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A New Numbering Plan Intended to Develop a Telephone Network

Abstract

The 25th of October 1985, France numbering telephone plan was transformed from seventy telephone zones to two in just one night. The computerisation of France was highly promoted but the Telephone network was quickly running out of numbers. We analyse this overnight event as an infrastructural event and the biggest update in telephone history. It market a crucial step in the direction of network as a service, turning telephones into terminal while network fade in the background. By doing so, we insist on the historical specificity of what was a technocratic event, an innovation process with a highly closed script.

Keywords

Introduction

The image below (see Figure 1) is from a 1985 public information campaign that targeted the French public. This campaign announced a significant change to the French telephone numbering plan, whereby the seventy existing zones within the country would be reorganised into just two zones overnight. There was uncertainty regarding whether existing telephone users, as well as the 50 million potential subscribers in France, would adopt the new numbering system. For over a decade, computerisation had been promoted in France;[1] however, the existing telephone network was quickly running out of numbers. The implementation of a new numbering system may seem like a rather mundane event, and it has largely gone unremembered, particularly because the changeover to the new system went smoothly on that night. However, it *should* be remembered as one of the most comprehensive telephone system overhauls in history.

2 ZONES INSTEAD OF 70.

The existing numbering plan.

The new numbering plan.
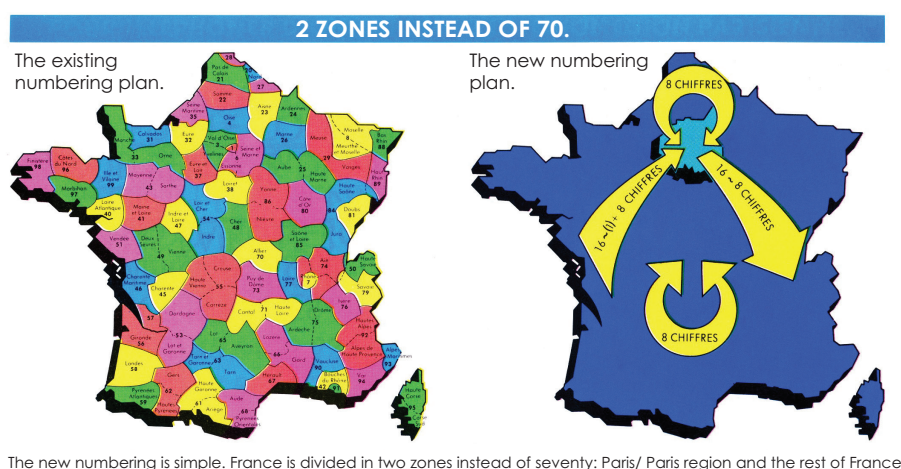
The new numbering is simple. France is divided in two zones instead of seventy: Paris/ Paris region and the rest of France.

Figure 1. French telephone numbering map. Source: Ministre des Postes et Télécommunications, "Aide-Mémoire - La Nouvelle Numérotation Téléphonique NNT2," Courtesy of Claude-Rizzo Vignaud, accessed July 2, 2023, https://drive. google.com/file/d/1c2I-h9wGOGZbWK1y2XuXgc1MI_8PrDvk/view.

The primary purpose of the new numbering plan was to double the capacity of the existing telephone network and generate 50 million new numbers to meet anticipated demand well past the year 2000. The system had to be transformed all at once, and it required overcoming the difficult challenge of avoiding a service interruption. In this article, we highlight how, during this infrastructural event,[2] a new numbering plan was invested as a potential industrial success for the transformations of telephone networks in 1980s France. We illustrate how upgrading telephone networks meant engaging the nation in an infrastructural event that shaped the future role of telephones in French society. As Amos Joel, a famous switching engineer from American Bell Labs, recalls, 'Plain old telephone service means different things to different generations of people'.[3] In this context, how did a new numbering plan shape French telephone networks and their users?

For the adoption of a new system to be a success, every existing telephone user and telephone technician had to participate in this process, which involved the interplay of old and new technologies. This sudden willingness in the 1980s within the telephone industry to undertake such a large infrastructure project has been studied as an example of the industry's capacity for innovation and dynamism, especially in the face of administrative foot-dragging.[4] We analyse this night in 1985 as an infrastructural event in French telephone history and a crucial step toward the adoption of the modern-day network-as-a-service approach.[5] The introduction of a new numbering plan marked a fundamental step toward turning telephones into terminals, and it changed how networks are managed and controlled.

The following section begins with a description of the materials and methods used in this study. Next, we explore the history of telephone numbering schemes. Subsequently, we focus on the 15-year period leading up to the adoption of a new numbering plan in 1985. This allows us to examine the key concepts involved in preparation for its operation and explore relevant technological advancements while highlighting the sociotechnical aspects of the new numbering plan. We then present a chronological analysis of the overnight update. Finally, we conclude by discussing how telephone infrastructure became a new ground for future network services. This facilitates a telephonic approach to the history of the internet[6] within the broader context of 'service as a cultural technique.'[7]

Materials and method

Empirical sources

This article focuses on the period from 1975 to 1995 in France, during which time the state sought to implement a new numbering plan. In 1975, French President Valery Giscard d'Estaing declared improving French telephone[8] infrastructure to be a national priority, and he implemented several government telecommunications plans. By 1985, the divestiture process of AT&T in the United States had nearly been completed; the French telephone network, however, was still under the monopoly control of the General Direction of Telecommunications (DGT).[9] In this context, we searched French Government archives and the DGT archives with the explicit goal of identifying technical reports, documents related to telephone switching,[10] interviews and meeting reports. Because the adoption of a new system was a mass public event, we also surveyed popular media, including archived French television shows, national newspapers and telephone-related magazines. Important documentation was also identified by a historical archivist at Orange,[11] the company that succeeded France Telecom. Two main players in the implementation of the new system[12] , as well as the operational director of France Telecom,[13] have published books. Advertisements from that era alone cannot fully encapsulate the 'full social imaginary of an evolutionary turn'[14] in the history of telephones. However, they played a crucial role in setting the stage, and therefore, we examine them here as a significant source for shedding light on the telephone as a sociocultural artefact in the 1980s.[15] We focus on the objectives associated with the conception phase of advertising in this context.

Methodological framework

In science and technology studies, this overnight event can be understood as an atypical case in the history of innovation. Infrastructure and technical innovations are often analysed during their conception or in the event of a breakdown.[16] In 1985, telephone users were to be kept out of any 'reinvention'[17], emphasised in other cases by looking at 'the core set of interactions (negotiations) that shape simultaneously the technology, its uses, and users.'[18] The implementation plan for the new numbering scheme had to be followed by all citizens on a national scale. We trace the conception of this plan in connection with the sociotechnical constraints of telephone networking in the 1970s and 1980s.

This telephone system transformation in 1985 was the first transformation at such a large scale in global history. Although other countries were also considering implementing a new numbering system, Belgium, which overhauled its system in 1974, was the only country to precede France.[19] The concept of an infrastructural event emphasises the role of infrastructure in enabling or hindering significant developments. As previous research has indicated, infrastructure narratives involve a dynamic interplay of revealing and concealing.[20] We argue that after 1985, the new telephone numbering system became a new ground for telecommunications. In the process, switching equipment transformed from an analogue to digital technology, establishing a path to telecommunications as a form of ever-changing infrastructure.

In France, the adoption of a new telephone numbering scheme was part of an international initiative. Writing in the context of the United States, Kevin Driscoll states, 'By enforcing a universal numbering scheme across the network, telephone users from around the country could imagine themselves as members of a single integrated system'.[21] Building on these findings, this essay explores the new numbering plan in France as a case study illustrating the country's intention to establish a single integrated system in a national monopoly context. To achieve this goal, the new numbering plan was presented as both a technical necessity and a significant advancement. It was conceived of and implemented in a top-down manner with no room for reinvention from the bottom up.

Historical background

A user, a phone and a network: the telephone network problem

This section begins by considering the sociotechnical constraints of telephone numbering systems. As Brian Hayes writes, 'Who could have guessed, as the millennium trundles on its close, that we

would be running out of numbers? That was one resource everyone thought was infinite'.[22] Why did this problem regarding telephone infrastructure emerge in the 1980s? Although telephone numbers may appear to be random combinations of numbers, they, in fact, possess a structure related to the physical layout of wires within the switching equipment. Telephone numbers embody the geographical topology of the network and local telephone exchanges. Thus, numbering plans shed light on the interplay between the geography of networks, on the one hand, and equipment and socio-material practices, on the other hand.

Electromechanical switching machines were made up of rotating parts and relays. A rotating cylinder moved inside the switch and selected the number that had been dialled in a step-by-step process. Hayes writes, 'Each time the electromagnet received a pulse of current, it advanced the arm by one position'.[23] The dial on the telephone transmitted short electrical pulses that indicated each dialled digit: '[I]f you wanted to dial a 7, you pressed a button seven times, thereby sending seven pulses of current to the electromagnet driving the selector arm. The push buttons were soon replaced by a rotary dial, which automated the counting of pulses'.[24] Once a call had been established, the switching equipment associated with the respective phone number 'could serve only one communication. They remained therefore affected to him as long as it was necessary'.[25] Switching research focused on concealing the connection processes from phone users in order to bypass the need for a manual operator. The aim of these machines was to enable subscribers to transmit instructions to the telephone exchange simply by rotating the dial on their telephones.

Before automatic switching was introduced, every telephone subscriber picking up their telephone had to make a verbal request to an operator to transmit their call.[26] The operator would physically plug one line into another on the switchboard.[27] Phone users often had to wait for an operator to become available, and waiting times varied depending on the amount of phone traffic throughout the day and the size of the switchboard. In large urban areas, a single telephone exchange was insufficient. Calls between central offices were completed by operators, leading to varying telephone bills depending on the distance. Speaking about the United States, Driscoll writes, 'Dialing out … required a mental calculation of distance, time, and cost.… It might be free to call your son's school downtown but cost five cents a minute to call your friend across the state and twenty cents a minute to call Uncle Larry in Walla Walla. Accidentally ringing up a massive bill was, unfortunately, a common experience for many new modem owners'.[28]

The French numbering system was first designed in 1955, and it was implemented gradually during the post-war period when economic and material resources were scarce. At that time, there were only 2 million telephone subscribers in the entire country, and the system could handle a maximum of 25 million phone numbers. This plan followed the departmental numbering; it had 80 different numbering zones, with each number receiving a two-digit code. There were regional numbering zones that included several departments. Within the same regional zone, subscribers called each other by dialling a subscriber's individual six-digit number. Each subscriber also had an eight-digit national number that could be dialled when calling across regional zones. It was a dual numbering system, with each subscriber having two numbers. It sought to ensure that subscribers dialled as few digits as possible. This was intended to enhance convenience as well as reduce the need for electromechanical equipment, as more numbers required more equipment. For instance, 100 ongoing communications occupied 100 different routes. In contrast, through electronic time-division processes, multiple conversations could be handled using the same physical medium within the exchange due to the principle of time-division multiplexing. Electronic switching enabled a greater number of communications to be processed with fewer machines. In November 1979, the final remaining urban manual switching centre was closed. By 1985, most electromechanical and semi-electronic machines used spatial switching technologies. The new numbering plan built upon these long-term transformations in order to construct a unified network by inscribing it in a different way in France of the 1980s.

Fifteen years in the making: a technocratic change in telephone networks

This section examines the 15-year preparation period leading up to 1985 and the tension between this national changeover, which required the entire citizenry's willing participation, and the new numbering plan, which was intended to respond to technical concerns. This tension encapsulates the challenge faced by telecom actors in France – that is, the question of how to seize on the new numbering plan as an opportunity for telephone growth. As the director of the public agency chosen to lead the public information campaign surrounding the project recalled in 1986, the goal was 'to transform a change that was perceived as an imposed decision of a technocratic nature into a forward-looking, warm, and popular operation'.[29] In this context, 'technocratic' refers to a process that is top-down and the organising of technical ensembles in terms of their external purposes regardless of local adjustments and the technician in charge of the relations of interconnections

between the technical individuals.[30] We first examine how the new numbering system was inscribed in a series of political decisions intended to support telecommunications development. We then argue that the new numbering system helped construct a unified network.[31] Finally, we conclude with an examination of how the public was engaged in the transition.

The end of incremental change: 'a telephone for all' as a leverage effect

In the 1970s, the French General Directorate of Telecommunications was often quoted by the media as using the humorous phrase 'the great French telephone delay' whenever discussing telephones.[32] This phrase reflected the backward nature of the French telephone system, which would soon be replaced. Under the original telephone numbering system, it was easier to call the United States via international telephone exchanges than to make a call to Paris; this was a dramatic representation of how France lagged behind other foreign powers. Indeed, there was a common joke during this time: 'Half of the French wait for the phone, and the other half wait for the dial tone'. In France in 1975, the average time it took to connect to the telephone network was 18 months. In 1980, it had dropped to 15 days.[33] Even up until the 1970s, in France and other countries, it was customary for companies to wait for a certain number of subscribers to amass in one area before installing telecommunications infrastructure, as they wanted to guarantee a return on their investment.[34] However, the 1980s witnessed a substantial change in thinking. Indeed, the DGT abandoned incremental changes and declared that 'investing is the keyword for the years to come'.[35] A total of 120 billion francs were invested by the French Government to expand the telephone network.

The idea that France is in decline and lags behind other industrialised countries is 'far from new'.[36] The theme of delay functions as a mirror reflecting the discourses that promote the need to innovate. This paradigm was used to build a common basis for accelerating innovation during the debates surrounding 'the battle of the telecoms', a process that Marie Carpenter[37] traces in her extensive research. Carpenter focuses on the transformations that DGT Director Gerard Théry sought to make possible in defiance of what is described as the weight of the French state administration. According to Carpenter, the fact that postal services and telecommunications still belonged to a single company contributed to the significant delay in telephone progress. This perspective was inspired by the ideas of sociologist Michel Crozier,[38] who has written about bureaucratic organisations as sterile organisations that cannot correct themselves. Progress toward updating the

telephone system has, therefore, been interpreted as a victory against the national monopoly. These readings also reinforce the vision of telecommunications as a sector of economic dynamism and a more horizontal society, as many speeches since the 1980s have affirmed, arguing for the need to liberalise all productive sectors. Meanwhile, in the 1980s, promises regarding fax technology, remote meetings via teleconferencing the contemporary mobile networks began to emerge. Jacques Darmon and others[39] started to present the telephone as an essential element of modern life: 'To communicate is today an essential need'.[40] Throughout the 1980s, advertising campaigns for France Telecom were intended to stimulate demand for landline subscriptions with slogans like 'the telephone, fly the heart-to-heart line', 'a bridge between us',[41] and more.

The advertising campaigns demonstrate the inherent ambiguity surrounding the new numbering plan as both a technical necessity and a leverage effect. In 1970,[42] there was a discussion about conducting a study on a new numbering plan to accommodate saturation in dense areas. A commission was created in 1972 to draft a new plan. From 1974 to 1981, areas with low population density were grouped together to free up area codes to be used for denser areas. This was a temporary fix; numbers were already missing. In a television interview the day after the event, the French Minister of Postal and Telecommunications Services (PTT) Louis Mexandeau stated, 'It was not to annoy the users. It was a necessity; we couldn't issue new numbers'.[43] Nevertheless, this created additional demand for telephones. The massive demand for telephone numbers, as other big network infrastructure, might thus be understood as a massive strategy of 'generating the very forms of demand to which investments and infrastructures are allegedly a response'.[44] During the same decade and coinciding with the end of incremental changes, the DGT, after 'intense controversy',[45] decided to distribute Minitel terminals on a 'free and voluntary basis'.[46] This decision gave it 'an aura of democracy'. It also aimed at creating a leverage effect – that is, it sought to achieve an increase in the number of users so that the development of services would become profitable and promote the existence of a new market.

From 1972 to 1976, studies concentrated on the possibility of a mineralogical plan that would conform with French departmental divisions, postal area codes, vehicle registration and more. However, this perspective, which was supported by several DGT directors, did not take into account the organisation of the existing network, population densities across the territory or international standards.[47] Others who advocated for the eight-digit plan emphasised the importance of segregating the telephone network from other networks. Only such a separation could, in their view, enable the expansion of telecommunications. The new numbering plan was a technical necessity and an

important tool for generating demand. In the next section, we argue that this constitutive ambiguity built a unified telephone network.

All of France working towards a unified telephone network

The preparation was twofold; it included a massive effort by all telecom technicians and a meticulous communication plan. On the technical side, if urgent warnings multiplied about the potential crisis, it stayed within the telecom administration. One long-standing technical issue facing telephones is that when a user's call fails to connect or is abruptly interrupted, they immediately attempt to call again. In the event of network problems, these repeated attempts can, in the worst-case scenario, overload a network, causing minor interruptions to escalate into larger ones. There was thus no risk of infrastructure collapse. Unlike later episodes, such as the Y2K bug,[48] the risk was that massive congestion would lead to massive disapproval. The threat of disapproval reveals, in retrospect, that there was a goal to create a precedent of industrial success. In a television interview, Denis Fraysse, delegate for the new numbering plan of the DGT, mentioned that the new numbering plan in France 'will enhance our prestige and presence abroad'.[49]

The potential industrial success of the new numbering plan was a strategy for bringing French telecommunications to the attention of the international community. As a form of infrastructural inversion, telecom infrastructure was thus made visible, highlighting the work of telecom technicians. These pictures, for example, depict technicians testing the changes to switching equipment. These pictures were taken prior to the overnight update on purpose: 'Just to prepare their switch for the new numbering, Jean, Jean-Paul, Joseph and Gérard will have worked for a total of three and a half months by October'.[50]

The budget for the new numbering system was 4.8 billion francs, of which 1.5 billion francs was used to adapt electromechanical switching equipment, 2.8 billion francs were used to change outdated and worn down switching equipment and 1.5 billion was used to adapt the electronic switching equipment. The various budget allocations depended on the switching material because each type of machine had to be modified differently. In the case of electromechanical switches, manual intervention in the translating components was directly necessary. Next to the old wiring, the wiring of the new numbering had to be installed in parallel for all the switches so that any potential problem could be easily identified (see Figure 2). Cabling was standardised. Technical notices were prepared.[51]

In electromechanical switching, equipment, telecom technicians « closed » half numbering parts (on the left of the picture) and change the position of the « riders ». At 11pm, it will be enough to « unplug »

Figure 2. Technicians updating switching equipment. Source: Direction Générale des Télécommunications, "La France à 8 chiffres," Revue Messages, October 1985, accessed July 1, 2023, https://drive.google.com/open?id=1P8sdhz6wpqL ENxiVZqDfiZg7JuyT-16l.

The DGT wrote, 'For electronic exchanges, however, it will be enough to send a simple code, and the computers will take care of the modification by themselves'.[52] New switching software could be installed parallel to the existing one. Letters from operational telecoms were sent to all local exchanges, requiring the renewal of switching equipment. As one television journalist stated, 'In all, the PTT had to modify nearly 5,000 exchanges, the majority of which were lost in the countryside'.[53] It was, therefore, necessary 'to identify the materials involved, inform the manufacturers who produced them, write the specifications, define the modification schedule with the stakeholders and manufacturers, monitor the implementation, and, finally, provide means to verify the adaptation'.[54] More than 2 million lines were replaced. At a national scale, 25,000 workers, from executives to technical staff, had to participate in preparations. Moreover, 600,000 private installations had to be adapted, involving nearly 30,000 manual operations, all of which had to be completed before 25 October 1985. Technicians also had to intervene on this night for 20,400 professional and compatible installations (including telephone cabins around highways and equipment for companies). However, the technical teams had slightly more favourable delays to carry out these interventions, with their work continuing into Friday evening and Saturday because the installations did not need to be performed

simultaneously, as with public switchers. The control services checked the modifications; it was necessary to follow the behaviour of all the switching equipment all across France.

As the photograph above depicts, it was not only ordinary maintenance that was rendered visible but also, and more importantly, the nationwide participation. The work of telecom technicians was heralded as exemplifying national coordination efforts and, more broadly, the success of the telecom industry. Telephone use grew very quickly from 4 million to 12 million subscribers, and the DGT could not manage the network as before. From their perspective, empirical management methods were no longer sufficient. In the first decades of French telephone networks, there was no system for the evaluation of the networks.[55] Instead, this task was primarily the responsibility of operators. Their work was the object of measurement and control, with the ultimate goal of increasing efficiency. However, the value of the network itself remained out of sight.[56] As Mireille Nouvion points out in her discussion of telephone network automation, 'With the automation of long-distance telephone service, the notion of network becomes more important'.[57] The more the network expanded, the more centralised it became, and a need emerged for tools and systematic means of control for governing telephone centre activity. During the preparation, the signalling systems surrounding each call were standardised.[58] Changing the numbering plan was part of a larger effort of formalisation and homogenisation.

Within electronic switching, the functions that are diffused across several electromechanical organs are separated, and simple functions are performed by specific parts functioning at high speed. Therefore, the system is able to deal with a large number of communications. Advancements in switching technology facilitated a rapid expansion in the number of telephone lines and contributed to the development of a more unified network while also reducing its dependence on geographically and spatially located machines. However, years before, several massive and important strikes by technicians within France Telecom occurred.[59] In the 1970s, these transformations began to be felt by the technicians, and they regarded them as an attempt to deprive them of the control they had over their tools and work.

In 1971, the DGT published a document titled 'General Instructions on the Maintenance and Servicing of Telecommunications Equipment'.[60] This document began being applied in 1973, and it aimed to both codify general methods and certify technician knowledge, especially for those technicians who had been recently hired due to rapid network expansion and had not yet received training.

Telecommunication technicians worried about losing their autonomy because before, 'within the narrow realm of connecting calls, they enjoyed a certain autonomy'.[61] They feared the fragmentation of tasks, specialisation and extensive de-skilling, or 'what, in a word, they call robotisation'.[62] In the early 1980s, several strikes for better working conditions occurred across France. In 1984, one syndicate 'demanded that all overtime work carried out under the new numbering plan be doubly compensated via the allocation of two rest days for all telecommunications personnel'.[63] In a history of those strikes, telecom technicians affirmed that the strikes of the 1970s – and not administrative inertia – postponed the breakup of the postal services and telecommunications.[64]

During the first years of preparation, there were several studies that caused concern. The French public did not know anything about telephone numbering plans; even the concept itself was largely unknown. No specific language relating to numbering plans existed. A telephone user acted according to their own habits while using their own personal technical equipment. Users had gotten used to the existing numbering plan even though it did not coincide with geographic or administrative partitions. Changing the system was not perceived as a priority, and for many customers, the costs (e.g., calling costs) and difficulty associated with subscriptions to new phone lines represented more important matters. In response, a specific time frame was to accompany the rhythm of the technical adaptations until the event. The postal service was also mobilised, and a massive mailing campaign was undertaken (see Figure 3). Mail communications were personalised so that each subscriber received their number with a personal reminder:

Careful consideration was given to the timing surrounding the discussion of the numbering plan in national newspapers. It was deemed important not to address the topic too early, as it could result in limited press coverage consisting of short articles months before the actual change. Different audiences were targeted according to different timelines. Every sentence and word was tested and validated 'down to the last detail'.[65] For instance, the campaign instructed telecom workers not to use the term 'Parisian people' but rather to say, 'If you have to make a call from Paris'.[66]

State educational institutions also launched campaigns targeting teachers and school children to familiarise them with the new numbering plan. October 25 fell during a vacation period, and therefore, commercials were broadcast on Friday night to ensure that they would reach a wide audience outside of working hours. The weekend was also available to rectify any mistakes. The late-night timeslot of 11 p.m. was deliberately selected as an off-peak period. Weekend telephone usage was much lower than it is currently. Television was considered the most cost-effective medium for

Figure 3. A memory Aid for telephone numbering. Source: Direction Générale des Télécommunications et Opus Hintzy, "Aide-mémoire," Orange-Direction Archivage Numérique et Patrimonial, Alfortville.

reaching a large audience, and it was considered reliable. The broadcasting of commercials was strategically planned to coincide with the 'D-Day', highlighting the significance of the event and emphasising its positive aspects.

An overnight shift at 11 p.m.

This section is dedicated to the moment of the changeover. The clock was ticking, and everyone was under pressure as the moment approached. Everything and everyone had to be ready. Television news broadcasts showed cables and technicians, making the telephone infrastructure visible (see Figure 4). It had to make the event possible or fail to do so. We focus here on the staging that surrounded the event across several media formats. To reflect on the journey of adopting the new numbering system, we focus on the technical preparation meant to test and control the transformation, the telephone as a friendly new media, and television and the event itself, which was soon to be followed by other steps in the development of telephone networks. Consider the words of one television journalist made before the new numbering system was implemented:

> Today is Friday the 25th of October. In a few minutes, the biggest operation that has ever happened anywhere in the world is going to start. At 1,700 different sites, 25,000 telecom agents will be at their posts tonight to make an eight-digit France at 11 p.m.[67]

The objective, as mentioned, was to avoid a complete shutdown and to keep errors to a minimum. A general rehearsal took place in the Murat Center in the presence of the journalists who covered French telecoms' 'D-Day' (see Figure 6). The plan unfolded with great precision, with everything planned to the exact minute. A supervisory network was established and 'linked together via the Transpac network',[68] the first data packets computing network in France. The entire system had to continuously report the changes in real-time to the Murat Center, which had to centralise the entire process. This again shows the role played by centralisation and computing tools in controlling the network.

Prior to the event, the older television media was enrolled in the advent of a new one. For the benefit of communication, two contrasting figures were carefully chosen: Léon Zitrone and a little girl named Caroline:[69]

Figure 4. Television coverage for the new numbering. Source: "Téléphone à huit chiffres," Television report, 1:45, from a journal televised by Antenne 2 on October 25, 1985, accessed July 4, 2023, https://www.ina.fr/ina-eclaire-actu/video/cab85107411/telephone-a-8-chiffres.

> Léon Zitrone appeared as an official figure, shaving a certain image of France. The little girl indicated to people that the forthcoming system could be easily adopted because a child could do it; it also showed that people had the impression of being able to quickly understand and learn the new numbering system.[70]

The duo was featured in a television advertisement about the new numbering system. In the advertisement, Léon Zitrone 'will talk to the nation' from the top of a giant blue telephone (see Figure 5).[71] It was part of the challenge:

> When Léon Zitrone discovered that he had to climb a telephone almost five meters high, he almost gave up! He was prone to vertigo, and a vertigo that was all the more terrible because the ground was floating on a carpet of dry ice, which did not allow any anchor point to fix his eyes. So he had to take it upon himself to overcome his fear, at the expense of the natural assurance that usually characterises him! This testimony reflects the atmosphere that reigned on the set during the entire shooting.

The filming of the commercial was described afterwards as somewhat of an adventure.[72] The television advertisement is a reminder that, in the 1980s, television was the most important media format. The telephone network depended on an old media format for communication; however, it also relied on press and radio coverage. Each media format was mediating and participating in the constitution of a telephone user ethic, envisioned as existing ones, updating to remain the same.[73] Every national television channel aired programs meant to prepare audiences for the overnight changeover. For one news program, Léon Zitrone and Caroline were interviewed by journalist Bernard Rapp:
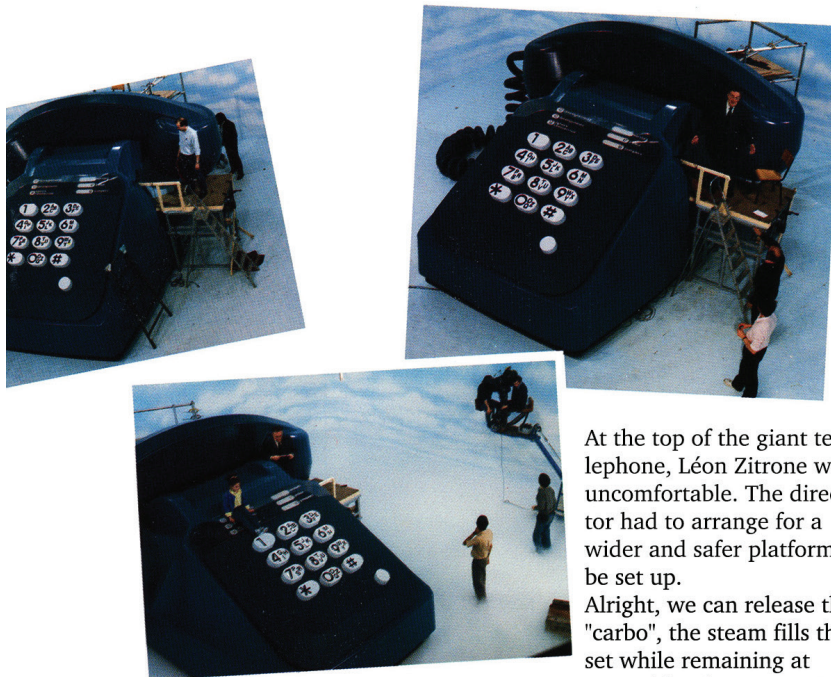
> Léon Zitrone, you are our uncle telephone!
> …
> - We've seen you a lot in the commercials about the new numbering system.
> - Information spots, if I may say so.
> - So, we're going to make you work! You're going to explain to us in a few simple words how we should do it. We'll start with the simplest: What is the new procedure for Paris to a province?

At the top of the giant telephone, Léon Zitrone was uncomfortable. The director had to arrange for a wider and safer platform to be set up.
Alright, we can release the "carbo", the steam fills the set while remaining at ground level, representing the clouds.

Le tournage en photos

The little Caroline is right, it's an 8 digit-number.

Figure 5. The shooting of the television advertising clip. Source : Direction Générale des Télécommunications, "Les leçons de Léon Zitrone," Revue Messages, May 1985, accessed July 1, 2023, https://drive.google.com/file/d/1xg4_Hu7n9Is0_mXytgGXwiVvI8_2mTCi.

> \- Paris to a province…. I think that Paris to Paris is simpler; we do the eight numbers! For province to province, we do the eight numbers. Paris to province, we do 16 and then eight digits. For a province to Paris, we do 16, then 1, and then eight digits.
>
> \- Tell us that again very simply!
>
> …
>
> \- My dear Léon, it's brilliant!
>
> …
>
> \- We feel that this will have a strong impact on the lives of the French. I believe that the French are a very intelligent, very astute people and that they will not make many mistakes. But if I am well informed, at the Ministry of Post and Telecommunications, they believe that people will make errors 25% of the time…. And it is because they fear this 25% figure that they are starting on a Friday evening so that people can practice on their little dial during the weekend. By Monday, you'll know everything![74]

This quote captures some of the media atmosphere of that time. Léon Zitrone humorously embodies wisdom and habits, while Caroline represents the freshness of that which is new. French users are quoted as being 'very intelligent' – or at least responsive to information campaigns – and caught up in the national fever. The televised familiarity accompanied a public campaign led by the state about the telephone. This object then entered the private lives of all French people, and the entire event surrounding the new numbering system appears to have accompanied this trajectory, redefining the boundaries between public and private life. For its actors, the new numbering system is presented as containing a larger purpose than the infrastructure itself:

> As someone close to the Minister of PTT pointed out to Caroline on the evening of October 25, The new numbering system is 90% you. No one will dare to say otherwise. In 20 years, in 30 years, the technical progress will be forgotten, but the new numbering system will always be you, your image and your smile because these are the things that remain.[75]

An infrastructural event that enabled future changes

As mentioned in the introduction, the transition was a success. Most callers adapted easily to the change in phone numbers. In the hour that followed, on television and, even more so, in the press and

radio coverage the next day, opinions were unanimous less than 24 hours after every phone number in the nation had changed. One Parisien newspaper ran an article titled 'The new telephone is a piece of cake'. Most newspaper articles carried similar stories. The same day, the multiple electric projectors of the television crew caused a power outage at Murat Center. At 11:01 p.m., Leon Zitrone made the first phone call with the new system and mistakenly dialled the number of a stranger instead of little Caroline, causing some laughter in the audience.

The night of 25 October 1985, however, was planned only as an intermediate step. The subsequent steps focused on further transitioning the equipment to full electronic switching, and the telephone infrastructure gradually faded into the background. The extent of the consequences resulting from such a change can be better understood by observing the transformation of the numbering plan that followed in 1996. It had initially been planned for 1995 but was postponed to the following year. On the night of 18 October 1996, at 11:00 p.m., the transition to a 10-digit numbering system was scheduled to take place. However, unlike in 1985, this change was more of a routine operation. The transition involved adding two digits to the beginning of all numbers (an area code) to expand French phone numbers from eight to ten digits. The numbering plan would no longer distinguish between Paris and the provinces, instead dividing France into five regions, each with its own code: 01, 02, 03, 04, 05. For mobile phones, which had been absent in 1985 but now had a growing number of users by 1996, the plan was to add '06' at the beginning of the eight-digit number. The specific code for routing numbers in the Paris region disappeared, as did the code for routing calls from Paris to the provinces. The code '19' was replaced by '00' to align with harmonisation requirements.

Nonetheless, the changeover still required significant preparation. France Telecom conducted over 100,000 tests on five separate occasions, and thousands of technicians were prepared to intervene should any issue arise on the designated day. Precisely at 11 p.m., the network's 1,325 exchanges seamlessly transitioned the numbers of 32 million subscribers, this time through fully automated processes. By 1992, out of the 30 million subscriber lines at that time, 90% of subscribers were connected to electronic exchanges, and nearly half of telephone circuits utilised standardised switching signalling. Prior to the 1996 switchover, all electromechanical switches had been replaced, as per a decision made 20 years earlier. As a result, for one year following the implementation of the new numbering plan, an automated voice message informed callers of dialling errors, making number changes less critical. In 1985, the telecommunications monopoly enabled the DGT to
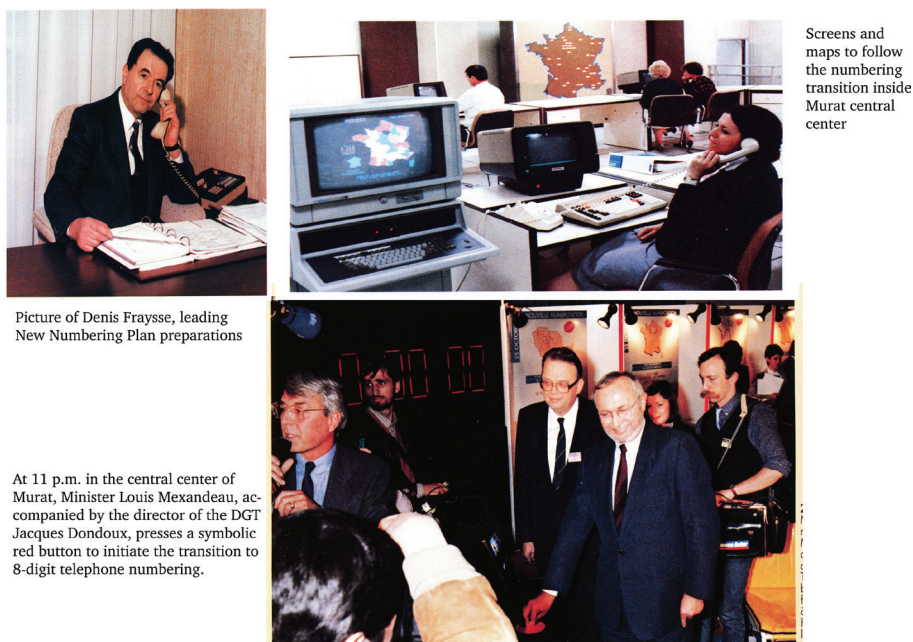
Screens and maps to follow the numbering transition inside Murat central center

Picture of Denis Fraysse, leading New Numbering Plan preparations

At 11 p.m. in the central center of Murat, Minister Louis Mexandeau, accompanied by the director of the DGT Jacques Dondoux, presses a symbolic red button to initiate the transition to 8-digit telephone numbering.

Figure 6. D-day for new telephone numbering. Source: Direction Générale des Télécommunications, "Nouvelle numérotation, la réussite d'une première," Revue Messages, November 1985, accessed July 1, 2023, https://drive. google.com/open?id=1P8sdhz6wpqLENxiVZqDfiZg7JuyT-16l.

mandate the production of switches with software specifically designed for the new numbering. By 1991, France Telecom had become an independent public entity. In 1995, the DGT, now no longer overseeing the work of installers, allowed companies to solicit various providers when upgrading their equipment.

Conclusions and future research

This article discussed an important infrastructural event that occurred during the 1980s when telephones became omnipresent in France. In line with existing research on telecommunications in France, we emphasised the break introduced by the political and industrial initiatives related to telecommunications.[76] The introduction of a new telephone numbering plan was part of an international race to expand telephone networks and services.

In light of the multiple innovations surrounding Minitel (considered to be the precursor to platforms[77]), the numbering plan has been relatively neglected in studies on the sociology of innovation and the history of telecommunications.[78] In this article, we discussed the evolution of the

numbering plan, providing an extensive review of its first decade of existence, which culminated in a massive infrastructure upgrade involving telecommunications technicians and the entire French population. Furthermore, this study of the introduction of a new numbering system in France revealed deeper transformations in the evolution of telecommunications during the 1980s. The preparation and implementation of the numbering plan led to decisive changes in the technical management of networks and the digitisation of telephony, including both terminal devices and the network itself.

The repeated declaration of a 'great delay' had discursive and political effects. It framed the discourse around the telephone, causing a double obfuscation. The omnipresent theme of delay may have diminished the role of infrastructural events, such as the new numbering system. This perspective may have also overlooked the interventions and investments of important actors in the design and deployment of the new and expanded numbering system. In terms of both hardware and communication, the long-term preparation for the new telephone numbering system was marked by many uncertainties that are related to the risk of project failure. However, these uncertainties also call into question whether there was sufficient demand for the telephone, even though this demand was at the same time actively produced.

Although our research cannot clarify this ambiguity regarding the numbering plan, by studying efforts to enrol customers in the numbering plan, we have illuminated several of the dimensions essential to the implementation of the industrialisation of telephone networks in France in the 1980s. First, on the technical level, the changeover to the new numbering system led to a transformation in the work of technicians. The automation of switching equipment was used as a lever by the French telecommunications administration to introduce new methods of management, as well as the centralisation and control of telephone networks. This process was partly opposed by telecommunications technicians. However, it was also their labour that facilitated the changeover to the new numbering system and achieved its unquestionable success.

In this respect, the involvement of technicians in the implementation of the new system resembles the communication operation with the general public. In both cases, the aim was to motivate people to participate so that the new instructions would be more easily adopted and followed. This also indicates that the introduction of the telephone into the private lives of French users was accompanied by the state acting as a guardian figure, embodied in part by Léon Zitrone and little Caroline. Further research should be conducted to determine whether the technocratic character

of this operation is a common feature or whether it is a socio-historical specificity of the investment in the telephone in the French context.

It is also necessary to discuss how the trajectory of the new numbering system sheds light on the relationships between users and machines and man and technology.[79] After the implementation of the new numbering system, the evolving use cases and users took part in transfers of agency between users, their telephone and the network, creating opportunities for new markets while switching faded into the background. In the 1990s, telephone networks began to support multiple services, and they slowly became a base for intermediation between service providers and users as clients. In a recursive loop, this technocratic event, which established telephone networks, played a role in building the individual and sovereign user[80] that is known today within contemporary mobile networks.

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Biography

Adrien Tournier is a Ph.D. student in Science and Technology Studies at CNAM's HT2S (History of Techno-Science) laboratory in Paris. Mobilising infrastructure studies, his thesis centers on constructing a historical genealogy of 5G, the fifth generation of mobile telecommunications network infrastructure. His research delves into the history of telecommunications in France and explores how the decoupling of virtual machines from their physical hardware gives rise to sociotechnical infrastructuring processes.