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The Premature Death of Electronic Mail: The United States Postal Service's E-COM Program, 1978–1985

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In the late-1970s, the United States Postal Service (USPS) launched an innovative electronic mail service, "E-COM," that sought to integrate networked computing and the postal system. Postal management envisioned E-COM as a path-breaking program that would carve out a key place for postal service in the coming information age. The following examination of the ultimate failure of E-COM contributes to the history of networked computing and communications, while additionally providing a unique perspective on the current precarious state of postal service in the United States. Typically, the decline of postal service is considered to be the result of the "natural" obsolescence of an old medium in the face of new technologies, or it is linked to the failings of a public agency in the face of nimble competition. Yet revisiting E-COM challenges these dominate narratives: A consideration of E-COM highlights the role that private telecommunications companies played in preventing the expansion of postal service into new markets and, importantly, draws attention to the ways in which patterns of technological change are historically and politically situated.

In an era of nearly ubiquitous electronic communication, postal service appears quaint. In the midst of a flood of newly arriving email, frequent Facebook updates, and unspooling Twitter posts, mail, to some, is little more than an out-of-date relic. A recent *Washington Post* editorial wryly notes that "our children's children will marvel at the fact that anyone ever used to send the paper thing called 'a letter'" ("Dead Letter," 2012, p. A16). Indeed, the future of postal service in the United States appears bleak. The United States Postal Service (USPS) faces declining volume, shrinking revenue, and mounting losses. The figures are stark: Between 2007 and 2011, annual mail volume fell by roughly 22%, from 212.2 billion

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pieces to 167.9 billion; revenue, offset somewhat by rate hikes, slid 12% during the same period, leading to a staggering $25.4 billion in losses (U.S. Congressional Research Service [CRS], 2012, pp. 1-2; Greenhouse, 2011). The future shows few signs of improving: Currently in 2012, USPS is losing $36 million each day, and it is on pace to suffer record year-end losses approaching $14 billion (Associated Press, 2012; Nixon, 2012). Ominously, USPS forecasts that it could lose $238 billion in the coming decade.[2] Unsurprisingly, postal management and policymakers are considering a range of drastic responses, including service cuts, the elimination of one third of its workforce—roughly 220,000 jobs—and the closing of more than 3,000 local post offices (USPS, 2011b; see also CRS, 2012, p. 15; Greenhouse, 2011; Williams, 2011). Considering the scope of the crisis, a major restructuring appears imminent (see U.S. Government Accountability Office, 2009; "Rain, Snow, Sleet, and Congress").

The causes underling the withering of the institution of postal service are typically understood to be self-evident: The decline is described as the result of the "natural" obsolescence of an old medium in the face of new technologies, or occasionally, it is read as an illustrative example of the failings of a slow-footed and insulated public agency in the face of nimble competition.[3] Randall Stross, writing in *The New York Times*, nicely captures these narratives, suggesting that, as a public agency operating an infrastructure designed for the "pre-Internet age," USPS "is engaged in [a] race with technology" that "it can't possibly win" (2011, p. BU4). In such familiar accounts, "electronic diversion"—the substitution of regular or hardcopy mail by new electronic forms of communication—is inevitable: New technologies and savvy innovative entrepreneurial firms trump the ossified public bureaucracy and superfluous technology of "snail mail."

Yet an examination of recent history challenges these overly simplistic narratives and suggests a more acute cause of the postal crisis: politics. The decline of USPS is not the result of inevitable momentum of technological change, nor does it spring from the taken-for-granted inability of a public agency to innovate. Rather, the marginalization reflects the successful efforts of private telecommunications companies—aided by the Federal Communications Commission (FCC), Postal Rate Commission (PRC), and commercial mailers—to block the expansion of USPS into new and lucrative communications markets during the 1970s and early 1980s. Powerful interest groups and pliant regulators combined to ensure that the USPS would effectively be shut out from participating in the information age. This was not a *fait accompli.* During this critical period, the future of networked computing was in flux; how these new networks would function, who would operate them, and what types of services they would provide were all open questions (see Abbate, 1999). USPS, forecasting a coming rise in new forms of communication, proposed an innovative venture, an electronic mail service known as "E-COM." Offered as USPS's first attempt to enter the market for networked computer communications, E-COM was a hybrid

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[2] Changes introduced through the Postal Accountability and Enhancement Act (2006) requiring the Postal Service to prefund 100% of its long-term retirement obligations—amounting to $5.6 billion annually—also contribute to the current crisis. However, even if these new burdens were eliminated, USPS would have suffered a $10 billion loss between 2009 and 2011 (CRS, 2012, pp. 3–5; USPS, 2010a, p. 4; USPS, 2011a, p. 2).

[3] See Carroll & Mui, (2010); CRS, (2012); "Dead Letter" (2012); President's Commission on Postal Service (2003); Rosenthal (2011); USPS, (2010b).

service integrating computer messaging and the delivery of traditional hardcopy mail. Intervention by key parties led to significant changes in the design, operation, and economics of E-COM. Though opponents were not able to prevent the deployment of the new system, they did succeed in greatly reconfiguring its basic outlines in a manner that ensured eventual failure. Ultimately, it is astute political maneuvering from well-organized interest groups, and not bureaucratic complacency or the autonomous forces of technological change, that explains the slide of the postal service into technological obsolescence.

The following pages draw from the relevant regulatory dockets, press accounts, and policy documents to trace the contested development, the launch, and the ultimate failure of E-COM. Most centrally, the story of E-COM's rise and fall is assembled through a careful reading of the documents generated by the PRC's multiple reviews of the planning and operation of E-COM. The PRC's inquiries created thousands of pages of testimony, technical filings, and economic analyses that provide a comprehensive record of E-COM. Reviving this little-known chapter in communications history introduces yet more detail and complication into the history of the rise of networked computing.[4] E-COM joins a range of networked technologies and services—including perhaps the best know example, France's Minitel (see Castells, 2000)—that operated alternately, adjacent to, complementary with, or in competition with what became known as the Internet. At the same time, revisiting E-COM reframes the current precarious state of the institution of postal service and offers a critique of the ongoing policy debate. Foregrounding E-COM highlights the narrowness of the current postal reform debate and suggests alternative policy options—namely innovation—which might otherwise be overlooked. In this fashion, revisiting E-COM highlights an important role that historical research can play in contemporary policy discussions.

Remaking Postal Service:
New Technologies, New Challenges, and New Opportunities

By the mid-1970s, postal management, the Department of Commerce, and independent observers agreed that new forms of electronic communication would soon challenge the viability of the United States' postal system.[5] This was not a trivial development. For over 150 years, the monopoly covering the transmission of letters provided the backbone for a host of socially beneficial practices—such as cheap rural service and discounted rates for books, magazines, and newspapers—which sat at the core of the Post Office's public service mandate.[6] As scholars Richard John (1998), Richard Kielbowicz (1989), and Paul Starr (2004) argue, the public Post Office sparked a communications revolution in the United States—transforming the informational landscape in ways that are hard to overstate. Through its operation, the Post Office supported the wide diffusion of public information to every corner of the nation on very generous terms. The Post Office, as an institution, came to embody the notion that communication was a prized public good that was indispensable to a thriving democratic society. By the

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[4] The expansive and incisive works of Abbate (1999) and Ceruzzi (2003), for example, do not touch on USPS's investment and interest in networked computing or E-COM.

[5] For example, see U.S. Commission on Postal Service (1977); U.S. Department of Commerce (1977); USPS (1973).

[6] The letter monopoly undergirded cross-subsidies supporting cheap postage for newspapers, magazines, and rural patrons (see John, 1998; Kielbowicz, 1989; Starr, 2004).

1970s, however, advances in computer technology and networking fed the growth of interconnected computer networks (Abbate, 1999). These new networks threatened to siphon key segments of the postal market, and importantly, to jeopardize the continuation of the benefits associated with a thriving postal service.[7] As computer networks dedicated to financial transactions and electronic messaging systems gained increasing popularity, USPS began to reconsider its place within a rapidly shifting information ecology.

Policy makers and postal management were concerned about the potential impacts of both near- and long-term developments in networked computing. In the near-term, the creation and deployment of low-cost electronic funds transfer (EFT) systems devoted to commercial transactions appeared to pose the largest immediate threat to the public postal service, while the development of electronic message systems (EMS) presented a related, though less pressing, challenge (U.S. Commission on Postal Service, 1977). EFTs included a host of new services used to conduct economic transactions, such as point-of-sale networks and automated banking systems.[8] Planners feared that EFT networks would attract the low-cost, high-volume business market that, at the time, accounted for the bulk of postal revenue (U.S. Commission on Postal Service, 1977; U.S. Department of Commerce, 1977; USPS, 1973).[9] Estimates prepared in the mid-1970s, suggested that EFTs would divert roughly 23% of first-class mail volume by 1985 (U.S. Commission on Postal Service, 1977, Vol. 1, pp. 19, 22–37). Unquestionably, the move to a "checkless society" would soon cut into mail traffic.

Electronic message systems (EMS), however, were taken as a serious long-term threat. Time-sharing computers included messaging programs as early as the mid-1960s (Abbate, 1999, p. 109). During the early 1970s, programmers at Bolt, Beranek and Newmann (BBN) created a basic mail program for the ARPANET, the forerunner to the Internet. Quickly, "e-mail" became ARPANET's most popular feature, allowing users to send and receive electronic mail over the network (ibid., pp. 106–109). At the time, the ARPANET was a limited experimental network; access was restricted to a narrow circle of research universities, key contractors, and the military. The popularization of the Internet, World Wide Web, and e-mail would not occur for quite some time (ibid.). Nonetheless, policy makers read worrying long-term implications into the development of electronic messaging and the diffusion of networked computing. It was only a matter of time, they presumed, before the business-to-home and home-to-home market for electronic communication would mature and begin to slice into postal volumes (U.S. Office of Technology Assessment, 1982).

Taken together, new communications channels would not make traditional postal service irrelevant for decades. But as planners astutely noted, left unchecked, these new systems would target lucrative markets first, leaving USPS with diminishing returns and the continued obligation to serve those

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[7] Cross-subsides and rate-averaging make postal service particularly susceptible to cream skimming (see USPS, 1973).

[8] For a discussion of EFTs, see U.S. Commission on Postal Service (1977, Vol. 2, pp. 441–490).

[9] By the 1970s, a staggering 70%–80% of all first class mail was related to bills, checks, and other financial transactions (U.S. Commission on Postal Service, 1977, Vol. 1, p. 19; U.S. Department of Commerce, 1977, p. 3).

left underserved by new technologies (see U.S. Commission on Postal Service, 1977; U.S. Department of Commerce, 1977; U.S. Office of Technology Assessment, 1982). In response, USPS proposed an ambitious new service designed to expand its reach into networked computing: E-COM.

An Electronic Postal System: E-COM

In 1978, the Postal Service Board of Governors proposed the creation of a new service combining networked computing and hardcopy postal services. Rather than sitting idle and presiding over a dwindling market for traditional postal products, USPS sought to become a player in the expanding field of new communications. USPS, and its predecessor the Post Office, had been interested in the feasibility of some iteration of electronic mail for quite some time; between 1969 and 1976, they oversaw 21 different studies exploring various electronic mail schemes (Jones, 1978; PRC, 1979, p. 21). The proposed system, E-COM, short for "electronic computer originated mail," sought both to secure a presence for USPS in the expanding electronic communications market, and to cushion future erosion of mail volume. With E-COM, USPS attempted to begin the process of gradual reinvention, transforming itself—and what defined "postal service"—from a simple purveyor of letter carriage and parcel delivery into a more eclectic communications provider. Postmaster General William Bolger described the adoption of electronic transmission of mail as the "obvious next step for the Postal Service" (quoted in Bruns, 1979, p. H13).

On the surface, there was broad consensus between USPS; the Congressional Commission on Postal Service, which had been convened to study the incipient postal crisis; and the PRC, the independent authority responsible for reviewing proposed rate and classifications changes, that some form of expansion was necessary (see PRC, 1979; U.S. Commission on Postal Service, 1977; USPS, 1978). Indeed, E-COM appeared to be a conservative move; rather than attempting to extend monopoly privileges to the electronic domain, it was intended to compete with a range of somewhat similar private services. Yet, with E-COM, USPS was both challenging a long-held division between postal service and telecommunications and testing the limits of relatively new statutory powers. Historically, postal service in the United States operated independently from telecommunications (see Starr, 2004). Unlike many other countries where post, telegraph, and telephone were joined under a single state operator, in the United States, telegraph and telephone service matured into private enterprises governed by federal regulation, while postal service remained operated directly by the federal government. In 1970, however, the Postal Reorganization Act transformed the statutory framework governing postal service, replacing the Post Office Department, a cabinet-level department previously responsible for the delivery of mail, with USPS, an independent federal establishment. Though post remained a state monopoly, the law was explicitly designed to encourage USPS to develop and adopt new technologies to increase the efficiency of the postal system, which had been a perennial problem for the Post Office Department (see President's Commission on Postal Organization, 1968). With E-COM, USPS seized on the act's support for modernization and sought, somewhat cautiously, to revisit the historic cleavage between postal service and telecommunications.

On September 8, 1978, the USPS Board of Governors formally filed a request with the PRC to adopt electronic computer originated mail as a new subclass of first-class mail, stating that "entry into the electronic mail field will in a large measure determine the future of its operations" (quoted in PRC, 1979,

p. 1). USPS argued that its involvement in networked computing supported the public interest: Unlike private industry, long-standing norms and statutory obligations ensured that any electronic mail services offered by USPS would be offered uniformly across the nation to all and include strict privacy protections.[10] Additionally, USPS argued, the integration of networked computing and hardcopy letter service would fulfill the Postal Reorganization Act's call for improved efficiency, and critically, would obviate the need in the future to cut public services in response to declining revenue from electronic diversion.[11] For over a century, the monopoly over letters had provided a stable foundation upon which postal service rested, but now, new information and communication technologies made the monopoly porous.

USPS outlined the details of its proposed system before the PRC. E-COM was intended as an integrated communications system, combining electronic message transmission, data processing, printing, and physical delivery of hardcopy letters. USPS targeted E-COM to businesses that sent a large number of bills, advertisements, or notices to their customers, many of which already used computers to prepare their mailings (Jones, 1978). E-COM would offer a convenient way for businesses to quickly sync their computing work with the physical postal network. Under the plan, USPS would contract with a telecommunications carrier to create a national telecom network linking 25 designated "serving post offices" (SPOs), each of which would be outfitted with computers and printing equipment. The mechanics of E-COM were straightforward: E-COM customers would send electronic messages to USPS's central mainframe computer, a UNIVAC 1108 in Middletown, VA, for initial data processing; the Postal Service would then transmit the electronic messages to an SPO near the message's final destination through its leased telecom network; the messages would be processed and printed at the SPO, and then entered into the regular hardcopy, first-class mailstream for delivery (PRC, 1979, pp. 2–7, 29, 61). Under the submitted plan, USPS guaranteed delivery for all E-COM letters within two days (ibid., p. 25).

Though E-COM was not designed to provide end-to-end, fully electronic, computer-to-computer communication, it was intended as a first step into the realm of new communications technologies. E-COM was what was known as a "Generation II" system, combining electronic input and transmission with hardcopy delivery. Generation II systems stood as a transition between existing hardcopy systems and computer-to-computer, "Generation III," messaging systems (ibid., pp. 17–19). For customers, the value of E-COM rested in the cost savings and convenience passed on by bundling data processing, transmission, and physical delivery; for USPS, E-COM presented new revenue streams and a foothold in electronic communications (see Duffy, 1979; O'Doherty, 1979). Importantly, E-COM would establish "electronic mail" for the first time as a class of mail: Electronic messages sent through USPS would be subject to the same protections and benefits of traditional letters designated as first-class mail (PRC, 1979, p. 169).

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[10] Under the terms of the Postal Reorganization Act, all classes of mail are to be offered across the country at uniform rates. Additionally, first class letters are provided legal protection from unlawful opening. USPS argued (quoted in PRC, 1979) that the operation of E-COM under their supervision would extend these terms to electronic mail.

[11] A summary of USPS's testimony is included in PRC (1979, pp. 1–24).

Monopoly, Mail, and Innovation: Challenging E-COM

E-COM generated immediate controversy and faced stiff resistance from telecommunications companies and, to a degree, business mailers. The telecom industry was nearly unanimous in their opposition to E-COM: They worried that it would smother the competitive market for hybrid mail, and more troubling, that it would lead to the eventual adoption of a postal monopoly covering computer-to-computer communication.[12] At the same time, well-organized mailers attacked USPS's plan, charging that this new expensive project would invariably inflate rates for traditional mail. Mailers that relied on regular hardcopy mail as part of their day-to-day business were clear: They had no intention of paying for the new venture. A host of telecommunications companies, industry trade groups, and mailers outlined their grievances and concerns during the PRC's extensive review of E-COM. Additionally, as the PRC's evaluation proceeded at a stately pace, in what turned out to be an important move, a telecommunications company offering a competing service, Graphnet, took their concerns about E-COM to the FCC.

The telecommunications industry vigorously argued against USPS's plan. Telecom companies claimed that E-COM would unfairly dominate the market for hybrid mail services and prevent private industry from carving out a significant share of the market for value-added mail services. AT&T complained, noting that it was "naturally disappointed that the Post Office is being encouraged to provide a kind of service" that "private industry is able to do" (quoted in Jones, 1979, E1). Likewise, TDX Telecommunications (TDX) charged that E-COM amounted to nothing less than the "invasion of [the] competitive marketplace," and that it raised the specter of substantial "anti-competitive consequences" (1978b, p. 587). At the time, hybrid mail appeared to be an area of growth. By 1978, AT&T, MCI, TDX, American Facsimile Systems, GTE, Graphnet, and others offered, or had plans to soon offer, electronic mail services that would directly compete with E-COM.[13] Graphnet already operated a service combining postal service and telecommunications that was substantially similar to E-COM, while TDX's "DATAPOST" offered service that echoed USPS's proposal (Graphnet, 1978b; *Graphnet Systems, Inc.*, 1979; TDX, 1978b). In the coming years, these companies would invest hundreds of millions of dollars in support of hybrid mail, to say nothing of next-generation computer-to-computer services (Achiron et al., 1984; "MCI Corp. Launches New Bulk-Mail Service," 1984). Telecom companies argued that E-COM was plainly unfair: Unlike private industry, USPS paid no taxes and, most importantly, collected revenue from a legally protected monopoly covering first-class mail. Competitors and potential competitors warned that USPS would use access to monopoly revenue to unfairly cross-subsidize E-COM and price the service at a discounted, below-cost rate in an effort to suffocate private competitors (see *Electronic Message Service Systems*, 1980; PRC, 1979, p. 168; PRC, 1980, pp. 7–8).

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[12] Pitney Bowes was one of the few private companies to publicly support E-COM (*Electronic Message Service Systems*, 1980, p. 168).

[13] See Achiron, Ma, & DeRochi (1984); American Facsimile Systems (1978, pp. 635–639); *Electronic Message Service Systems* (1980, p. 86); Graphnet Systems (1978a, pp. 502–504); *Graphnet Systems, Inc.*, 1979; GTE Service Corporation (1978, pp. 581–582); Jones (1978, 1979); "MCI Corp. Launches New Bulk Mail Service" (1984); MCI Telecommunications (MCI, 1978, pp. 511–512); TDX (1978a, pp. 520–523).

Critics of E-COM also worried about the precedent that it might set. AT&T, MCI, Xerox, and others viewed E-COM as a canny preparatory move that foreshadowed the later expansion of the postal monopoly to cover new computer-to-computer communications services (see *Graphnet Systems, Inc.*, 1979; PRC, 1979, pp. 63–168; Xerox Corporation, 1978, pp. 621–626). They worried that, should E-COM prove a success, USPS would eventually institute a Generation III, computer-to-computer, monopoly messaging system. USPS unambiguously stated that it had no interest or intention of extending the postal monopoly.[14] Still, telecom companies remained unconvinced; they attacked E-COM on the grounds that it portended just such a move. For the telecommunications industry, E-COM represented an important test case: Blocking E-COM was critical to blunting later USPS involvement in Generation III messaging.

Key mailing groups lent their voices to the chorus opposing E-COM, as well. In an effort to ensure that the rates they paid for traditional mail did not rise, the Council of Public Utility Mailers (CPUM), an interest group representing electric and gas utilities, argued before the PRC that E-COM should be self-supporting and not draw revenue from traditional hardcopy postal services (CPUM, 1978b, pp. 569–570). These concerns were not to be taken lightly: CPUM represented utilities serving over three quarters of all electricity customers and 95% of all gas customers, accounting for over 900 million first-class letters per year (CPUM, 1978a, 486–488). Other large-scale users of the mail for business purposes, such as J. C. Penney and the Association of American Publishers, joined in arguing for strict separation between the finances of E-COM and all other classes of mail (Association of American Publishers, 1978; J. C. Penney Company, 1978). Here, the concerns of traditional mail customers aligned with the concerns of telecom companies: Both spoke against the unfairness of cross-subsidies between existing postal services and E-COM.

Competition and the Public Interest: The FCC and E-COM

The PRC's review was contentious and slow-moving, stretching over 15 months. As the review progressed, Graphnet sought the aid of the FCC in blocking E-COM. Turning to the FCC was a shrewd move on the part of Graphnet; it both provided an additional opportunity for the telecom industry to lobby against the plan and offered a hedge against a potential unfavorable PRC ruling. In filing with the FCC, Graphnet reiterated its main concerns—that USPS would use its unique position to unfairly subsidize E-COM and crush competition—and asked the FCC to preemptively assert that it would regulate E-COM in the event that the project was approved by the PRC. Key telecommunications companies—such as AT&T, GTE, and MCI—joined Graphnet in soliciting FCC support. Ultimately, the FCC's ruling would play a key role in limiting the involvement of USPS in new communications services.

The FCC of the late 1970s was disposed to be sympathetic to the concerns raised by the telecom industry. Over the preceding decades, the FCC had shifted how it viewed its role in securing the public interest. In broad strokes, the FCC began to more directly equate the public interest with competition in telecommunications. Historically, the FCC had supported regulated monopolies in telecommunications,

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[14] During PRC hearings, a Postal Service witness testified: "The Postal Service has no intention to apply the private express statutes to the electronic transmission of messages" (PRC, 1979, p. 163).

overseeing the monopolies of AT&T and Western Union in order to ensure that they provided basic levels of service at a reasonable price. In a reversal, during the 1960s and early 1970s, the FCC began to use its regulatory power to open formerly closed domains to competition from smaller players (notably, MCI).[15] Just prior to the E-COM case, Graphnet was instrumental in securing an FCC ruling in *Domestic Public Message Services* (1979) that opened the field of public messaging systems—including facsimile, teletype, and computer printing services—to competitive entry. Previously, the entire field was preempted by Western Union (see *Domestic Public Message Services*, 1979; *Graphnet Systems, Inc.*, 1979).

In keeping with this shift in regulatory policy, the FCC's declaratory ruling in *Graphnet* (1979) accepted the key arguments of the telecom industry. The ruling stated that, if E-COM received approval from the PRC, the FCC would consider USPS as a common carrier engaged in telecommunications resale and, importantly, use its regulatory powers to preserve competition. The Communications Act of 1934 provided the FCC with jurisdiction covering interstate communication by wire or radio. By virtue of the leasing of telecom links connecting scattered post offices, with E-COM, USPS would, according to the FCC, be engaged in common-carrier activity subject to rate regulation. The FCC shared the concerns of the telecommunications industry and worried that USPS would use cross-subsidies and its control over physical letter delivery to prevent the flowering of competition for hybrid mail. Without strict supervision, the FCC concluded, E-COM presented the "real possibility that electronic transmission services could evolve into a non-competitive market, perhaps exhibiting far less innovation, imagination, and efficiency then services provided by competitive entities" (ibid., p. 296). The FCC reassured telecom providers that, should the PRC approve E-COM, it would use its regulatory authority to support competition and ensure fair play.

The FCC ruling did not merely assert jurisdictional authority over the telecommunications activities included as part of E-COM; the *Graphnet* ruling was far more sweeping. The FCC concluded that, if adopted, it would also regulate the physical delivery of E-COM letters. The FCC rejected suggestions that it restrict itself to overseeing the portions of service that directly touched upon telecommunications. Relying on language in the Communications Act of 1934, the FCC noted that it had the authority to regulate not only communication by radio or wire, but "all instrumentalities, facilities, apparatus and services (among other things, the receipt, forwarding, and delivery of communications) incidental to such transmission" (ibid., p. 287). Under this provision of the Act, the FCC claimed authority to regulate all aspects of E-COM, including the final delivery of hardcopy E-COM letters. It asserted that complete regulatory supervision of the service was warranted to ensure that all providers of hybrid mail services, such as Graphnet, had equal access to postal delivery services. The FCC reasoned that USPS's control over physical delivery placed it at an enormously powerful position to limit competition for hybrid mail. Competitive hybrid mail providers would inevitably require interconnection with local postal offices to merge their messages into the regular mailstream for final delivery. USPS, however, by virtue of its monopoly over letter delivery, controlled the "last mile" through its delivery network. Thoroughgoing regulatory supervision by the FCC, then, would ensure that USPS did not discriminate between its in-house service—E-COM—and competitors seeking interconnection. If E-COM was approved by the PRC, the FCC would undertake, for the first time, the regulation of what were explicitly and unambiguously postal

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[15] For a detailed discussion of the deregulation of telecommunications, see Horwitz (1989, pp. 221–263).

activities—the delivery of letters by postal carriers to homes and businesses—creating a direct jurisdictional conflict with the PRC.

Redesigning E-COM: The Postal Rate Commission Concedes

The FCC's expansive ruling directly shaped the PRC's eventual E-COM decision. The PRC opinion, issued in December of 1979, nominally agreed with the USPS proposal, stating, "[W]e find that the Postal Service's intention to enter the electronic mail field is not only justified but also likely to benefit the Nation in substantial ways" (p. 2). However, despite offering platitudes in support of the USPS plan, the PRC's decision substantially rejected the basic program submitted for review. In its place, the PRC devised—over the dissent of two presiding commissioners—its own system that significantly departed from the USPS proposal (see Duffy, 1979; O'Doherty, 1979). The ruling altered E-COM in three ways. First, it barred USPS from establishing a telecommunications network interconnecting designated serving post offices (SPOs); USPS could print and deliver E-COM messages, but it could not transmit electronic mail between offices. Second, cross-subsidies could not be used to support E-COM; the service would need to be fully self-supporting. Third, the new service would be offered for a limited, trial, period. The decision was a triumph for E-COM's critics: The PRC's ruling was tailored to avoid conflict with the FCC and satisfy the objections of the telecommunications industry and mailers aligned against E-COM (see PRC, 1979, pp. 6–10, 36–59, 160–168). Ultimately, the PRC's conservative approach subverted the viability of E-COM. It would, in time, effectively doom USPS's establishment of a long-term presence in the market for new communications services. As dissenting PRC chairman James Duffy bitterly, and prophetically, remarked, the PRC's decision would "preclude Postal Service entry into electronic mail" and "permanently trap the service in a subordinate role from which it cannot escape" (1979, p. 1).

The PRC decision approved an alternative system designed by the Commission's staff, rather than the plan submitted by USPS. Significantly, the new plan excluded USPS from entering the field of telecommunications. As the PRC plainly stated, "The system we recommend does not place the Postal Service in the business of acting, directly, or indirectly, as a telecommunications carrier" (1979, p. 8). The design limited USPS to printing and hardcopy delivery. Under the reconfigured plan, USPS would not host a telecommunications network connecting a web of SPOs, nor would it handle the transmission of electronic mail. E-COM customers would individually contract with private telecommunications companies to arrange for transmission to a designated SPO. As the PRC described its system, "the customer would pay the Postal Service only for mail system costs and data processing, and would pay the carrier of his choice, separately, for transmission costs" (ibid., p. 34). Recall that, under the USPS's initial proposal, E-COM bundled electronic transmission, data processing, printing, and hardcopy delivery. Now, however, the PRC moved to sever these different services and cut USPS out of telecommunications.[16]

The PRC justified its decision on the grounds that a jurisdictional conflict with the FCC would delay the introduction of E-COM (ibid., p. 6). The PRC assumed that the redesigned E-COM would forestall any jurisdictional conflicts. It reasoned that, if USPS was barred from offering telecommunications service,

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[16] Duffy charged that the revised E-COM was an "envelope-stuffing service, not an electronic mail service" (1979, p. 1).

the FCC could not extend its jurisdiction to cover hardcopy letter delivery (ibid., p. 43). The alternate system also protected the PRC's turf. In *Graphnet,* the FCC threatened to extend its regulatory authority into the heart of USPS operations—the delivery of hardcopy letters—and usurp the power of the PRC. By eliminating integrated telecommunications service from E-COM, the PRC not only obviated the FCC's jurisdictional claims, but also preserved its own oversight power of postal operations.

The PRC's redesigned system, not incidentally, aligned with the aims of the telecom industry. For the PRC, robust support for competition was unquestionably desirable. Taking its cues directly from a spate of recent FCC decisions supporting liberalization, the PRC viewed competition as synonymous with the public interest (ibid.). The PRC quelled concerns that E-COM might, one day, morph into a Generation III computer-to-computer system. The PRC's plan created—or, more accurately, reaffirmed—a tidy division between telecommunications and postal services: Postal services would be restricted to the handling and delivery of hardcopy letters, while telecommunications services would, in the main, remain the province of private industry (ibid., pp. 163–167). The telecom industry had initially fretted that E-COM would eventually lead to the expansion of the letter monopoly to electronic communication. In its issued opinion, the PRC reassured private industry that electronic communication would remain beyond the scope of the postal monopoly. The redesigned system, in fact, could actually prove a boon for industry players: In order to send E-COM letters, customers would contract with a private telecom carrier to transmit electronic messages to USPS.

The PRC decision also moved beyond issues of system design to place further limiting conditions on E-COM. The decision made clear that all the costs of the project would be borne exclusively by new E-COM customers: cross-subsidies could not be used.[17] For the PRC, the telecom industry's concerns about predatory pricing and unfair competition were valid. To protect the interests of industry, the PRC specified that E-COM would be added to the mail classification schedule as a special standalone subclass of first-class mail (ibid., pp. 160–168). This point would have important ramifications. Generally, postal rates are calculated based on the direct and indirect costs accrued by a particular class of mail: Each class of mail must pay its freight, plus a share of institutional costs. If E-COM were considered as "regular" first-class mail, the costs of the new system could be averaged across all first-class mail customers. This form of rate-averaging would have, of course, greatly reduced the per-unit costs of E-COM, making the service comparatively cheap. The notion of grouping E-COM with regular first-class mail was not, on its face, unreasonable. Historically, new methods of moving the mail, including the use of railroads and airplanes, were adopted and became a regular feature of first-class mail. As first-class mail moved by a mixture of technologies—planes, trains, and trucks all moved different pieces of first-class mail—USPS did not divvy first-class postage based on the specific costs associated with transportation, but rather, it averaged the different costs across the entirety of first-class mail rates.[18] USPS attempted to make this point, stressing that electronic transmission was simply the latest in a long line of innovations designed to improve mail transportation. In the view of USPS, electronic transmission was scarcely different from the previous successive adoptions of railroads and airplanes (ibid., pp. 21, 59, 176). Yet for the PRC, E-COM was

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[17] The move to prevent cross-subsidies colors the entirety of the PRC's decision (1979) and subsequent reconsidered decision (1980).

[18] In 1977, USPS officially enfolded domestic airmail into regular first-class mail (USPS, 2007).

different. E-COM sat at the intersection of traditional and new lucrative communications markets that were yet to mature. The introduction of E-COM as a special subclass of first-class mail was intended to protect companies offering or seeking to offer competitive hybrid mail services. By preventing the use of revenues from traditional first-class mail, the PRC ensured that USPS would not be able to undercut the competition (ibid., pp. 160–168), but it also placed E-COM on fragile footing: E-COM would need to stand alone, supported only by the customers of the new service.

The PRC also defined it as an "experimental" service. Unless USPS submitted detailed market, cost, and volume data for additional PRC review, E-COM would terminate on October 1, 1983.[19] The experimental classification was novel: The PRC had never before approved a service or rate as experimental, nor did the statutory language defining the role of the PRC clearly indicate that it had such power.[20] The PRC appended the experimental status and fixed termination date because of what it described as the myriad uncertainties and "unknowns" associated with E-COM (ibid., pp. 7–13, 269–272). For the PRC, E-COM was a risky venture—technology continued to evolve, and the market for hybrid mail was not yet well-defined. By establishing it on a trial basis, the PRC provided itself with an opportunity to revisit the program during the next few years and engage in a comprehensive reevaluation. E-COM rested on shaky ground: The PRC reserved the right to pull the plug after only a few years of operation.

The Premature Demise of E-mail: The Failure of E-COM and Its Legacy

The PRC-approved version of E-COM launched on January 4, 1982 (USPS, 2008). Quickly, the significance of the qualifications and alternations imposed by the PRC became clear. USPS initially envisioned the value of E-COM to lay in its convenient bundling of transmission, data processing, and physical delivery for large customers. Yet the reconfigured E-COM was complicated; customers had to secure private contracts for electronic transmission in order to interconnect with the service. Under the redesigned system, the key benefit of E-COM for customers, the convenience and cost-savings provided through bundled service, was largely absent. E-COM volume grew modestly, but below expectations, during its first few months of operation: During the first 6 months, only 660,000 E-COM messages were sent; by July of 1982, however, USPS was handling 172,000 messages per week (U.S. Office of Technology Assessment, 1982, p. 4). During its first year, E-COM volumes totaled 3.2 million; during fiscal year 1983, volumes grew to a more respectable 15.3 million (USPS, 2008).

The PRC quickly moved to revisit E-COM. USPS successfully challenged the PRC's use of the experimental designation in court, but the PRC used its role in rate-setting to the same end.[21] The experimental designation was originally imposed to provide the PRC with the option to review E-COM. Despite the removal of the experimental qualification, the PRC used its first opportunity—a rate hearing opened in 1983—to revisit E-COM. Here, the PRC seized on the opportunity to revaluate—and dramatically alter—the service. In setting new rates, the PRC insisted that E-COM would now have to start recovering

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[19] See, Attachment A. "Classification Schedule 100: First-Class Mail," included in PRC (1979).

[20] For a discussion of the novelty of the experimental designation and statutory authority, see PRC (ibid., pp. 269–275).

[21] See *The Governors of the United States Postal Service* v. *The Postal Rate Commission* (1981).

its costs earlier than expected, beginning in 1985 rather than 1987 (PRC, 1984, pp. 48–56). Postal management pleaded in vain that cost recovery should wait until the service matured and the market expanded. By waiting until more users adopted the service, costs could be spread across a larger base of customers and, importantly, reduce any possible rate increase (ibid.). The PRC, however, insisted on earlier recovery. Responding to the complaints of telecommunications companies and mailers, the PRC pushed forward cost recovery based, in part, on the grounds that doing so would level the playing field with respect to private competitors and, importantly, ensure that other classes of mail would not be saddled with the costs accrued by E-COM (ibid., pp. 45–56). The importance of the PRC's prior decision to sever E-COM costs and rates from the larger pool of traditional first-class mail now became plain. Without the ability to either amortize the costs of the new service across an extended period or offset costs by relaying on the cushion provided by traditional first-class mail, E-COM became prohibitively expensive. Unlike private industry, which might tolerate losses in an attempt to build a customer base and grow a new service, USPS had to, in effect, launch a new service that was immediately profitable or, at the very least, broke even. The PRC recommended new rates which, were they to go into effect, would have increased the cost of using E-COM by a staggering 100% to 200%, raising prices from 26 cents for a single page, and 5 cents for an additional second page, to 52 cents and 15 cents, respectively.[22] For a new service that was growing at a modest, if steady rate, the PRC decision was a death sentence.[23] Under the new terms, each E-COM-letter would now cost 32 cents more than a regular first-class letter (previously, E-COM-letters outpaced regular first-class mail by six cents; ibid., p. 19). Faced with this massive spike in rates, and fearing that the increase would lead to plunging volumes and a sharp deficit, USPS decided to discontinue E-COM. A mere 30 months after its inauguration, the Postal Board of Governors, feeling that their hand had been forced, decided to abandon E-COM (USPS, 1984). On September 3, 1985, E-COM was officially discontinued (USPS, 2008). The presumed future of postal service lasted less than four years.

The significance of the failure of E-COM resonated. The PRC set a firm precedent: "Electronic mail" was not mail at all; it was something altogether different that was beyond the boundaries of postal service. E-COM tested the historic division between postal service and telecommunications, as well as the ability of USPS to innovate under the Postal Reorganization Act. Now, after the public failure of E-COM, the USPS turned, with little alternative, to embrace its traditional role in providing hardcopy delivery services. The late 1970s and early 1980s were, as noted above, a critical period in the formation of a new information ecology: How new technologies would merge with or displace traditional outlets was an open question. More important, who would control this new ecology—that is, who would oversee the terms upon which emergent communications technologies and services would be developed and extended—was, at the time, unfixed. Rightly, USPS saw the implications and importance of the development of new information and communications technologies, and it tried to position itself as a key player. With the failure of E-COM, however, it lost an opportunity to stake an early and lasting claim.[24] Many years later, USPS would try to capitalize on the rise of the Internet and e-mail, instituting a host of short-lived

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[22] The Postal Service argued for a far more modest increase of 31 cents and 9 cents, respectively (PRC, 1984, pp. 1–2).

[23] On this point, see Duffy (1984).

[24] On the importance of constitutive moments and technological momentum, see generally Hughes (1993) and Pierson (2004).

electronic mail services, notably an E-COM-like scheme dubbed "Post Electronic Courier Service" during the late 1990s, but it was too late: A stampede of companies and competing services now crowded the market (see PRC, 2004). USPS had missed its moment.

Rethinking the Postal Crisis: Historiography and Public Policy

In some ways, the plight of E-COM may appear to be a trivial episode in the long history of postal service—a short-lived program that faded into obscurity. Further, it is difficult to see how "e-mail" has suffered from a lack of USPS involvement. Yet, the complicated story surrounding E-COM provides a useful reminder of the role often played by politics in directing the trajectory of new technologies. The narrative of E-COM offers a rejoinder to ahistorical accounts of technological development and reveals the important, often constitutive, role that interest group politics, regulatory decisions, and power can play. During a formative period, telecommunications providers and their allies worked to check the expansion of the definition of "postal service." The PRC's capitulation to the concerns of private industry, the FCC, and well-organized customers for traditional first-class mail resulted in the launch of a flawed and unsustainable version of E-COM. Now, the seeming slide of postal service into obsolescence can be read as a story of political power.

Yet reexamining E-COM does more than illuminate the contingency of the present: It complicates and offers an important contribution to the ongoing debate about postal reform. E-COM suggests alternative possibilities—possibilities that might otherwise remain overlooked—for reform while, at the same time, underscoring the challenges likely to confront the pursuit of such options. In this regard, E-COM outlines a robust role for historical scholarship in ongoing policy debates. Reviving overlooked and forgotten historical narratives can help to critique and expand the range of currently discussed and available policy options; the recovery of forgotten stories points toward new avenues for action and possibilities that might otherwise remain unconsidered.

As noted in the introduction, the institution of American postal service is in the midst of crisis that portends wide-ranging restructuring. The discourse surrounding postal reform, to a large degree, takes for granted the necessity of reducing or eliminating services; the notion of seeking to revitalize a growing postal service is largely muted. Revisiting E-COM, however, suggests another possibility: postal expansion and innovation. Recovering the story of E-COM illustrates that the pursuit of innovation is firmly rooted in postal history. Here, postal service is presented not as a conservative institution bound to a rigid set of practices, but on the contrary, as an institution open to change and adaptation. To be sure, E-COM, even in its original iteration, contained flaws and was not assured of success. Yet nonetheless, the story of E-COM belies the notion that postal failure is inevitable and questions the thinly-sketched caricature of USPS as a complacent monopolist. E-COM offers a reminder that the boundaries of technologies are rarely unambiguous, but instead, they are flexible and contested—both open to renegotiation and tightly policed.

At the same time, foregrounding E-COM offers a sobering appraisal of the challenges likely to confront attempts to expand the definition of "postal service" beyond its traditional province. E-COM, to be clear, was a failure. The division between postal service and other forms of communications has become only more rigid since the late 1970s and early 1980s. The failure of E-COM was significant, in some respects, precisely because it occurred at an opportunistic moment when the new information ecology had

not yet ossified. During the birth of E-COM, private telecommunications companies saw that new technologies would likely morph into lucrative new markets. The precise form that these new technologies would eventually take was not yet clear, but it was clear that the stakes were quite high. Now, possible expansion into new communications services threatens to tread not only on markets that have the potential to blossom, but on those that have already flowered. As a result, the barriers preventing expansion into new communications markets appear more securely fortified than before. This, however, does not mean that innovation targeted in different directions is not possible or desirable. A policy program supporting postal innovation would likely have to pursue new opportunities that capitalize on USPS's assets—a network of local offices, an expansive delivery network, and strong brand recognition and trust—rather than revisit the lost opportunity represented by E-COM.

E-COM alerts us to the paucity of the current policy debate surrounding postal reform, while serving as a stark reminder of the difficulties and hazards that await attempts to expand the range of available options. Difficulties and hazards, however, are not certainties. As threatened service cuts begin to directly impact local communities, postal workers, and businesses that rely on the postal network, postal service is beginning to become increasingly politicized. Vocal support for a robust public postal service, perhaps, could translate into practical political support. The failure of E-COM, at the time, appeared to be little more than a trifle—there was no outcry of support for a struggling, minor new service. Yet as the core elements of the institution of postal service are now under threat, perhaps a new window for innovation and reform has cracked open.

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