

Trains, planes and computers

From high-speed trains to computerised reservation at French Railways

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The introduction of the Socrate computer reservation system (CRS) in 1993 on French railways was highly controversial. This was partly because of problems in its implementation and the ensuing confusion among passengers and partly because of its origins in an American airline computer system. This article is based on research by the author and explores the reasons for this technical choice and its implications. The controversial launch of the computer system in 1993 at the Société Nationale des Chemins de Fer Français (SNCF) is first reviewed, before looking at the US origins of the system. The experience of the deregulated US airline industry in using computers for competitive advantage in the 1970s and 1980s, which SNCF was hoping to emulate, is examined next. Transferring air transport expertise also relates to the development of the TGV, which is then considered. Pricing differentiation was first introduced in French rail transport through the TGV, and Socrate can be seen as an extension of this commercial objective. It is argued that the TGV innovation, intended to prevent rail transport decline, also made SNCF seek solutions such as CRS, developed in the airline industry, which became questionable in a national rail transport business.

Fieldwork at SNCF for this case study was conducted in 1994–95 after the problematic introduction of Socrate.¹ SNCF introduced Socrate (Système Offrant à la Clientèle des Réservations d’Affaires et de Tourisme en Europe), a computerised reservation system, in April 1993. SNCF bought Sabre from American Airlines in 1989 in order to build Socrate. One of its aims was to transform its commercial activities through a technological investment, importing techniques used in the airline industry. However, Socrate provoked nationwide strikes when it was introduced and attracted considerable negative media coverage. For such an ambitious project, and perhaps because of it, there were a number of problems in its design, development and implementation.

SNCF started the Socrate project in 1989. One of its aims was to reposition French railways in the competitive European environment and win more traffic. Socrate would support the diversification of pricing, ticketing and reservation services. A policy that would maximise revenue was also important, since SNCF had been a semi-public as opposed to a nationalised utility since 1982. One of SNCF’s most important objectives was to instigate a new

marketing philosophy based on yield management techniques.² To do this SNCF bought Sabre (initially Saber, Semi-Automatic Business Environment Research), the American Airlines computerised reservation system, a classic example of a computer system which had provided competitive advantage to one of the largest and most successful airlines. Several years were spent adapting this software developed by a private airline to the context of the rail industry and of a national semi-public-sector institution.

When it was first implemented, however, both SNCF staff and their customers rejected Socrate and its underlying ticketing, pricing and selling philosophy. The teething difficulties were widely reported in the French press,³ and were also investigated by SNCF itself.⁴ They drew the attention of trade unions,⁵ business consultants,⁶ passengers' associations⁷ and the government, which commissioned a public inquiry into the system.⁸ Technical malfunctions, political pressure, poor management, unco-operative unions and passenger resistance combined to cause a chaotic launch. The project management team neglected databases and input sets. Staff training was inadequate and did not prepare sales clerks for tariff inconsistencies which they had to deal with. The user computer screen interface was designed using airline logic, which was difficult for staff and customers to understand. The new ticket format was too complex and difficult for passengers to understand. Public relations failed to prepare the public for the change. Database problems on timetable and routes, inaccurate tariff information and unavailability of ticket exchange facilities caused problems for the SNCF sales force and customers. Incorrect fares and train connections led to large queues of customers in main-line stations and to a major public outcry. Online reservations available through the Minitel public network failed, tickets were booked for non-existent trains while other trains ran empty, the railway trade unions went on strike and passengers' associations sued SNCF.

The system contributed to complex changes in French Rail, which had stayed relatively unchanged regarding the services on offer and passenger practices. The new ticketing and pricing policies introduced through Socrate radically changed railway users' and rail workers' practices, which were grounded in important cultural dimensions of French society. Socrate began to indicate a new phase of forced global innovation in an enterprise facing strategic imperatives and organisational changes. The competitive environment became that of European integration, which opened the area of transport to deregulatory moves and to the growth of competition across transport modes, to which the TGV had already contributed.

The origins of Socrate

The reasons advanced for upgrading the previous computerised reservation system were the need to increase yields per seat and control distribution channels. Additionally, SNCF seems to have been obsessed with air transport, which played a part in the choice of software. The rhetoric of IT-led competitive advantage and the well documented story of Sabre's strategic

success at American Airlines were very influential in the business world of the 1980s.⁹

Until the early 1980s sales clerks used various sources to complete transactions, and rail passengers often had to go to several offices to obtain information, a reservation and finally a ticket. Only in the late 1980s did workstations in railway terminals, travel centres and telephone services began to be linked to central reservation systems. This allowed bookings to be made at the same time as tickets were printed by an all-purpose ticket machine. The workstation usually has access to a computer-aided timetable enquiry system, which suggests the best route and times. British Rail, for instance, integrated the systems into one set between 1991 and 1993 for InterCity services. Some of the objectives were to reduce transaction times and encourage reservations. Whereas British Rail built on its own systems, SNCF chose to abandon its in-house system and bought Sabre in 1989 from American Airlines for FF 1 billion (£100 million). Jean-Marie Metzler, head of inter-city passenger services and a graduate of the Ecole polytechnique, with a long record of top positions within SNCF, including director of the first TGV programme in 1981, proposed the purchase to the SNCF board on 22 March 1989.

The previous computer booking system, RESA (Réservations et Suppléments Associés), was developed in-house and implemented in the 1970s to meet a growing demand for reservation management. It was argued in 1989 that a new system was needed to handle a predicted 135 million reservations a year by 1995, with the opening of the Channel tunnel in 1994 and TGV Paris–Lille in 1993. However, a later report to the government investigating the Socrate implementation problems states that the existing RESA system would have been capable of absorbing future increases in reservations.¹⁰ SNCF seems to also have had an additional strategic agenda, which included competing with airlines, the ambition to host other rail companies' data and control distribution channels, like CRS in the air industry. Since 1987 SNCF had been planning to renovate its distribution mechanisms. The Passenger Marketing division carried out strategic studies to examine the nature of European passenger rail supply, pricing and distribution.¹¹ These studies concluded that SNCF had an advantage with its high-speed network but that the environment would become more and more competitive. Socrate would enable SNCF to compete on sales and distribution. A confidential SNCF document states that: competition would increase between rail and other transport modes, particularly air; the opening of the European market would lead to increased competition between air operators, and that more than 50 per cent of SNCF passenger rail services on medium and long routes would compete with air.¹² A primary objective was to improve supply, but more important, 'to be able to adjust supply in the short term using the "weapon" of pricing'.

A new distribution policy entailed a reduction in distribution costs through: the use of Minitel and vending machines in stations; control of travel distribution channels; product penetration through these networks, in France, Europe and elsewhere; and, crucially, pricing flexibility. A clearly

defined tactic was to establish links between the SNCF computer network and global travel distribution systems. RESA was seen as obsolete, but not so much in its processing capacity: ‘the functionalities of RESA do not support the marketing and distribution policies envisaged’.¹³ These included the forecasting and optimisation of overbooking and tariff quotas. SNCF therefore chose to purchase such software from the airline industry. Arguably, building its own system would have taken SNCF seven years. Yet there was a clear ambition to be the first to set up an electronic rail distribution network in Europe.¹⁴ And the distribution, optimisation and short-term adjustment of fare prices were paramount in the software selection.

In their search for a technical partner, SNCF considered US and German national railways – Amtrak and Deutsche Bahn – but also airlines – Swissair and British Airways – as well as other airline CRS such as System One, Apollo, Galileo, Amadeus. American Airlines’ Sabre was chosen because it had a strong emphasis on distribution and optimisation and excellent yield management. It was also technically compatible and could host services from other rail companies. This sophisticated computerised reservation system could help SNCF fill its trains, in the same way that American Airlines filled its planes, and make SNCF as effective as airline companies. In the words of two main initiators of the project:

Rail must reach the level of its competitors, particularly airlines. The answer to this challenge is information systems, in the form of modern reservation systems . . . International sales must be facilitated through global distribution systems such as the ones found in airlines.¹⁵

Sabre and American Airlines’ competitive advantage

The use of computers in airlines has expanded over the last thirty years to include most functions. Airlines spend heavily on information technology, an average of \$0.5 billion per year in the 1990s.¹⁶ The most heavily automated functions are reservations and maintenance/engineering. Companies such as United Airlines also sell applications and automation services to other carriers, and the most extensive offerings are those of American Airlines.

The origin of Sabre goes back to Sage (Semi-Automatic Ground Environment), a real-time radar defence network to guard against surprise Soviet air and missile attacks funded by the US Air Force in 1951. American Airlines (AA) and IBM, which had been involved in Sage, started the first commercial real-time system, Saber, in October 1959. Its development took over 400 man-years and cost \$30 million. The initial version was capable of handling information from and about other air carriers, and AA was able to charge rent for the use of its system. This first mover’s advantage lasted several years, until Eastern Airlines launched PARS (Programmed Airlines Reservations System 1) in 1965, also known as System One, which performed a number of functions in addition to reservations (e.g. check-in, fare quote, weight and balance). By 1972 TWA had its own version of PARS and United Airlines had set

up a system called Apollo. Schulz refers to these developments as the first-generation CRS (1958–74) which concentrated on system building and competence acquisition, with airlines becoming customers of the CRS vendor airlines.¹⁷ The technical lead held by AA and then Eastern was no longer so obvious by the mid-1970s.¹⁸ All the main carriers had stable and reliable internal systems and communication networks supporting their main operations.

The second-generation CRS (1975–85) focused on marketing and niche innovations. With the deregulation of US airlines in 1978, American Airlines introduced ‘name check-in’, which linked passenger names and marketing records, thus enabling the introduction of the first ‘frequent flyer’ programme.¹⁹ Another innovation was the realisation of the importance of the travel agent market, which had provided 30 per cent of bookings in 1967, compared with three times that number in 1987.²⁰ The introduction of terminals in travel agencies had started slowly, but deregulation provided a competitive spur in the late 1970s. American Airlines started aggressively pursuing travel agents as ‘lease’ customers and installing Sabre terminals. Agents had access to the flights of all airlines that paid AA a fee for entry on to Sabre. By the end of 1985 American and United had 45 per cent and 29 per cent of the CRS market respectively,²¹ and by 1987 95 per cent of travel agents were automated.²² Additionally, AA realised the market potential of Sabre and devised the ‘co-host’ scheme whereby smaller carriers can pay to have preferential displays on agents’ terminals, i.e. for their flights to appear on the screen before those of competitors. This gave rise to numerous carriers and travel agents filing petitions with the Civil Aviation Board because of problems associated with CRS dominance. Vendors were not prevented from making charges, which continues to make CRS ownership a financial gold mine, since 98 per cent of US travel agencies do their bookings on one of the four dominant CRS (Sabre, Apollo, Worldspan and System One). Control and domination of distribution channels through computerised reservations have contributed to the concentration of airline operators, first in the United States, then in Europe and the rest of the world (through global alliances, code sharing and the use of an American CRS for all companies in an alliance). Schulz suggests a third generation of CRS (1986–90s) characterised by smart workstations, which allowed Delta Airlines, for instance, to enter the corporate travel market. The corporate segment in particular makes use of complex databases to manage corporate clients’ travel expenses. In the mass travel market there is consolidation into nationwide ‘mega’ agencies. Additionally, PCs and internet-based services allow passengers to book direct from home, and this may reshape the travel agent industry further.

Perhaps most important for SNCF, ‘conservative estimates credit Sabre with a cumulative cash contribution to American Airlines between 1976 and 1986 of \$900 million, producing an internal rate of return during the decade of 68.7 per cent’.²³ In 1991, with 85,000 terminals in travel agencies in forty-seven countries providing access to fares and schedules for 665 airlines, Sabre accounted for about 85 per cent of American Airlines’ earnings.²⁴ In 1997 Sabre was in place in fifty-four countries and 20,000 travel agents, with estimates

suggesting that some 130,000 terminals were connected to the system. Each day some 1.6 billion bookings were taken over it for some 740 airlines.²⁵

Sabre has been cited since the mid-1970s as an example of the use of information systems to gain competitive advantage. According to Max Hopper, vice-president for Information Systems at American Airlines, who joined AA as director of Sabre in 1972, 'we helped define an era'.²⁶ However, he argues that it is difficult to document the claim that Sabre generated substantial increases in traffic by creating market-power advantages. He states that 'Sabre's real importance to AA was that it prevented an erosion of market share'. He believes that most explanations of Sabre's success focus on the competitive advantage realised by locating terminals in travel agencies and are superficial. The cumulative complementary and incremental technical and organisational capabilities are a better explanation. Factors such as well established operating routines and a long-standing pattern of tit-for-tat rivalry between American and United Airlines, even prior to deregulation, accounted for many necessary competitive counteractions. American Airlines did not plan to dominate distribution channels but learned by doing. Further, Copeland stated in 1991 that: 'it is most unlikely that another organisation will replicate the strategic *coup* that American accomplished with Sabre' and that 'today no company would allow a competitor to gain electronic control over a distribution channel, in large part because of the example of the airlines' experience'.²⁷

CRS have also been profitable through fees from other airline companies for hosting their data, and SNCF was hoping to similarly charge fees to other rail companies. The intention was for Socrate to be in a good position in the European market, thereby changing the role of SNCF towards that of an international rail distribution provider: 'to be the European leader in terrestrial high-speed passenger transport'.²⁸ SNCF top executives took on board the strategic rhetoric of the 1980s, believing an organisational mutation was needed and that Socrate was a means to achieve it.²⁹ They perceived the future core business as rail distribution and Socrate as the tool of a commercial and international enterprise competing with airlines. Their reasoning was based partly on the fact that 50 per cent of SNCF revenue comes from ten major routes where there is fierce competition with air. They saw it as an 'absolute duty' to equip the enterprise with CRS technology, seen as an 'intellectual instrument with predictive power'.³⁰ In the logic of global markets and increasing competition, computers are seen as a technological response to commercial (capacity management) and financial (profit maximisation) problems in the service sector generally. Increased competition in service industries such as hotels, cruises, car hire and amusement parks has fuelled the development of ever more sophisticated computer modelling systems.³¹ However, whether American Airlines' experience over many years could be transplanted and duplicated in a different context is another question.

According to Hanlon, 'proponents of market contestability consider the airline industry as almost a textbook example of a contestable market'.³² A feature of third-generation CRS is yield management. 'Within the context of

a deregulated environment, yield management, in combination with PC-based reservation systems, as well as the established large-scale systems, provides the airlines with unprecedented ability to provide customer service and “marketplace” pricing.³³ Yield management techniques enable optimal filling of planes, combined with as great a profit as possible for each seat filled, through optimising the average price/rate of occupation ratio per seat. There is a constantly changing quota (proportion of seats at different prices) on each plane according to monitored demand, so that, from the customer’s perspective, pricing varies according to the time of booking, the type and time of aircraft. Yield management, combined with electronic control over distribution channels, resulted in a strategic *coup* for American Airlines.³⁴ The European transport context of the 1990s proved to be quite different from the US air context of the 1980s, particularly as regards passenger pricing. The transferability of the US air transport deregulation model to European transport can be questioned more broadly, too. There are differences that present obstacles to the transfer of US air deregulation to European rail transport.³⁵ Institutional and social reasons preclude the full adoption of US-style deregulation. There are different understandings of industrial policy, State intervention and notions of public service across countries. Some of these economic, social and cultural reasons have been addressed elsewhere in relation to this case.³⁶ Here we want to concentrate on SNCF pricing tactics to establish a link between advanced differential pricing techniques and high-speed trains. The historical success of the TGV effected a transformation of rail transport that explains the choice of airline computer systems, as well as the troubles Socrate encountered.

Pricing and yield management

The new commercial techniques used by Socrate to manage passenger travel can be traced back to pricing techniques first used on TGV trains in the early 1980s. More sophisticated differentiated pricing became possible with Socrate and its yield management techniques. They imply that passengers will modify their buying habits to bring higher profits, particularly from the TGV network; and they still maintain cheap fares (at certain times) to fulfil SNCF’s public service mission. This emerges as a perfect political compromise for SNCF. But yield management is also ‘a pricing strategy developed since deregulation so that established airlines can at least appear to be competitive in price with the new entrants and might even be able to fill otherwise empty seats with stimulated demand’.³⁷ Large US air companies used it to protect themselves from intramodal competition with other companies and still appear competitive. It would seem that SNCF also saw the importance of appearing to be competitive, but in a situation of internal competition between its own trains, the TGVs and the ‘classical’ inter-city trains, on similar routes.³⁸

As a public monopoly SNCF has historically been caught between the notion of public service and budget constraints. Traditionally, the aims of managing urban and rural development and maintaining a national identity

formed the basis of cross-subsidisation in French rail transport. Accordingly, to travel a kilometre cost the same price all over the country, which was seen as fair and equal to all French citizens, and the price of a ticket was calculated on the basis of the distance travelled, by whichever train or line, and whatever the costs. Profits realised on some lines could be used to subsidise losses on others. This principle resulted from a dual constraint imposed on SNCF: that of operating unprofitable lines and that of balancing its budget on an overall national basis, rather than per market. For many years train fares were calculated according to the distance travelled, following this geographical cross-subsidisation. Public utilities, including major air companies, apply the principle in order to provide services in the interest of national and regional development.³⁹

SNCF introduced a few changes in the late 1970s.⁴⁰ The aim was to optimise average revenues by withdrawing fare reductions (mainly socially motivated discounts, e.g. family cards, youth passes, old-age pensioners) at peak times so that price-sensitive passengers travelled on underutilised trains at different times. It was based on a tricolour calendar with three time zones, red for very busy, blue for busy, white for quiet periods, published every year and widely available (like Channel ferry or holiday cottage brochures). It was based on previous results, accumulated mainly through sales figures and counting passengers and types of tickets on trains. This dealt primarily with trains in heavy demand (holidays, weekends). In the red zone on Friday and Sunday evenings no fare reductions were available. In the blue zone on bank holiday weekends or school holidays, only some reduced fares were allowed; and in the white zone all reduced fares were accepted. Special discounts only available in 'white' periods were also devised. This pricing system was clear and easy to publicise. Pricing was still according to the number of kilometres travelled, which was understood by passengers, who could work out the cost of a specific journey. With the tricolour calendar, passengers could also establish very quickly when they could use their reduction entitlements. This price differentiation, if simple, was also heavy. The calendar had to be set a long time ahead and it had some absurd effects. However, the cost of increasing price differentiation, which involves the use of sophisticated computer systems, was initially seen by SNCF as too high to warrant any change.⁴¹ Elaborate price differentiation would be a major consideration in the choice of the Sabre software.

SNCF started experimenting with further price differentiation on the first TGV line, Paris–Lyon, that opened in 1981, and then Paris–Ouest in the early 1990s.⁴² A major change was the use of compulsory and chargeable reservation and the introduction of different types of 'supplements' for very busy trains (TGVs as well as conventional inter-city trains). The objective was not only to fill empty trains but also to increase profits on busy routes and compete with air, which proved successful on the Paris–Lyon route. Prices varied from a factor of 1 (for the slower conventional train to the same destinations) to 1.35 on the TGV. When the TGV to Le Mans was opened in the early 1990s the increase in the second-class fare was between 25.4 per cent and 53.5

per cent (according to the period in the calendar) over 'normal' prices, i.e. calculated on the basis of kilometres.⁴³ One implication of this system (which was superimposed on the tricolour calendar system) was that it was cheaper to travel first-class on certain trains than second-class on others. The principle of cross-subsidisation was being eroded in the sense that price became related to the type of train and the time and day of travel rather than distance. TGV technology and differential pricing became successfully associated.

Socrate was launched to coincide with the opening of the new Paris–Lille TGV in April 1993. Sophisticated pricing mechanisms were implemented on the TGVs, although pricing differentiation was less extreme on the rest of the network.⁴⁴ The well publicised opening of the new Paris–Lille TGV, and the parallel introduction of Socrate, with its modifications of commercial principles through yield management, affected passengers negatively. Sophisticated price differentiation threatened the principles of geographical and social cross-subsidy and equal access to transport. More parameters could now be used to modulate pricing: not only the type of train and a more refined division of the time of travel (the day of the week but also the exact time of the day), but also the type of purchase, and the flexibility (or lack of it) of the bought product.⁴⁵ Like marketing, yield management seeks to redefine and segment demand and concentrates on the price/quality relationship. Yield management includes both pricing and inventory control. In the air industry seat inventory control enables the airline to influence yields and total revenues in real time, on a flight-by-flight basis, within a given price structure.

Reservation now affects the price. Seat numbers ('quota') are blocked according to fare groups, and the prices also vary according to the date of purchase (e.g. from two months ahead to forty-five days – or from forty-four to fifteen days – before the time of departure). Some constraints are introduced, such as staying a Saturday night. The prices vary (the earlier one books, the cheaper it is) to constantly experiment with the size of quotas, until departure. The system limits capacity for discounted fares in order to smooth demand peaks and to fill the lows. The means of doing this are quota management and overbooking. According to demand so far, if the risk of rejects (too much demand and dissatisfied customers) is greater than the risk of waste (unoccupied seats, therefore loss of earnings), priority is given to the high fares group. Conversely, if the risk of waste is higher than the risk of rejects, the priority is given to the low fares group. Compulsory booking enables the gathering of information to constantly adjust the quotas online.

Passenger associations objected to these new pricing and booking principles.⁴⁶ For example, they argued that: when pricing was modified on the first TGVs in 1981, prices were 20 per cent higher than the kilometric unit applied to the conventional inter-city trains (reservation costs and supplements were additional to this); in 1993 this overpricing was, for example, 51 per cent higher on full fares and 102 per cent on reduced fares for Paris–Le Creusot, 57 per cent and 130 per cent for Paris–Le Mans, 84 per cent and 141 per cent on Paris–Lille. These difficulties, and the problems associated with the new ticket, led to dissatisfaction and anger in a clientele

which had been historically faithful to rail transport because of convenience and simplicity as well as price.⁴⁷ Passengers compared the new system with the previous one, where prices were clear, with only a few supplements on 'luxury' or busy trains, and where travellers could organise their trips easily and flexibly without booking ahead and improvise if necessary.⁴⁸

Yield and quota management, when compared with the previous pricing differentiation, where several techniques were simply used in conjunction, is a fundamental shift. Detailed information is gathered about each train seat throughout every day, week and year. This goes far beyond dividing prices into crude time periods: information is gathered continuously on seats sold so far, enabling the modification of the price mix on each train in real time; each train journey becomes identifiable and marketable as an individual and isolated product or market segment. This puts into question geographical and national cross-subsidisation and socially oriented price structures. The emphasis on market segments coincides with the development of the most profitable part of the network, the TGV lines. Yield management maximises the proportion of TGV high fares and is seen as imposing slower trains upon less wealthy passengers. The development of the TGV is also perceived as contributing to the *désertification* of less populated areas, as TGV lines are more profitable with fewer stops: 'we do not stop everywhere.'⁴⁹ Yield management can also lead to maintaining an offer at a slightly lower level than demand, to maximise revenue per seat.

Passenger associations officially complained that the new Socrate commercial techniques did not fulfil public service requirements under French transport law. Following the controversies about overpricing (above the standard franc/kilometre baseline), a compromise was reached in an amendment to legislation in July 1994 after negotiations between SNCF and passenger associations.⁵⁰ It limits maximum prices (to 40 per cent above baseline prices) and the proportion of overpriced trains. Nevertheless, passenger representatives thought that this was a poor compromise in that the amendment in effect legitimated the end of geographical and social cross-subsidisation and abolished the link between price and distance. On the other hand, a senior SNCF yield management expert said that it was 'too small a step in the right direction'; some SNCF interviewees stated that 'passenger associations were not representative'; they used detailed technical counter-examples during interviews to demonstrate that passenger associations were wrong or did not understand the system; or stated that 'no system is perfect' and that it was easy to find the 'odd exception to the rule to prove the system wrong'.⁵¹

Passenger representatives also opposed the extension of yield and quota management to the whole SNCF network. Retrospectively, it seems to have been a serious misjudgement, particularly in the case of regional transport. (The system was never applied to urban/suburban transport.) It certainly contributed to the negative perception of Socrate: names of small destinations were not included in the database system, which concentrated on profitable segments, leading to manual input and long queues; incomprehensible tickets and prices are not acceptable for relatively short journeys.⁵² More generally,

though, the boundaries between long-distance, high-speed long-distance, national, regional, regular and occasional travelling market segments are fuzzy, as is illustrated by the case of Lille–Paris TGV users, who were some of the most vocal in their opposition to the new pricing and compulsory reservation.⁵³ Lille is only one hour away from Paris by TGV, and this radically changed travelling habits. The use of the TGV as a commuter train presented unanticipated difficulties and blurs the boundaries between transport market segments.

From the TGV to Socrate

There are clear links between the TGV trains and the Socrate system through pricing, and between the computer system and airlines through competitive advantage. The political and institutional dimensions of the TGV rail innovation, and its relation to airlines, precede and thus explain further the Socrate events. The TGV innovation was a way for SNCF to deal with new economic challenges in the context of growing withdrawal from the State.⁵⁴ It was the result of SNCF looking to innovate to stop what was perceived as the terminal decline of rail transport. This was a political problem, as SNCF had continual budget deficits; and it was an economic problem for constructors, as market demand for rail equipment was diminishing. TGV technology legitimated the existence of railway engineers and constructors. The perception of the decline of rail came partly from the United States, where road transport was winning over rail transport. At the same time the Airbus was being designed in the aerospace industry, and its potential effect was thought to modify air/rail/road competition. However, and unlike the air industry, the history of innovation in rail originates primarily from the rail enterprises rather than the manufacturers (e.g. Aérospatiale).

SNCF is subject to political, financial and administrative control from the State to ensure the ‘public good’. The notion of public service in French Railways can be summarised as ‘no barrier to access for each and every one, speed and safety’. But at the core of the public enterprise lies a tension. Its financial structure is designed to ensure solidarity (and this affects fare structures), whilst it clashes with profit objectives. Up to the 1970s, when the TGV project was beginning to take shape, the notion of public service was strong and shared across actors even with different interests (workers, engineers, executives, civil servants). There was pride in belonging to the enterprise and belief in the spirit of innovation for the public good, even if it served various groups unequally. The search for speed came to represent this. Aeronautical engineering influenced the search, and there were various projects in the late 1960s such as turbo-trains and aero-trains that drew on jet engines. There was also international competition with the US and Japanese high-speed trains. Engineers easily imposed their faith in the success of speed. This coincided with executives’ aims of catching up with the United States and Japan and of presenting SNCF as a dominant and profitable company. The representation of the project thus evolved and arguments which convinced and

enrolled politicians were issues of regional development, a 'new' rail system (not just faster trains but new lines) and policy, decentralisation and equality symbolised in the slogan 'Speed for everyone'. TGV technology became a means to achieve business objectives and bring competitiveness as well as address political aims.

The TGV project was technically successful because it effected a major shift: instead of running faster trains on existing lines, new lines were built, separate from normal inter-city trains but kept compatible when using the urban network to reach central city stations. By changing the nature of the network, it became possible to address the technical issues of speed. Perceiving speed as the most rational and modern way to deliver a transport mode was coupled with a democratic purpose: 'Democracy through speed'.⁵⁵ The French TGV represented an adaptation of rail transport which saved rail from decline, 'like motorways for road transport'.⁵⁶ Investments were funded through SNCF self-financing, State contribution and borrowing guaranteed by the State,⁵⁷ revealing faith in the TGV potential to achieve commercial success: 'in the same way as Columbus and his ships redrew the map of the world, the TGV produces Europe'.⁵⁸ Other elements which had a positive influence on the project were the choice of line for the first TGV (Paris–Lyon) and the fact that, after the 1973 oil crisis, electricity became the dominant form of energy: the main rail network was largely electrified, and the aerodynamic TGV was represented as energy-saving and more cost-effective than road or air.

Once in existence, the TGV created a transformation in use, increases in traffic and profitability, and more competition with planes. It became an important new transport mode which expanded into Europe, and TGV technology was sold abroad. But it was not sufficient to stop the crisis at SNCF. Traffic was still being lost, attitudes to opening new TGV routes changed, and passengers were complaining about reservations and prices. (Their experience with TGV reservations and pricing in the 1980s may have influenced their reactions to Socrate in the 1990s.) The tensions between public service and profit making were still present in the mid-1980s, and some of the initial aims and rhetoric surrounding the Socrate project were very similar to those surrounding the TGV project. For instance, addressing business objectives and public mission at the same time, through the use of yield management to simultaneously bring higher profits and maintain a public service; using technology to solve political and economic problems; faith in technical progress represented in the 1980s by computers (as opposed to aircraft in the early 1970s). A link between high-speed trains and computers was made in 1989 by the Conference of European Transport Ministers as representing modernisation and progress.⁵⁹ The TGV was seen as successful, so an effort was made to extend it through Socrate. The TGV innovation influenced attitudes into seeking similar solutions, but it became a factor as it had itself changed the scene. TGV technology had an important effect on transport planning and pricing: dedicated lines allow high speed but require rigid train formations of fixed capacity, like aeroplanes, so it is impossible to add a

coach or two to meet variations in demand.⁶⁰ This leads to capacity management issues, which affect yield management. Indeed, the price of speed is loss of flexibility.

The TGV increased competition with air, and TGVs are a kind of cross between planes and trains. This led SNCF to look for air travel-related solutions and to aim at becoming an organiser and distributor of transport through advanced use of CRS. However, the model encapsulated in Sabre contributed to intramodal (between TGVs and conventional high-speed trains) as well as intermodal (between air and rail) competition. This deregulation model has implications for transport planning through the separate accountability of identifiable and marketable segments made possible by CRS and yield management.

There is ongoing public debate on European transport liberalisation and deregulation.⁶¹ The French transport situation is still changing and the Socrate project has had serious effects too. In an effort to rebuild its image, SNCF carried out an audit and set up consultative committees with passengers.⁶² It reversed its differential pricing policy, reviewed fares and ticketing in early 1994 and simplified its tariff.⁶³ The 1993 Moissonnier audit report to the Transport Ministry had in fact recommended that commercial optimisation should be applied only to the TGV and should be suspended from the rest of the network (though only in the short term). SNCF made it easier to catch a TGV without booking; reinstated and improved ticket refunds and cancellations of group tickets; introduced an 'access ticket' in case of very long queues at ticket offices; decreased prices on reduced fares; reintroduced free exchanges of tickets and reservation changes without penalty; provided better information on prices breakdown (reservation, supplement); allowed some 'open' tickets; increased quotas for reduced fares on some TGVs.⁶⁴ SNCF claims that these measures regained traffic lost through the initial problems with Socrate by 1994.⁶⁵ This policy has been continued in subsequent years⁶⁶ – by allowing passengers to change their choice of TGV up to the last minute,⁶⁷ by allowing reduced fares on all TGVs,⁶⁸ by simplifying the number of reduced fare categories⁶⁹ and by introducing new types of tickets.⁷⁰ Pricing simplification and decreases were credited with a 3.5 per cent increase in long-distance traffic in 1999, better than 1998 predictions, and a 4.3 per cent increase in revenue.⁷¹

Many viewpoints exist on the nature and direction of European rail transport.⁷² Recent developments in French rail have been: the separation of infrastructure and operation; opposition to the construction of new TGV lines considered; investment instead in 'classical' inter-city lines; interchangability of inter-city and high-speed trains using TGV rolling stock more flexibly and on non-dedicated tracks; the simplification of pricing differentials; and the limited use of yield management. Thus SNCF is becoming more of a multimodal combined public transport concern. The use of new tools such as CRS, yield management and new pricing tactics did not lead to direct adoption but rather to the adaptation of these management models to a specific national context. Whether high-speed trains can replace airline services

between European cities is a question that remains open, together with the implications it will have for public, regional and national railway networks.

Appendix

List of interviewees, Paris, 1994–95

Below are listed the organisations and departments whose employees were interviewed, followed by the position, at the time I spoke to them, of those interviewed, with a note of their previous role in the Socrate project if they had moved on. More than one job title appears when several people were interviewed together in the same department or organisation. Interviewees' names do not appear for reasons of confidentiality.

SNCF, Service grandes lignes, Relations internationales, Paris: Directeur, previously Directeur Voyageurs grandes lignes et Directeur projet Socrate
SNCF, French Railways Ltd, London: Computer Department Manager; Marketing Manager

SNCF, Service grandes lignes, Département communication, Paris: Délégué aux missions extérieures; Déléguée adjointe

SNCF, Service grandes lignes, Maîtrise d'ouvrage Socrate, Paris: Gestionnaire de projet

SNCF, Service grandes lignes, Service de veille technologique, Paris: Documentaliste; Chercheur

SNCF, Direction des services communs à la clientèle voyageurs, Pôle Service et distribution, Paris: Manager de la formation, previously Responsable des relations humaines du projet Socrate

SNCF, Service grandes lignes, Département marketing, Paris: Manager

SNCF, Direction de l'informatique, Maîtrise d'oeuvre informatique voyageurs, Paris: Gestionnaire de projet, previously Responsable informatique du projet Socrate

SNCF, Direction de l'informatique, Pôle Recherche opérationnelle, Paris: Responsable informatique, previously Optimisation commerciale, projet Socrate

SNCF, Service grandes lignes, Direction du personnel, Paris: Liaisons syndicales

SNCF, Gare Paris Montparnasse, Service ventes: Vendeur guichet (agent commercial); Vendeuse guichet; Inspecteur trains (agent commercial train)

SNCF, Service grandes lignes, Direction du contrôle de gestion, Paris: Manager audit de gestion, previously Responsable des ventes grandes lignes et membre de l'équipe Socrate

SNCF, Service grandes lignes, Comité central d'entreprise, Paris: Coordinateur Club Méditerranée, Direction de l'informatique et des télécommunications, Paris: Directeur informatique, previously SNCF, Responsable des ventes grandes lignes et membre de l'équipe Socrate

Confédération générale du travail, Syndicat des cheminots de Paris Montparnasse: Secrétaire général; Secrétaire adjoint; membre

Confédération française démocratique du travail, Branche cheminots, Syndicat des cheminots et travailleurs des activités ferroviaires de Paris ouest rive Gauche: Secrétaire général adjoint

Fédération nationale des usagers du transport, Paris: Secrétaire générale;
 Secrétaire adjoint
 Nouvelles frontières, Unité d'enseignement du tourisme, Paris: Chargée de
 formation; Responsable d'agence

Notes

- 1 Research access was relatively easy and the timing was judicious: access immediately after the events (summer 1993) would certainly have been refused, as SNCF was greatly exposed to media scrutiny for several months and a climate of blame prevailed. In fact, interviewees appeared to welcome an opportunity to re-examine events six months later, and most interviews lasted three or four hours. I was also given liberal access to internal files and documentation covering the initiation and development of the Socrate project, starting from 1989. Several of the original members of the Socrate executive team were interviewed, as well as SNCF senior managers, yield management experts, marketing, human relations and training managers, SNCF sales staff, railway union representatives, passengers' associations, CRS experts and travel agents. For a list of interviews see the appendix.
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- 4 Jacques Berducou, 'La Politique commerciale grandes lignes', press conference held by Jacques Berducou, Directeur de l'Activité grandes lignes, SNCF grandes lignes, Paris, 6 January 1994; Jacques Berducou, 'Action programme wins back lost traffic', *Railway Gazette International*, October 1994, pp. 645–8; Direction de la Communication SNCF, 'Conseil d'administration SNCF du 26 mai 1993', *Temps Réel* 61 (26 May 1993); 'Les Résultats du trafic grandes lignes au premier semestre 1993', SNCF Grandes Lignes (GLYI), Paris, 1993; 'Le suivi de Socrate, les TGV Nord Europe, les prix, l'accès au train, la réservation, les échanges, les automates', *Socrate cartes sur table*, No. 2, Paris, 13 July 1993.
- 5 CGT, *Socrate : la SNCF recule*, Secteur fédéral des cheminots CGT de Paris Montparnasse, Paris, 27 September 1993; CGT, CFDT, FO, CGC and FMC directions centrales, *SNCF : filialisation danger. Plateforme syndicale commune des cheminots européens*, Confédération générale du travail, Confédération française des travailleurs, Confédération française des travailleurs cadres, Confédération générale des cadres, Fédération des maîtres cadres, Paris, 1994; FO, *Défendre le service public, défendre le statut*, Fédération syndicaliste force ouvrière des cheminots, Paris, 23 November 1994.
- 6 Causa rerum, *Evaluation des effets de la médiatisation de Socrate auprès de la clientèle*, Étude réalisée par Causa Rerum, sous la responsabilité de Marie Cabanès, Pôles études clientèles et services, Département marketing, Direction grandes lignes, SNCF, Paris, 17 February 1993.
- 7 FNAUT, *La SNCF est et doit rester un service public*, Jean Sivardière, président, Fédération nationale des Associations des usagers des transports, Paris, 1993; FNAUT, 'TGV : le prix du train', *FNAUT Infos* 19 (January 1994); FNAUT, 'SNCF : vers la déréglementation tar-

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 - 10 Moissonnier, *Rapport au Ministre de l'équipement, des transports et du tourisme*, p. 2.
 - 11 Interview, *chercheur*, Service de veille technologique.
 - 12 SNCF, 'Note pour le Conseil d'administration : rénovation de la distribution SNCF, le projet Socrate', confidential, 12 January 1989, SNCF, Paris.
 - 13 SNCF, 'Note pour le Conseil d'administration', p. 5.
 - 14 'Vendre des réservations à tous les Européens? Le rêve de la SNCF', *Médias*, March 1992.
 - 15 Jean-Marie Metzler and Andrée Lemaître, 'Vers un système de distribution ferroviaire international avec Resarail 2000', *Revue générale des chemins de fer* 109 (December 1990), 21–4, 21.
 - 16 Henderson, 'More cash for computers', p. 82.
 - 17 Schulz, 'The emergence of real-time computer reservation systems', p. 66.
 - 18 Adam, 'A licence to steal?', p. 78.
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 - 21 Schulz, 'The emergence of real-time computer reservation systems', p. 68.
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 - 23 Copeland, 'So you want to build the next Sabre system?', p. 58.
 - 24 Copeland, 'So you want to build the next Sabre system?', p. 59.
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- 47 Moissonnier, *Rapport au Ministre de l'équipement, des transports et du tourisme*, p. 13.
- 48 Sivardière, 'Socrate l'empoisonneur', p. 1.
- 49 Attributed to Jean-Marie Metzler, Directeur, Commercial Voyageurs, and head of the Socrate project. It has been argued that the large distances between TGV stations are 'desertifying' the smaller towns and regions in between.
- 50 Article 14 is a piece of legislation that specifies pricing principles for SNCF. It is part of the *Loi d'orientation des transports intérieurs* (LOTI), a law first formulated on 30 December 1982 (Decrees 82-1153, 83-109, 83-817) which determined SNCF status, responsibilities and constraints, see 'Cahier des charges de la SNCF', *Journal officiel*, 21 July 1994; article 18 states that SNCF as a public enterprise 'aims to run, manage and develop the national rail network according to public service principles'; it has been criticised for not clarifying those principles. (See Cuq and Bussereau, *Une nouvelle donne pour la SNCF*, p. 18, who also criticised the SNCF *contrat de plan* 1990-94 for being vague and not mentioning issues of regional development and territory management.)
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- 63 Berducou, 'La Politique commerciale grandes lignes', press conference.
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