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Rethinking legacies in internet history: Euronet, lost (inter)networks, EU politics

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ABSTRACT

Mainstream internet histories employ legacy perspectives to establish lineages of continuity that demonstrate how *American* pasts still operate in and affect our Internet present. This article rethinks legacies in internet history by positioning the notion of *legacy systems* as conceptual basis for a genealogical and non-teleological framing of internet history aimed to investigate lost network events as legacies of European pasts that persist and continue to affect our networked present. To demonstrate its historiographical value, I use the history of Euronet as a case in point, using a variety of primary and secondary sources, to argue that the legacy system of European cooperation and politics on which Euronet was imagined and built, persists within internet history through a variety of "successes" and "failures," of which Euronet is only one.

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Introduction

Why have we forgotten about Euronet—the Pan-European internet[1] that developed in the 1970s under the direction of the European Commission (EC)? Euronet was planned and envisioned to serve as a starting point and catalyst of a vast public network, providing a wide array of information to everyone around the world. When it opened on 13 February 1980, at a special meeting of the European Parliament, it interconnected the national data networks of the nine member states[2] of the European Economic Community (EEC), enabling access to scientific, technical, social, economic and legal information through a network of about hundred databases named DIANE (Direct Information Access Network—Europe) ("Euronet starts in 1979," 1978).

Today Euronet has virtually vanished from internet history. The general public has no knowledge of its existence and it has only rarely been touched upon in historical research. While some of these studies briefly sketch its position in the history of early European projects in data networking, such as EIN (Badouard & Schafer, 2014; Schafer, 2009), others only mention it (Davies, 2010; Fickers & Griset, 2019; Martin, 2012). Why

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do we know so little about Europe's attempt to create a European internet? Finding answers to this question forms a through-line in this article, which serves the main purpose of making a theoretical and historiographical intervention in mainstream internet history. Through the history of Euronet, I will enact and theorize a *legacy systems* perspective as the theoretical fundament for a genealogical understanding of internet history, an alternative to the widely employed *legacy* perspective.

Within internet history, legacy perspectives tend to be associated with the history of winners, what internet historian Andrew Russell critiques as "stories of success and triumph" (Russell, 2017). Historical legacies are an important component of many explanations for why the contemporary Internet, and its culture, developed the way it did. Fundamental works in internet history have adopted legacy perspectives to portray the Internet as a legacy of a uniquely *American* past. These works mostly consider the Internet as an inheritance of, for instance, US funded research initiatives and cold-war politics (Abbate, 2003; Hafner & Lyon, 1996), American counter-culture (Turner, 2006), varying American romances with computer communication (Streeter, 2011), or American political and popular discourses on information highways (Flichy, 2007). By using a legacy perspective, these works thus trace the historical origins of *the* Internet to establish lineages of continuity that demonstrate how American pasts still operate in and affect our internetworking present.

This article, in contrast, attends to the discontinuities of internet histories. Inspired by media archaeology (Huhtamo & Parikka, 2011; Parikka, 2013), it aims for a more inclusive understanding of internet history, attentive to the historical conditions of possibility that gave birth to now lost, forgotten and obsolete networks. It moreover builds on a growing body of work that criticized the narrow framing of legacy histories and favours more inclusive historiographical approaches (Haigh, Russell, & Dutton, 2015; Russell, 2017; Schafer, 2015); is more receptive to missing narratives (Campbell-Kelly & Garcia-Swartz, 2013; Driscoll & Paloque-Berges, 2017) and accounts for "parallel and complementary projects or rivals" (Schafer, 2015, p. 218).

This study contributes to these works by rethinking the legacy perspective embraced in mainstream internet history, to investigate the internet also as a legacy of European pasts. Therefore, I make a distinction between the concept of *legacy* and *legacy systems*. In computer engineering, legacy systems refer to technologies that have been discontinued, by becoming obsolete (often due to technological innovation), but still have an impact on present organizational practices and technological constellations (Bennett, 1995). Their influence still exists either because they simply continue to be used (for various reasons, such as economic, technological, or other ones), or, in the case of discontinued use, because of their historical role. For example, a system's architecture and/or data format may have shaped organizational practices and processes in the past, which remains the basis on which newer systems are shaped and used.

A legacy systems concept combines attention for discontinuity—outdated systems—with continuity—their impact on present conditions. In this article, I deploy the concept metaphorically, serving also as a historical and methodological lens, to interpret and position the histories of lost, forgotten and obsolete European computer technologies and networks as products of European cultural, political and social

systems that still persist and continue to affect our digital present. To demonstrate its historiographical value, I will use the history of Euronet as a case in point to argue that it is a legacy system of European integration and cooperation, the socio-cultural basis on which the network was imagined and built, which persists within internet history through a variety of "successes" and "failures," of which Euronet is only one.

To investigate lost network events as legacies of European pasts, I will use a combination of primary and secondary sources. Secondary sources include scholarly works by historians of technology who investigated the co-construction of Europe through the lens of networked infrastructures. Primary sources include previously (often) neglected and under-researched corpora, containing traces of European networking pasts. To gain insight into the landscape of European computer networking, in which Euronet was established in the 1970s and 1980s, I studied the Dutch ICT trade-magazine *Automation Guide* (1967), aimed at ICT professionals in the Netherlands. To study Euronet's constitution within this context, I used a combination of sources, including official communications and reports from the European Commission, the Committee on Information and Documentation for Science and Technology (CIDST, responsible for its development); but also the published writings by historical actors directly involved in the development of Euronet, and a selection of news-bulletins and magazines oriented towards Europe, such as *European Community* (1963) and *Euroforum* (1976).

Euronet: a brief history of a "winner" that became a "loser"

Whereas the legacy perspective prefers a narrative of winners, the legacy systems perspective acknowledges more complex histories where notions of winners and losers have little significance. Only in hindsight, of course, can we identify Euronet as a failure. Viewed from the socio-political and techno-cultural context of the 1970s, however, Euronet was a success that turned its rival, the European Informatics Network (EIN), into a loser (Schafer, 2009). But distinguishing winners from losers is not relevant for a legacy perspective. Instead, it allows to investigate how the lost (not the losers) emerged as contingent on their historical environment, or what I refer to as legacy systems providing the conditions of possibility for lost computer technologies and networks to develop and emerge. In the following paragraphs, I will present a brief description of Euronet's history. As a first step to investigating the European legacy system from which Euronet emerged as a product, I will start by briefly discussing the techno-political context from which it developed. Furthermore, I will introduce the committee responsible for its development, and the aims and visions on which it was imagined and built.

In 1971, the Euronet project started when a resolution was passed by the Council of Ministers. [3] The resolution contained the first plans for the establishment of a European online information network with the aim to enhance the "coordination of the activities of Member States in the field of information and documentation in science and technology" (EC, 1974, p. 1). Although it specified several aims and objectives, the resolution did not mention the network's technological form, nor the kind of scientific and technical information it would connect. To carry out this work, the Council created the Committee on Information and Documentation for Science and

Technology (CIDST), which consisted of government representatives of the member states (Giles & Gray, 1975).[4] Four years later, in March 1975, the council of ministers approved a three-year action plan,[5] covering 1975–77, which was drafted by the commission in close cooperation with CIDST (EC, 1974). The plan authorized expenditures on the creation of the network's physical framework by a consortium of the nine PTTs (government-owned Postal Telephone Telegraph companies) of the EC member states (Gray, 1976). For Euronet, CIDST chose to handle data communications through the X.25 protocol (Dunning, 1977; Kelly, 1979), which was developed by representatives of the PTTs that took part in the Consultative Committee on International Telegraphy and Telephony (CCITT) (Abbate, 2003). Based on X.25, CIDST developed Euronet as an internetwork connecting the public packet switched data networks of the participating countries (e.g., the Dutch Datanet-1, the French TRANSPAC, and UKs PSS) by installing so-called switching nodes in Frankfurt, London, Paris and Rome, connected to remote concentrators in Amsterdam, Brussels, Copenhagen and Dublin (Gray, 1976).[6]

In order to promote the value and accessibility of information provided through Euronet, it was decided to separate the data communication network specified above, from the information service DIANE (Mahon, 1983). Although some of the large US databases would also be connected through Euronet, DIANE encouraged the development and connection of European databases relevant for the European research and technology industry (Huber, 1978). At the start of Euronet, it supplied over a hundred bibliographic databases, mostly in the field of science and technology (Campbell, 1979).[7] Additionally, it connected about twenty-five scientific and statistical databanks containing direct factual information and about twenty-five information services including the Space Documentation Service (SDS) of the European Space Agency, the Deutsches Institut fur Medizinische Dokumentation und Information (DIMDI) at Cologne and the British Library (Huber, 1978). Users with access to Euronet/DIANE, such as medical researchers, would be able to search in dozens of databases on "pharmaceutics, cancer, toxicology, hospital management and very large high-quality data bases such as the American Medlars," as explained by Director for Information Management at the EC, Professor George Anderla (Anderla, 1979). From the moment the network became operational in 1980, it showed a steady growth in the number of connected databases, subscribers and total usage. Its users shared some 40,000 hours of usage in 1981, and 60,000 hours in 1982, generated by approximately 2,500 subscribers (Mahon, 1983). Compared to the 100 databases in 1980, Euronet already provided access to about 400 databases in 1983, although still mostly focused on science and technology information.

Nonetheless, the intention was to serve a much wider audience than just the science and tech industry. The second plan of action for 1978–1980 aimed to change this and expressed the ambition to "turn Euronet into a public operational on-line information network" (EC, 1977). "Public" did not mean an open network, but rather offering data services to the public. Euronet's infrastructure was *closed* rather than *open* and gave the PTTs complete control over how and what kind of data moved through the network. Despite the closed infrastructure, the ultimate ambition was to expand and provide various kinds of information to everyone around the world. An amendment to a third iteration of the action plan (1981/1983), made by the European

Parliament, is furthermore illustrative, because it tasked the commission to delete the words "scientific and technical" as adjectives to information (EC, 1981a). It seemed a rather small correction, but this meant that the scope of the third plan now officially underlined that Euronet was to provide access to information of any kind. Besides broadening what was understood by public information, Euronet also continued to expand its geographical reach by integrating data networks of non-EC nations, thereby also extending the number of potential users it could serve.[8]

These ambitions were more strategic than idealistic, because the Council feared an overdependence on the United States for information distribution (Symonds, 1980, p. 3). Euronet was hence envisioned as a starting point and a catalyst of a networked European information community for everyone, "the nucleus for a vast future public data-transmission network in Europe" ("Euronet: Collaboration between the Commission and the Postal Administrations of the Community to establish a European data-transmission network," 1976).[9] As head of the launch team Barry Mahon wrote in 1980:

> the aim for the future [of Euronet] is that any person who wishes to obtain information will be able to make use of the most modern technical facilities provided as a public service to communicate with information service providers by voice, data or facsimile anywhere in the world. (Mahon, 1980, p. 5)

Euronet arose from a situation in which Europe was constantly lagging behind the United States, leading many developments of modern technologies (Anderla, 1979). With its development, Europe thus aimed to keep up the pace with international innovations in information networks to ultimately establish a "European public data network […] used for data transmission in the same way that telephone lines are used for voice traffic" (Anderla, 1979).

But the "network of networks" that would eventually enable this future vision of a global, public information service – the Internet – was not of European origin, nor did Euronet become its nucleus. With the rise of network technologies that made online and real-time data processing much easier, such as TCP/IP and internet technology, the X.25 networks that had shaped Euronet gradually lost their significance. The Dutch Datanet-1, for example, lost more and more users to the Internet in the 1990s, and its owner KPN (former PTT) decided to permanently pull the plug in 2008 (Wit, 2008).

Euronet: a lost internetworking event

Technologies developed in American research laboratories in the 1960s and 1970s such as ARPANET and TCP/IP, not Euronet, form the nuclei of *the* Internet, as influential legacy histories have argued (e.g., Abbate, 2001). These histories aim to understand the essence of the Internet's cultural identity by searching for its technological origins, establishing teleological lineages of continuity between pasts that are proclaimed as beginnings of the Internet's current manifestation. To conceptualize a *legacy systems* perspective as an alternative to such linear and teleological modes of historical reasoning, I build on Michel Foucault's genealogical approach to history:

> [w]hat is found at the historical beginning of things is not the inviolable identity of their origin; it is the dissension of other things. It is disparity. […] We want historians to

> confirm our belief that the present rests upon profound intentions and immutable necessities. But the true historical sense confirms our existence among countless lost events, without a landmark or a point of reference. (Foucault, 1978, p. 155)

A legacy systems perspective will direct attention to lost network events in the disparate landscape of computer networks in the 1970s and 1980s, what Kevin Driscoll and Camille Paloque-Berges describe as "the messiness of inter-networking" (Driscoll & Paloque-Berges, 2017, p. 51). Such messiness consists of many different beginnings, linked to many different technologies, some of which continued to exist, while others failed and became obsolete, lost and forgotten. A legacy systems perspective acknowledges that all networks, winners or losers, successes or failures, have interrelated histories, and emerge as the outcome of unique contextual conditions, aims and ambitions.

As briefly mentioned, the circumstances highlighted in mainstream legacy histories are those of American research laboratories out of which came ARPANET and TCP/IP in the 1960s and 1970s. In the influential book *Inventing the Internet* (2003), Janet Abbate portrays the Internet as "a product of its social environment" (p. 2). Abbate shows that the predecessor of the Internet, ARPANET, and its host protocol TCP/IP, were shaped by the military and academic environment from which they emerged in the 1960s and 1970s. Both military and scientific interests and objectives, she argues, were built into Internet technology resulting in a network design that reflected both military and academic values.

Surprisingly, these technological origins, foregrounded by Abbate, are conspicuously absent in European ICT trade-magazines, such as the Dutch *Automation Guide*, when they report extensively on computer networks in the 1970s and 1980s. The first serious article on TCP/IP, "Communicating offshore with TCP/IP" (Stiller, 1990),[10] is only published in April 1990 and reports on the increasing popularity of TCP/IP as a protocol for "internetworking." The first feature article on the Internet, "Internet: Founder of global village culture" (Vanheste, 1993),[11] is published even later, in June 1993. It discusses how a range of new applications (e.g., Archie, Wais, Gopher, and WWW) opened up the Internet, making it much more useful for the general public.[12]

How to explain this rather late reporting on those network technologies (TCP/IP and Internet), especially seen in the light of their status as key agents of change in shaping internet history? The most plausible explanation is that these network technologies had neither a practical nor a commercial relevance for the Dutch and European ICT industry in the 1980s. At this time, as Abbate points out, the Internet was still under military control, directly linked to defence research and operations. Although the balance shifted from military use to academic research in the course of the 1980s, with the National Science Foundation (NSF) installed as a controlling organization (Abbate, 2003), the net was still managed by a government agency and served non-profit research and educational purposes. Only with the Internet's privatization in the early 1990s, as Abbate describes, the network was "opened up to a much larger segment of the […] public, and using it for purely commercial, social, or recreational activities became acceptable" (p. 199). Only at this point, with the Internet emerging as a commercial space to which private companies could connect, did it become clear that this "network of networks" had a potential use-value and commercial significance for Dutch organizations and Dutch ICT professionals, the readers of the magazine.

Another explanation for AG's late reporting on the Internet is that the magazine was deeply involved in reporting on the messy emergence of a Dutch and European landscape of computer networking in which the Internet appeared as only one of many approaches to (inter)networking. As network historians Badouard and Schafer point out, "Europeans did not wait for the Internet to enter network history" (Badouard & Schafer, 2014, p. 2). It is equally important to realize that not all people involved in building, promoting, and reporting on computer networking in the 1970s and 1980s, "were […] seeking to build a commercial network of networks that spans the globe" (Haigh et al., 2015, p. 144). Various European efforts to develop and establish networks occurred in parallel to networking innovations that directly led to the emergence of the Internet. Throughout the 1980s, AG reported on dozens of such networks, developed and used in varying contexts, for very distinct purposes. Amongst bigger and better-known networks, such as Viewdata and Videotext, AG informed its readers about smaller and lesser known nets, such as SURFnet, Modanet, COMnet, Catharijne-net, Travel-net, Beanet, Geis-net, Infonet, GBA-net, VeeNet,[13] and Euronet.

In the context of today's global Internet, all of these past networks can be considered "lost events" in terms of Foucault—events in the history of computer networking which, unlike ARPANET or TCP/IP, do not have the present Internet as "a landmark or a point of reference" to which their histories can be meaningfully connected (Foucault, 1978, p. 155). While this means that it is useless to judge such projects "teleologically in the shadow of the Internet's 'success'", there is ample value in investigating them "as products of their own distinctive circumstances" (Russell & Schafer, 2014, p. 881). In line with this belief, various internet historians have already studied the contextual development, use and endings of specific European computer networks, such as the study of the European Informatics Network (EIN) (Badouard & Schafer, 2014), Louis Pouzin's Cyclades network in the 1970s (Russell & Schafer, 2014), RENATER (Schafer, 2015), the French Minitel (Mailland & Driscoll, 2017), and the Italian Socrate and Iperbole projects (Bory, 2019).

Similar to the European networks mentioned above, Euronet is an example of a lost event—a European computer networking effort that does not fit the dominant narrative of linear progress towards the Internet, and an important story missing in internet history. It is, however, not the aim of this article to add yet another European network to this list, only for acknowledging its existence. I would like to stress that the legacy systems perspective, as a conceptual basis for a genealogical framing of internet history, does not result in more encompassing and truthful histories of computer networking by incorporating the histories of lost network events. If it would, the notion of legacy would become superfluous. Instead, as mentioned earlier, it aims to meaningfully position lost, forgotten and obsolete (European) computer networks as distinct products of European cultural, political and social conditions that persist and continue to affect our networked present.

The choice to focus on Euronet, then, is motivated by its distinctiveness. It is important to recognize the difference between Euronet and the other European networks I mentioned. Minitel allowed access to the French Transpac network, which was a "*singular* telematics network" (Mailland & Driscoll, 2017, p. 56). RENATER, in contrast, was a singular network existing within the "network of networks" (Schafer, 2015).

Euronet's physical infrastructure, however, was essentially *multiple* in nature. First and foremost, it was an effort to *interconnect* stand-alone data communication networks of the EEC's member states into a network of networks through use of X.25 (Kelly, 1978). In short, Euronet's development was about constituting an internet. While *the* Internet emerged as contingent on military and academic environments, Euronet emerged as the result of a distinctive European political environment, characterized by integration and collaboration—principles that continue to shape internet history.

Euronet: a product of a European legacy system

I will now exemplify my legacy systems perspective by demonstrating how Euronet emerged out of the intersection of two interconnected environments. First, it developed out of a historical context in which PTTs monopolized telecommunications. To maintain control over networked communication, PTTs adhered to a vision of decentralized (not distributed) network control that materialized in X.25. Second, and more importantly, Euronet developed out of the European political environment of the EEC. More specifically, it formed the product of the cooperative spirit driving European politics of integration. The EC designed and used Euronet to constitute and enact European unification by shaping Europe as an information community.

From its very beginning in 1971, Euronet was intended to function as a catalyst for developing a European standard for communication in computer networks. The X.25 standard was chosen by CIDST to handle data communications through Euronet (Dunning, 1977; Kelly, 1979). Importantly, CIDST pushed aside the datagram solution (which Americans Vinton Cerf and Robert Kahn later adopted in their development of Internet's Transmission Control Protocol), which was preferred by computer scientists, and deployed in the European Informatics Network (EIN), which developed in tandem with and as a rival of Euronet (Schafer, 2009). As others have argued, the materiality of X.25 reflected a social environment that foregrounded PTTs control of telecommunications (Abbate, 2003; Russell & Schafer, 2014). X.25 made use of virtual circuits, the data communication approach favoured by PTTs. Compared to datagrams, which allocated control to clients, virtual circuits offered more control over the network on the server side, by concentrating control in a very select amount of switching nodes (Abbate, 2003). The powerful PTT industry preferred this mode of control to maintain their longstanding monopoly position over communications networks. By employing the virtual circuits approach used in X.25 (and not datagrams), I argue that Euronet can be seen as a legacy of a longer history of building telecommunications networks in which control resides on the server side of PTTs.

But it would be incorrect to imply that it was the sole objective of the European commission to have PTTs maintain their power over communications. First, the development of the X.25 standard occurred largely independent from the work of CIDST, because X.25 was developed in 1975 by a consortium of PTTs organized in the Consultative Committee on International Telegraphy and Telephony (in short CCITT). Let it be clear, there is no doubt that PTTs played a big part in Euronet's creation. They financed a large part of its infrastructure and it is probable that their powerful lobbying efforts played a key role in the materialization of the network. Besides the

political, however, it was also a *pragmatic* choice for the EC to co-operate with the PTTs and use their proposal for an X.25 based network design. As mentioned, the fear to become too dependent on US information networks, compelled the commission to act quickly and to adopt already established organizational and technical infrastructures (Dunning, 1977). Moreover, the PTT politics inscribed in X.25, tell us little about the distinctive political circumstances that motivated the EC to start with the development of Euronet in the first place.

But how do we capture the *European political* dimension of Euronet and understand it as a legacy of European politics? To answer this question, I align with Andrew Russell and his proposed shift towards an even broader conceptual frame: from internet histories to "histories of networking" (Russell, 2017, p. 16). As Russell points out, histories of networking also include histories of railroading, telecommunications and electricity, to name only a few. Connecting with such histories, internet historians can engage with, learn from and draw upon accounts that "do not deal with computer networks" (Russell, 2017, p. 20). Taking up Russell's suggestion, I will continue to investigate the political underpinnings of Euronet by drawing upon works by historians of technology who investigated the co-construction of Europe and networked infrastructures (Hogselius, Hommels, Kaijser, & Vleuten, 2016; Kaiser & Schot, 2014; Misa & Schot, 2005; Schipper & Schot, 2011; Vleuten and Kaijser, 2006). In doing so, I argue that a European collaborative spirit and political vision of integration formed the legacy system upon which Euronet and other European network infrastructures were imagined, built and maintained.

Starting with Misa and Schot (2005), the shared goal of these works, which all developed from the *Tensions of Europe* (ToE) project,[14] was to investigate what Schipper and Schot refer to as *infrastructural Europeanism*, or "the project of building Europe on Infrastructures" (Schipper & Schot, 2011). By investigating networked infrastructures as agents of change that shaped European unification, the ToE project challenged dominant perspectives on the making of Europe in the field of European integration history. Political scientists developed many established accounts of European integration by focusing on how a unified Europe took shape as a political entity due to visionary leaders and politicians who negotiated treaties (Misa & Schot, 2005). The ToE project aimed to make visible how material networks, infrastructures and technical systems since at least the 1850s shaped and supported European integration through "processes of simultaneous transnational network and society building" (Vleuten & Kaijser, 2006). Studies focused in particular on large infrastructural systems that fulfilled a general function in society by enabling movements of people, goods and information, and that were publicly accessible, such as railroads, electricity supply networks, or motorway networks (Kaijser, 2003). Euronet fits seamlessly with the infrastructural systems focus. It aimed to facilitate the movement of information between the member states of the EU and was envisaged as a public network.

Even though ToE research has paid little to no attention to the creation of computer networks in the European context,[15] its research provides an interpretive frame for understanding Euronet as a product that was shaped by, and which helped to shape a larger project of European integration. Most insightful is the way in which ToE research shows how networked infrastructures were key to a unification process

named "hidden integration" (Misa & Schot, 2005). With this notion, Misa and Schot hinted at a more implicit and concealed type of integration that was pursued through the development and linking of transnational infrastructures rather than something engineered by visionary leaders in the spotlights of the political arena. This more implicit European political and cooperative endeavour, I argue, can be seen as a legacy system upon which networked infrastructures (including Euronet) were imagined, built and maintained in order to ensure networks constituted, enacted and contributed to the unification of Europe.

Reports by the EC and CIDST on the development of Euronet in the 1970s, convey clear visions of a unified Europe—not only in political and economic terms, but also in terms of a transnational community united through the provision of information. As illustrated by this excerpt, the development of Euronet, as a physical infrastructure, supported and was supported by, a strong vision and concept of a future Europe as an information community:

> A simple computer terminal will enable any hospital in Italy, for example, to inquire about the research work undertaken in Brussels, or will enable a German steel works, for example, to acquire information on a particular metallurgical problem. In a similar way, it could enable an economist in France to draw on British statistics. (Pirlot, 1977)

In 1978, Barry Mahon, head of the Euronet launch team, stated that "Euronet is a conglomerate term designed to describe a *concept* [emphasis added]—the sharing of information resources in the member states of the European Community" (Mahon, 1978, p. 416). Moreover, the Euronet project was not initiated as an isolated case, but was envisioned as a "first tangible European-wide step in a longer-term plan designed to harmonize the provision of information services to all peoples in all member states" (Mahon, 1978, p. 69). In that sense, I argue that Euronet can be seen as one of many more networked infrastructures that formed products of European integration politics.

But the concept of *hidden integration* didn't only refer to the study of those forces contributing to European unification left undiscussed by European integration scholars. The term also referred to forms of integration "which were (and are) not obvious to ordinary citizens of Europe" (Kaiser & Schot, 2014, p. 5), even sometimes deliberately hidden "from the gaze of politicians and the public" (Badenoch & Fickers, 2010, p. 20). Kaiser and Schot argued that committees functioned as sites at which experts negotiated technological solutions and political ideas behind closed doors, hidden from public view (Kaiser & Schot, 2014). This was also the case with Euronet. The networks' conceptual and physical development was controlled by CIDST, out of the sight of the general public. Only in the late 1970s would the general public read about Euronet in trade magazines such as AG when it started reporting on the forthcoming launch of the network in 1978 ("Euronet starts in 1979," 1978).[16] However, at this moment CIDST had already been working on its development for almost a decade. Moreover, in the period between 1979 and 1983, AG only published four articles on the Euronet project.

The fact that Euronet was created out of the sight of the public, almost exclusively documented in non-public EC reports, only partially explains why we have little to no knowledge of its existence. There is another explanation—one that much more directly points at the political nature of the Euronet project. In 1983 AG published its fourth but also last article on Euronet, never writing about it again. How so? Euronet, as

it turned out, quickly ceased to exist as an internetwork controlled by the EC. As foreseen by its creators, in 1984, the commission handed over control of Euronet to the consortium of national PTTs who operated the network under the same economic and technical conditions (CIDST, 1986; Mahon, 1983).[17] Importantly, the end of Euronet was not caused by competition from other networks, or by the eventual demise of X.25 with the acceptance of TCP/IP as standard internetworking protocol—this happened much later, in the early 1990s. Euronet's end was already part of its design. It was planned to become obsolete and was never intended to exist as an autonomous internet.

A 1981 article, published in AG, corroborated this view, in a report on a remark made by the Director for Information Management at the EC, and the project lead of Euronet, Professor George Anderla:

> Professor Anderla argued that the intention of the EC was never to let Euronet continue to exist as an independent facility. It has only been an initiative to act as a catalyst for the national PTTs, to stimulate the development of own networks and to achieve European standardization ("European Commission opens news offensive," 1981)

Euronet, as a technological project and catalyst of technical standardization, I believe, cannot be seen independently from Euronet as a product and legacy of the much longer political project of European integration and collaboration. Put differently, technological integration through X.25 supported political integration by making national data and communication networks "signify in terms of Europe" (Badenoch & Fickers, 2010). Once this objective was completed, Euronet ceased to exist; not its physical infrastructure, but the political project of integrating national networks into a European internet unified through X.25.

Conclusion: towards an internet history of European legacies

This article appropriated the legacy systems concept from computing and used it as a conceptual ground for a genealogical framing of internet history. Therefore, I made a distinction between the legacy systems perspective and legacy perspective. Fundamental works in internet history have employed legacy perspectives to establish lineages of continuity that demonstrate how *American* pasts still operate in and affect our internetworking present. These legacy histories, such as Abbate's *Inventing the Internet*, Russell points out, "clearly sit [...] more comfortably into a genre of 'success story' than 'failure story'" (Russell, 2017, p. 17). Drawing inspiration from media archaeology and Foucault, the legacy systems perspective proposed in this article started with foregrounding those computer networks that failed, became obsolete, were lost and forgotten. This was done to establish non-linear and non-teleological histories.

I used the history of the lost European internetwork Euronet as a case in point for demonstrating the relevance of the legacy systems perspective. Euronet ceased to exist in the 1980s, but nevertheless persisted as a legacy, a lost internetworking event and product of a European cultural, political and social legacy system, which still operates in and affects our digital, online present. Using the legacy systems concept as a historiographical lens, I investigated which contextual environment(s), aims and ambitions provided conditions of possibility for Euronet's emergence. In other words, I did not study the legacy of Euronet itself, but investigated the extent to which the

historical conditions of its production operated as a legacy system. By situating the computer network in relation to particular circumstances of production, the concept of legacy systems draws attention to circumstantial traits that continue to leave a mark on the development of computer technologies and networks.

Euronet emerged at the intersection of technological and political circumstances shaping the birth of the network. I identified two legacy systems underpinning Euronet. First, the technological vision of decentralized network control promoted by PTTs, and second, the European cooperation and integration politics of the EEC. Importantly, both of these legacy systems persist within internet history through a variety of "successes" and "failures," of which Euronet is only one. Rather than emphasizing the PTT's control architecture of computer networks, I focused more explicitly on the less studied legacy system of EC politics, characterized by cooperation and integration. As I have shown, a European political vision of integration through cooperation formed the legacy system upon which Euronet, and other European network infrastructures (e.g., railroads; highways; electricity systems) were imagined, built and maintained. As a political process, Euronet contributed to building Europe as information community by making national networks signify in terms of Europe.

Understanding Euronet also as a legacy of the European political system, allows for the positioning of this lost internetworking system as part of a much longer and multifaceted historical lineage of (to be) lost and (not yet) forgotten events in internet history that developed from a distinctly European political context. The article thus offers a non-teleological genealogy that, when taking Euronet as a centre of gravity, rather than origin, shoots out into the past and the future. This genealogical history could hence, for example, connect Euronet with a host of other techno-political projects initiated by the EC after it had successfully handed over control to its member states. It is safe to assume that the cooperative spirit of Euronet promoted long-term partnerships between European countries and companies on a mission to shape a future information society that gave Europe a leading role. For example, in 1981, only a year after the launch of Euronet, George Anderla announced that the EC was working on a new European network initiative named INSIS (Inter Institutional Integrated Services Information Network). INSIS was envisioned to integrate all modes of communication (telephone, telex, facsimili, computer) into a single communications network (Anderla, 1981). The legacy of Euronet's cooperative spirit is also visible in the integrative approach to the development of European information technologies in the 1980s, as was the case in the first large-scale European research program ESPRIT (European Strategic Program on Research in Information Technology). Like Euronet, ESPRIT was created to respond to international ICT developments, with leading roles for the US, and later Japan. It represents yet another example of cooperation between EC member states in developing European ICT technologies (e.g., microelectronics; software technologies; office systems). Although the project did not result in any groundbreaking technological innovations, it was generally considered a "successful example of intellectual and strategic cooperation at a European level" (Meurs et al., 2018).

This genealogical history could also connect Euronet with more recent developments, such as how Europe's cooperative spirit manifests to counter the power of large US tech companies. Maybe more so than ever before, today's Internet functions as a key site for

European Union (EU) politics. With GDPR, and Articles 11 and 13, passed by the European Commission, Europe operates as an agent of change writing today's internet history. Take for example more recent projects such as Europeana, the EU's large-scale digitization project of European heritage, developed as a response to Google books (Thylstrup, 2011). We are witnessing internet history being made, and it is the EC that is making it, as was the case many years ago. So far, such European contributions have been marginalized by US-centred internet histories. The legacy systems perspective proposed here, makes internet history a slightly more multifaceted and inclusive, encouraging historians to investigate internet history also as a legacy of European and other non-Western pasts.

For a history that is as often seen as distinctly American, it is all the more important to reveal that internet history has also been made elsewhere in the world. This article emphasized the need to start writing histories that take the Internet's existence as result of a countless number of "lost events" for which no role has been assigned in any linear and teleological internet history. However, it is precisely at these instances and internetworks where the Internet is not the teleological point of reference, where new insights emerge. The contextual conditions described and analyzed in this article, linked distinctly European interests, visions and objectives that were contingent to particular projects. At the same time, it argued that these conditions recurred as they also provided conditions of possibility for other technologies to emerge in the rich and messy European history of computer networks.

I used the history of Euronet as a case in point, using a variety of primary and secondary sources, to describe the legacy system of European cooperation and politics on which Euronet was imagined and built. Therefore, the analyses focused on the context of its production. Yet it might be equally relevant to investigate the "contexts of use," to investigate conditions specific to the European context which continued to affect uses of computer technologies and networks. Moreover, to develop an even sharper picture of the legacy of Euronet and other European innovations, it is essential to work towards more detailed histories, such as oral histories and perform more in-depth readings of primary and other relevant sources. In particular, the uniquely European endeavor to establish public service internetworking, as an integral component of the European legacy system, could be a worthwhile avenue for further research.

Regardless of the specific approach taken, however, it is key to tap into archives beyond those that are "rich with recollections of ARPA and Internet insiders such as Vint Cerf, Larry Roberts and Leonard Kleinrock" (Russell, 2017, p. 18). What European network histories need are recollections of insiders of European networking efforts, which have hardly been recorded. Moreover, internet historians need to find, open up and study the traces of European networking pasts that exist within mostly neglected and little researched corpora. This article made the first steps towards such research. Hopefully, more internet historians will delve deeper into the various European ICT trade magazines that have existed. Or benefit from new insights derived from the archives of the European Commission, which have recently become accessible online.

Notes

1. I use the term internet here in its generic sense, referring to a computer network comprising or connecting a number of smaller, in this case nation-specific, data communication networks through a standard protocol, in this case X.25.

2. The nine-member states are Belgium, France, Italy, Luxembourg, the Netherlands, Germany, Denmark, Ireland and the United Kingdom.
3. The Council of Ministers forms the body that makes the decisions within the European Economic Community. The Commission of the Community makes propositions upon which the Council decides. These proposals are documented in official reports that have been archived by the historical archives of the European Commission.
4. In its first three years CIDST was chaired by Mr C.G. Giles from the United Kingdom The names of all committee members are published in the six reports CIDST published between 1973 and 1986. All of these reports have been archived by the Archive of European Integration (AEI) http://aei.pitt.edu/. These reports informed the European Commission and formed the basis for all three action plans proposed by the commission to the council. Much of the work in the first years of CIDST was subject-based and aimed to examine information needs and existing information resources in various subject fields such as agriculture, medicine, environment, patents, metallurgy.
5. Action plans form one of the mechanisms by which the EEC manages projects. They can be seen as "budgetary envelopes approved by the Council of Ministers which permit expenditure on projects in a defined sphere of activity" (Mahon, 1980).
6. For a detailed specification of the technical characteristics of Euronet see (Kelly, 1979).
7. Databases offered bibliographic information and referred users to a document or documents containing which information of potential relevance to his needs. The databases covered a information from medicine and chemistry to social and economic information (Huber, 1978).
8. The commission proposed to add several non-EC members to Euronet, Switzerland in 1979 (EC, 1979), Sweden in 1981(EC, 1981b), Finland in 1982 (EC, 1982), and Austria in 1984 (EC, 1984) and planned to connect Yugoslavia, Norway and Greece in the following years (Kelly, 1979).
9. See also other statements that indicate similar visions of publicness: 'the door to an all-purpose public service network for Europe in the early 1980s' (Gray, 1976); one that 'may transpire to be the embryo of a future international public data transmission network in Europe' (cite EC report 1973? Dunning, 1977).
10. Translated from the original Dutch title "Buitengaats communiceren met TCP/IP".
11. Translated from the original Dutch title "Internet: Aanstichter van mondiale dorpscultuur."
12. In the early 1990s discussions about internetworks in the Automation Guide do not centre on the Internet, but on the construction of data (super)highways, or what media historian Patrice Flichy characterized as "the information highway utopia" (Flichy, 2007, p. 20). It is only from 1994 onwards that reporting on the Internet increases exponentially. Examples of other articles published in the AG which centered on the Internet are, "Internet: virtueel doolhof of machtsfactor van de eerste orde' (15 July 1994); "Internet ook voor de bloemenzaak op de hoek" (23 September 1994).
13. Cattle-net in English.
14. See https://www.tensionsofeurope.eu for additional information.
15. Euronet is briefly discussed in the last volume of the ToE book series, *Communicating Europe:technologies, information, events* (Fickers & Griset, 2019). My explanation for why ToE works have had so little to say about Euronet is that they circumvented the study of computer networks altogether. When the ToE project took off in 2003 discussions about the rise of the information age—which gathered so much attention from the mid-1990s onwards—centred on computer networks, most specifically the Internet. ToE research developed out of desire to show that Europe was built on a much more diverse and broader set of linked infrastructures than the global and distributed computer information networks that were positioned at the heart of what Manuel Castells named *The Network Society* (Castells, 1996). Indicative in this respect is the fact that ToE research built on the Large Technical Systems (LTS) concept of network (rather than any computer network concept) as developed by historian of technology Thomas P. Hughes in his 1983 book *Networks of Power*.

16. Overall, very little was publicly reported on Euronet. The amount of articles published in magazines more directly linked to the EC, such as *European Community* (1963), *Europe: Magazine of the European Community* (1979), and *Euroforum* (1976), can be counted on one hand.
17. Already in the December 1975 agreement between the Commission and the PTT's of the nine Community countries it was agreed that the PTT's could eventually "take over the facilities as a public network after a given period of years" (Mahon, 1980).

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