when a shared vision of historical inevitability and of the proper application of a new technology is accepted within an organizational field.

Once consensus on the future destination was reached, a variety of specific systems or approaches could be presented as steps toward realizing this future goal, making the future a banner around which a heterogeneous alliance of interests could gather. The vision itself was not deterministic, but functioned as a legitimating resource on which historical actors could draw. As we have seen, the cashless society imaginaire established a common end-point for bankers in the 1960s and 1970s, but they disagreed vehemently about the particulars of the route to get there. Different actors struggled to define what they thought was the proper route, hoping to enroll others into their plans. Crucial steps in operationalizing and shaping the actual application of information technology to realize this vision were taken by middle managers, confirming their importance in the process of change, not just inside individual firms but also within an organizational field as a whole. When technologies failed to perform as expected, this could be characterized as a bump in the road to the future, rather than as a challenge to the inevitability of eventually arriving at the agreed destination.

The discourse of banking technology is still written in the future tense. Fifty years after it first emerged, the idea that clumsy and expensive-to-handle checks, coins, and notes could be replaced by efficient electronic payments (initiated by various types of plastic cards, chip cards or, more recently, mobile phones) is still heralded as a tantalizing prospect for the twenty-first century.[72] The cashless society imaginaire, amazingly persistent over decades, can still be presented as something new and exciting. In Britain the introduction of an electronic payments application for mobile phones by Barclays was recently heralded as the start of a new era by the BBC,[73] while

72. Worthington, "The Cashless Society." The popular press is full of references to idea of using smart cards or mobile phones to replace cash payments. See, for instance, "Challenges to a Cashless World," http://news.bbc.co.uk/1/hi/business/7876154.stm (accessed June 20, 2011); "Nearfield Communication Transforms Travel in Japan," http://www.bbc.co.uk/news/business-13216267 (accessed June 20, 2011); "Your Concerns about a Cashless Society," http://news.bbc.co.uk/1/hi/business/7894666.stm (accessed June 20, 2011).

73. http://www.bbc.co.uk/news/technology-17057570 (accessed February 29, 2012).

David Wolman of *Wired* magazine won widespread media coverage for a new book entitled *The End of Money: Counterfeiters, Preachers, Techies, Dreamers and the Coming Cashless Society*.[74] Even successful imaginaires will be unrealized in one sense or another, as the futuristic gloss around ideas like "cashless society" or "global information society" is replaced by a messy reality in which new and old coexist indefinitely. This is particular striking in the case of the cashless society, which will literally be accomplished only when all checks, bills, and coins have been withdrawn from circulation.

At the same time, the world we live in has undoubtedly moved toward, and been influenced by, the cashless society imaginaire institutionalized within the banking industry during the 1960s. Banks have used computer technology to greatly reduce paper-based transactions involving human tellers and, more recently, with automatic teller machines and internet banking.[75] Middle-class Americans still have checkbooks and still carry cash, but with each passing year they reach for them less frequently.[76] Many grocery stores and small merchants no longer welcome personal checks. Major purchases are almost invariably charged to debit or credit cards, authenticated with either a PIN or a signature depending on the context of use. Small transactions are increasingly processed the same way, but since the use of cash seems to be decreasing at only 2 or 3 percent a year, there will be, at the minimum, a long period of coexistence of old and new payment mechanisms.[77] The power of the cashless society imaginaire

74. Wolman, *The End of Money*.

75. Although bankers, particularly in the late twentieth century, perceived ATMs as a cost-saving device, these were the first successful applications of information and communication technologies which, later on, enabled a move to create multi-channel delivery within retail financial services. Indeed, the infrastructure supporting their interconnectivity (i.e., hardware, software, and organizational learning) was key to the roll out of other delivery channels such as electronic payment at point of sale terminals, telephone, and internet banking. Moreover, in the 1980s the functionality of the ATM greatly expanded to include many other services along side cash distribution (such as out-of-hours deposits, balances, transfers, and third-party payments). So although at one point they were used as a tool for electronic transfer, today their main service to the general public is access to (and thus the perpetuation of) cash. See further Batiz-Lazo, "Emergence and Evolution of Proprietary ATM Networks in the UK."

76. Interestingly the use of cash seems to have increased slightly during the recent financial crisis, both in the Unites States and the United Kingdom, but this is likely to reverse as the economy improves and trust in banking institutions is restored. See *The 2009 Survey of Consumer Payment Choice* from the Federal Reserve Bank of Boston.

77. For instance, in her entry for *Wired* magazine, Chrsitina Bonnington estimated that in 2012 it would take at least a decade for mobile payments to replace bills and coins ("When Will Your Smart Phone *Really* Replace Your Wallet?," http://www.wired.com/gadgetlab/2012/09/when-smartphone-replace-wallet, accessed September 10, 2012).

has been real and sustained over more than half a century. We believe that this demonstrates the extent to which technological expectations of the future influenced management discourse and in turn shaped the institutional development of business. The trajectories of careers, organizations, institutional fields, and technologies were shaped not just by perceptions of current conditions but by beliefs in specific future developments. A carefully constructed sense of historical inevitability reshaped the development of banking industry and the evolution of transaction processing technology to become a self-fulfilling prophecy.

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