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Federal administration in the lead-up to the computer

Nick Schwery

Abstract

This paper examines the context in which the first computers, yet to be ordered in fall 1960, were interpreted by the Swiss federal administration. The focus of investigation is the moment when, by means of an inconspicuous note to the Swiss Federal Council, responsibility for upgrading the federal administration's Statistical Office to computers shifted from the Statistical Office to the Central Office for Organizational Affairs. This paper will further show how the Central Office was able to define the computer not as a better tool for statistics (in line with punched card machines), but rather as a general-purpose machine available to the entire federal administration. Henceforth, computer projects would inevitably involve a series of trade-offs: between general availability and individual use, between management hierarchies and project organization, between the needs of the computer and the needs of the entire federal administration, and between a range of actors who had to find ways to cooperate.

Introduction

This article aims to describe the initial interactions between computers and the Swiss federal administration.[1] In so doing, it will argue against the commonly held idea that technology enters public administration ready to be used – as a solution to a specific problem, for example, growth – and precipitates change. Were that the case, the administration would have to adapt to the new technology.[2] I will show, on the contrary, how negotiations regard-

1 I would like to thank the reviewers and editors for their valuable input. All quotations in this article have been translated by the author.

2 For example, Arre Zuurmond, From Bureaucracy to Infocracy: Administrative Reform by Technological Innovation in the Netherlands, Baden-Baden 1997; Rüdiger Bergien, «Big Data» als Vision. Computereinführung und Organisationswandel in BKA und Staatssicherheit (1967–1989), in: Zeithistorische Forschungen/Studies in Contemporary History, 2017, 14(2): 258–285; or Guido Koller, Sebastian Schüpbach, Geschichte der

ing the use and integration of computers in the Swiss federal administration took place before the first computer system was ever ordered. As Atshushi Akera has shown for the United States, the computer had to be interpreted as a tool for administration.[3] Rules, procedures, and regulations all had to be defined, a computerized administration imagined, and infrastructure organized even while computers were still in the offing. This early history of computerization shows how the federal administration negotiated early computer projects and how it planned to digitize processes and procedures between bureaucratic, programming, and project forms in the near future.[4]

In Switzerland, the prospect of a computerized administration began to emerge in October 1958, when 51-year-old Roger Bonvin, a member of both the Swiss National Council and the Christian Democratic People's Party, submitted a *kleine Anfrage*, or written question, to the Federal Council. Bonvin was an ambitious politician from the canton of Valais. His question expressed dissatisfaction. In his view, the Federal Statistical Office did not «meet the requirements of today's life» – neither organizationally nor with

modernen Verwaltung, 2016: http://www.livingbooksabouthistory.ch/de/book/the-history-of-modern-administration (8/12/2020): «The growth of the federal administration meant that more and more information had to be processed in ever shorter time. With this background, technological change began to have a lasting impact on the federal administration» (p. 5).

3 Atshushi Akera, Engineers or Managers? The Systems Analysis of Electronic Data Processing in the Federal Bureaucracy, in: Agatha C. Hughes, Thomas Parke Hughes (eds.), Systems, Experts, and Computers: The Systems Approach in Management and Engineering, World War II and After, Cambridge 2000, pp. 191–220. Akera points out that before the computer came into the administration, it first had to be interpreted as an administrative tool. In America, this was done by the National Bureau of Standards in the person of Samuel Alexander. Akera identifies areas of tension between technicians and management: «[A]ny analysis of data processing operations could become an implicit critique of the existing bureaucracy» (p. 202). See also Nick Schwery, Die Maschine regieren. Computer und eidgenössische Bundesverwaltung, 1958–1965, in: Preprints zur Kulturgeschichte der Technik, 2018 (29).

4 The issue is not only about how the computer came into the federal administration; it is also about how the federal administration in turn migrated into the computer and how computer projects were carried out. See David Gugerli, Wie die Welt in den Computer kam. Zur Entstehung digitaler Wirklichkeit, Frankfurt am Main 2018.

respect to the pace of work.[5] He took aim at four specific areas: first, the inadequate «internal structure» and cooperation with other departments within the federal administration; second, the lack of «rationalization of the administration's working methods»; third, the lack of «electronic mechanization of work processes»; and fourth, the non-existent adaptation to «the new needs».[6] Bonvin's critique was formulated in abstract terms, but his meaning was clear: the Federal Statistical Office needed to modernize.[7] Bonvin had trained in engineering at the Federal Institute of Technology Zurich (ETH Zurich), and had been involved in constructing the first Dixence dam (1932–34) and the Mauvoisin dam (1949–55). He entered politics at the age of 41 as a «conservative-Christian-Socialist local councilor of Sion». His hope was that modernizing the statistical office through electronic mechanization would also make it more efficient.[8] To do that, the structures of the office would have to change. Bonvin must have been quite determined on that point, because in his request, he followed up his critique by asking the Federal Council whether they «did not consider it necessary to draw up a reorganization plan».[9] For Bonvin, modernizing the administration was unthinkable without such a plan.

5 Swiss Federal Archives (BAR) E3320B#1976/141#1*, Kleine Anfrage Bonvin, 1/10/1958.

6 Ibid.

7 Eduard, head of the Institute of Applied Mathematics at ETH Zurich, was also involved in the Mauvoisin dam. At his institute he calculated the deformation under water pressure of the dam under construction. See Walter Gautschi, Schweizer Expats in den USA, 2016: https://ethz.ch/content/dam/ethz/special-interest/infk/department/Images%20and%20Content/Spotlights/Gautschi_Walter_Expats.pdf (16/7/2020). Stiefel, Switzerland's computer pioneer, put Konrad Zuse's Z4 calculating machine into operation at ETH in 1950 and, with the collaboration of Ambros Speiser and Heinz Rutishauser, built the Ermeth computer – «the first Swiss computer» – which he operated until 1963. See Hans Neukom, Early Use of Computers in Swiss Banks, in: Annals of the History of Computing, IEEE, 2004, 26(3): 50–59; Evelyn Boesch Trüeb, Eduard Stiefel, in: Historisches Lexikon der Schweiz (HLS), 2010, https://hls-dhs-dss.ch/de/articles/031672/2010-11-29/ (16/7/2020).

8 Georges Andrey, Roger Bonvin, in: Historisches Lexikon der Schweiz (HLS), 2009, https://hls-dhs-dss.ch/de/articles/004723/2009-12-10/ (29/4/2020).

9 BAR, Kleine Anfrage Bonvin.

Four short years later, the Statistical Office put into operation the Swiss federal administration's first computer system. It was based in a computer center (*Rechenzentrum*) set up especially for the new computers under the umbrella of the Statistical Office, which had to cooperate with other departments. Achieving the technological «state of the art» fulfilled the promise of modernization. Bonvin's four criticisms had been addressed, and Bonvin himself had a seat in the Federal Council. But it wasn't only the Statistical Office that had changed.

Renewing the equipment

In the meantime, the Statistical Office had already begun to think about renewing their equipment for the 1960 census. Bonvin's *kleine Anfrage* aside, the administration, and with it the Statistical Office, had a perpetual improvement problem: under constantly changing circumstances, «the willingness and ability to reform and to make other adjustments is still among the core characteristics of a good administration».[10] If the administration wanted to be a good administration and the Statistical Office a good office within this administration, it constantly had to adapt. But reform was never straightforward, and the office was forced to fall back on allies. As a result, proposals and reports regarding «renewal of equipment» typically included Bonvin's request as the starting point, which lent a note of legitimacy to the Statistical Office's efforts.[11] Equipment renewals had been subject to review at regular intervals of ten years for each new census since the 1920s.[12] But for

10 Wolfgang Seibel, Verwaltung verstehen. Eine theoriegeschichtliche Einführung, Berlin 2017, p. 102.

11 For example, in the final report with a proposal for upgrading the equipment: «On 1 October 1958, Bonvin submitted a ‹*kleine Anfrage*› concerning the reorganization of the Statistical Office, in which he asked, among other things, whether the ‹efficiency of the office might not be considerably increased by electronic mechanization of the work processes for faster evaluation of all material›». BAR E6502–02#2002/226#16*, Report on Renewal of the Equipment ESTA, 8.1960.

12 From 1850 to 2000, the census provided information on the population, households, buildings and dwellings in Switzerland every ten years. Since 2010, the Federal Statistical Office has conducted the census annually. In order to make the process easier for people,

the 1960 census, and for the first time, computers were being considered in addition to the punched card technology used for decades.[13] This is hardly surprising, given the radically widening scope for the use of computers at the end of the 1950s. Computers were no longer restricted to the military and to science but were also being used in business and administration.[14] As early as 1951, a UNIVAC computer from Remington Rand was in use by the US Census Bureau, and in 1957 the first computers found their way into German public administration to process the annual payroll tax adjustment.[15] Computer manufacturers boasted that their new machines could further rationalize mass data processing, which was often already being done with punched card systems. These mostly classical administrative tasks typically involved processing statistical data, preparing pay slips or stock inventories, executing accounting tasks and interest-rate calculations, and updating savings accounts.[16]

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much of the information is taken from the population registers of the communes and cantons, the federal registers of persons, and the federal register of buildings and dwellings. See Bundesamt für Statistik, Volkszählung, https://www.bfs.admin.ch/bfs/de/home/grundlagen/volkszaehlung.html (15/12/2020).

13 The name given to the new technology, which was negotiated in the federal administration, was anything but certain around 1960: from electronic data processing machine (EDPM) to EDP system to computer, electronic computer, digital or electronic computer system, or simply calculator. In the article, I stick consistently, somewhat ahistorically, to the term *computer*, which came to be used in distinction to the so-called conventional punched card machines, which computers slowly began to replace.

14 See computer history, e.g., Martin Campbell-Kelly et al., Computer: A History of the Information Machine, Boulder 2014; Gugerli, Wie die Welt; Michael Sean Mahoney, Histories of Computing, Cambridge MA 2011.

15 See Hans Peter Bull, Verwaltung durch Maschinen. Rechtsprobleme der Technisierung der Verwaltung, Köln 1964, p. 37; Robert Garner, Early Popular Computers, 1950–1970, 2015, https://ethw.org/Early_Popular_Computers,_1950_-_1970#Citation (29/4/2020) or Ricky Wichum, Verwaltungsrecht und Automation um 1960, in: Dennis-Kenji Kipker et al. (eds.): Der normative Druck des Faktischen: Technologische Herausforderungen des Rechts und seine Fundierung in sozialer Praxis, Stuttgart 2019, pp. 69–87.

16 See Josef Egger, «Ein Wunderwerk der Technik». Frühe Computernutzung in der Schweiz (1960–1980), Zurich 2014.

Bonvin's *kleine Anfrage* took advantage of this widening of the computer's scope of application. The Swiss federal administration, too, should benefit from the electronic mechanization of work processes. In the Statistical Office, the intended «renewal» was approached in the usual bureaucratic manner. Because the equipment review took place every ten years, the office was able to draw on a certain amount of experience and routine. IBM and Bull, both computer manufacturers that had business relations with the federal administration through punched card systems, offered their new IBM 7070 and Bull Gamma 60 systems. The Statistical Office examined the offers and ran through the census tasks with both manufacturers.[17] The office then attempted to calculate the economic efficiency of these computers compared with «conventional» punched card systems, assuming a lifetime of twelve years. According to the calculation, the massively higher purchase price of the computer should be compensated by savings on personnel. A solution using the cheaper of the two computers was expected to cost around 7 million Swiss francs[18] – about 3 million francs less than calculations based on punched card systems.

The Statistical Office decided on the IBM system, «not only because of the price, but also because it is a company whose conventional machines we have been using for 30 years, so we have a well-established relationship with them».[19] Bull also operated punched card systems in the federal administration, but not in the Statistical Office. The decision favoring IBM was more cost-effective and also promised continuity. The Statistical Office remained an IBM power user. Perhaps it was due to this well-established cooperation that little attention was paid to the transition from punched card systems to

17 «In 1958, International Business Machines Corp. (IBM), supplier of punched card machines to the Statistical Office, introduced to the market a sensationally innovative medium-sized EDP device known as the IBM 7070. Soon afterwards, BULL offered a similar device, the Gamma 60.» BAR E6502–02#2002/226#16*, Report on Renewal of Equipment, Statistical Office, 31/8/1960. An offer from computer manufacturer Remington Rand reached the federal administration too late.

18 How approximate this calculation was is obvious from the different stages of the report, which can be found in the archive. The figures in the table had to be corrected several times.

19 BAR, Report on Renewal.

computers. It was apparently assumed that the computers would be seamlessly integrated into the office's existing structures. The introduction of the new computer technology was calculated at an additional cost of only 90,000 Swiss francs. Thus, on 31 August 1960, the Statistical Office put in a request to the Federal Council that «the electronic data processing system IBM 7070 [coupled with an IBM 1401] be ordered immediately» and added: «Because of the delivery periods of 1–1 1/2 years, a decision should be made quickly».[20] By the end of 1961 at the latest, the computer system should be ready to process the punched cards resulting from the census and output the data as statistics.[21]

Negotiating computer use

But the Statistical Office had not expected the Department of Finance to intervene. Despite the continuity ensured by the decision to go with IBM and despite agreement that automation was needed in the federal administration to save money and personnel, the Statistical Office's request hit a roadblock. A handwritten note accompanying the report stated concisely: «For a transaction of such a costly scope, only a decision by the Federal Council is possible»[22] Federal Councilor Hans-Peter Tschudi, a Social Democrat and head of the Federal Department of Home Affairs (*Departement des Innern*), added a second note addressed to the Statistical Office, which was under his authori-

20 BAR, Report on Renewal.

21 The census was conducted in the following way: In 1960, census takers armed with forms went door to door throughout Switzerland. The completed forms were sorted at the Statistical Office, and the information was transferred to punched cards. The cards were then fed into the computer, which processed the information into statistics. According to a Swiss film newsreel from 1961: «Tons of completed census forms are now arriving at the Federal Statistical Office in Bern. Here is Switzerland, distilled on paper. [...] The sorting and extracting of information have only just begun. But in a year's time, the counters will have worked their way through the mountain of paper to prepare the forms for processing by huge electronic machines.» Schweizer Filmwochenschau, Ausgefüllte VZ-Formulare kommen ins BFS zurück, 1961, https://www.youtube.com/watch?v=eHwumxwUHT8 (9/7/2020).

22 BAR E6502–02#2002/226#16#*, Note, 2/9/1960.

ty: «Request for a motion to the Federal Council. Considering its importance, an expert opinion from the Central Office for Organizational Affairs should be attached.»[23] The requested upgrading of the equipment with computers required an expert opinion from the federal administration's Central Office for Organizational Affairs (*Zentralstelle für Organisationsfragen der Bundesverwaltung*). Tschudi was looking for support for the high investment costs and wanted to politically secure the plans of one of his offices. With this note to the Federal Council, the computer requested by the Statistical Office was directly linked to the organization of the federal administration. The future use of computers implied more than the rationalization, cost savings, and modernization of one office. From this point on, the computers in the administration were tied to the purpose of administrative reform.

The federal administration's Central Office for Organizational Affairs had been set up by the Federal Council in 1953 to slow down the politically controversial expansion of the welfare state after the Second World War.[24] The creation of the Central Office was initially an internal response to failed reform attempts using staff surveys and external experts after the war; a year later, the office would be a response to the «popular initiative for federal administrative control» (*Volksbegehren betreffend einer eidgenössischen Verwaltungskontrolle*).[25] Switzerland was experiencing strong population growth

23 Ibid.

24 In Switzerland, the 1950s represented one of two decades of growth in the postwar period. In the long 1950s, «economic growth, social prosperity and individual welfare [still] went hand in hand», as economic historian Jakob Tanner pointed out in 1994 in a comprehensive review (p. 39). According to Tanner, ambivalence toward growth, for example, the disappointment and frustration structurally inherent in economic expansion – the «paradox of plenty» – and the lack of or poorly trained or unskilled human capital only entered the «collective horizon of perception» during the 1960s (p. 38f.). The internal view of the federal administration in Switzerland complements Tanner's overview and shows that this ambivalence began to show itself earlier in the federal administration than in production. See Jakob Tanner, Die Schweiz in den 1950er Jahren. Prozesse, Brüche, Widersprüche, Ungleichzeitigkeiten, in: Jean-Daniel Blanc, Christine Luchsinger (eds.), Achtung: die 50er Jahre! Annäherungen an eine widersprüchliche Zeit, Zurich 2004.

25 See Koller, Schüpbach, Geschichte moderner Verwaltung and BAR E6500-02#1986/114#193*, Evaluation Sparexpertisen, without author or date. In response to the popular initiative, the department changed its name from «Coordination Office for Savings and

and increasing purchasing power, and the Swiss were committed to the «American way of life».[26] The problem of growth within the administration was to be coordinated by the Central Office. Its mandate was to «continuously examine the appropriateness and effectiveness of the organization and working methods of the federal administration as well as the possibility of making it more economical».[27] Administratively, the Central Office was subordinate to the Department of Finance and Customs. Technically, however, it was largely independent and directly responsible to the entire Federal Council, which also appointed its head.[28] Its first director was Otto Hongler (1907–1988), who earned his doctorate in economics and taught at the ETH Institute of Management (*Betriebswissenschaftliches Institut*). Before moving into public administration, Hongler had worked as an expert on organizational issues in trade and industry.[29] The Central Office for Organizational Affairs was a small office, in line with its mission. From an initial two civil servants, the Central Office grew to five by 1960. In its first few years of operation, the office mainly produced or commissioned expert reports. It also tried to obtain input to improve the organization of the federal administration in a decentralized manner with the help of *Organisationsmitarbeiter* (organizational assistants), who were appointed in the departments as links to

Rationalization Issues» (*Koordinationsstelle für Spar- und Rationalisierungsfragen*) to Central Office for Organizational Affairs of the Federal Administration. See BAR E6502–01#1993/126#246*, Report on Present-Day Efforts to Organize Work Expediently and Economically, Hongler, 1956.

26 Jakob Tanner, Zwischen «American Way of Life» und «Geistiger Landesverteidigung». Gesellschaftliche Widersprüche in der Schweiz der fünfziger Jahre, in: Unsere Kunstdenkmäler, 1992, 43(3): 351–363.

27 BAR E6502–01#1993/126#254*, Federal Act on the Central Office for Organizational Issues of the Federal Administration, 6/10/1954.

28 See Peter Olivet, Die Organisation der Organisation der öffentlichen Verwaltung in der Bundesrepublik Deutschland. Aufbau und Arbeitsweise der zentralen Organisationsstellen in der öffentlichen Verwaltung der Bundesrepublik Deutschland, Berlin 1978, p. 254 ff.

29 See Andrea Weibel, Otto Hongler, in: Historisches Lexikon der Schweiz (HLS), 2005, https://hls-dhs-dss.ch/de/articles/011524/2005-02-08/ (1/5/2020). Hongler remained director of the Central Office for Organizational Affairs until his retirement in 1973.

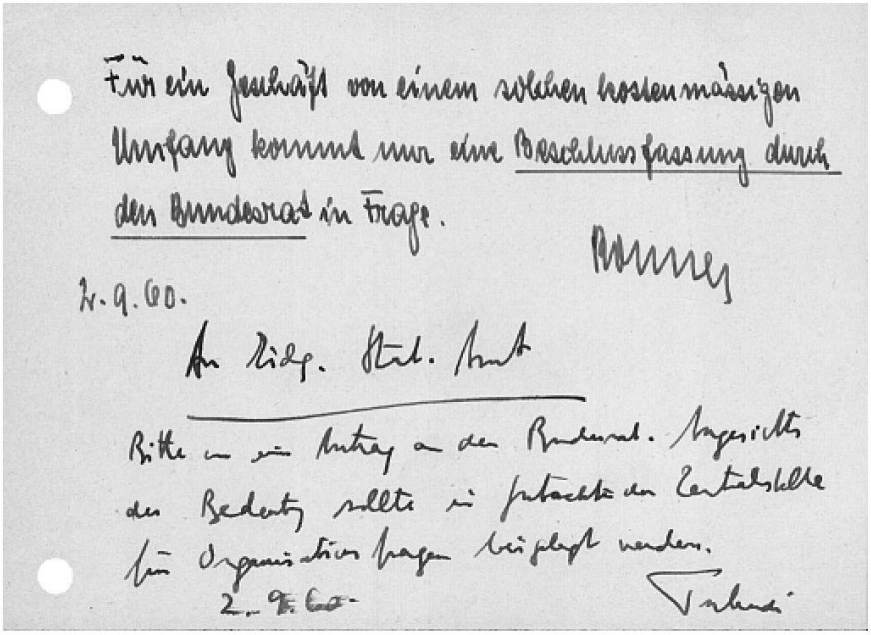

Fig. 1: Handwritten notes in the «Report on Renewal of the Equipment of the Statistical Office» (Swiss Federal Archives E6502–02#2002/226#16*). «A transaction of such costly dimensions requires the approval of the Federal Council. 2/9/60 [illegible signature] / To Federal Statistical Office / Request for a motion to the Federal Council. Considering its importance, an expert opinion from the Central Office for Organizational Affairs should be attached. 2/9/60. Tschudi» BAR, Note.

the Central Office. The organizational assistants reported progress and provided suggestions regarding rationalization of their respective departments to the Central Office on an annual basis. The review of the organization of the federal administration, its departments and offices, and its working methods was thus partly delegated to the departments and their offices and divisions. The Central Office saw itself as an economically savvy advisory center for rationalization and it nominated civil servants, rather than an administrative elite to initiate the changes. In nominating and working with the organizational assistants to initiate change, the Central Office was targeting as their change agents not an administrative elite, but civil servants.

According to Tschudi's note of fall 1960, whether and how the Statistical Office's equipment was to be renewed was suddenly no longer a matter for the Statistical Office. Rather, the matter was the responsibility of the Central Office for Organizational Affairs, which was charged with making a rec-

ommendation to the Federal Council in its «Report on Renewal of the Equipment of the Statistical Office».[30] The computer to be ordered had escaped the jurisdiction of the Statistical Office, which wanted to control and operate it. The transfer of the computer to the competence of the Central Office offered the latter a welcome field of action to fulfill its task. Only then could the computer become the solution to the problems that Bonvin had formulated in his request (internal structure, cooperation with other offices, rationalization, electronic mechanization, and adaptation to new needs). Both the purchase and the use of the computer became the subject of negotiations that went far beyond specific machines or the 1960 census. Thereafter, it was also a matter of organization, physical space, personnel, and coordination not only of the Statistical Office but also of the entire federal administration. The computer would serve as a resource for the administration to reconfigure itself under the guise of rationalization. There was no need even for a reorganization plan for the Statistical Office, as Bonvin had thought in 1958.[31]

Computer? Yes, but ...

The requested expert report triggered action within the Federal Administration. Otto Hongler personally took over responsibility for it. He quickly sent a catalogue of questions comprising eleven points to the Statistical Office, which had to provide answers and documents.[32] In addition, he consulted various departments within the federal administration and punched card and

30 BAR, Report on Renewal.

31 This was apparently the case wherever public administration and computers came into contact. In 1966, Niklas Luhmann wrote on the subject of the computer in public administration: «A refreshing thought-provoking impulse comes from the fortunate fact that the machines are so expensive. Their price forces one to rationalize the organization of data processing outside the actual system to an extent that would have been unfeasible without this impulse.» Niklas Luhmann, Recht und Automation in der öffentlichen Verwaltung. Eine verwaltungswissenschaftliche Untersuchung, Berlin 1966, p. 9.

32 BAR E6502-02#2002/226#16*, Request of the Central Office to the Statistical Office Renewal of Equipment, 15/9/1960.

computer companies. As a result of the investigation, he announced that «the acquisition of a powerful electronic data processing system (EDPM) [was] appropriate for the federal administration» – but only if adjustments were made.[33] The Central Office presented the computer to be ordered not as a tool for the 1960 census but as a flexibly applicable piece of administrative equipment – a general-purpose machine.[34] This reinterpretation necessitated adjustments to the configuration of the system, personnel, and access.[35]

The first adjustment to be made – configuring the computer system – was occasioned by the different demands placed on the computer. While the Statistical Office wanted a computer that could be used to calculate the 1960 census more quickly, the Central Office wanted an administrative machine that could be used more flexibly and whose field of application extended beyond statistics. For this reason, Hongler recommended supplementing the IBM system with additional components that were «necessary for carrying out work for other departments».[36] These additional components meant almost 800,000 Swiss francs in additional costs, bringing the purchase price of the system to 5.2 million Swiss francs. In addition, Hongler calculated other machine costs during the period of operation amounting to 2.5 million Swiss francs. In parallel, suitable premises had to be found for the computers, which required 240 square meters of space.[37] After a renewed economic efficiency calculation, which now considered «the total costs of the punched card or EDP service», the savings compared with the punched card operation amounted to 2.8 million Swiss francs.[38] The costs were thus minimally lower than in the calculation made by the Statistical Office. Despite higher machine costs, the economic efficiency remained assured.

33 BAR E6502-02#2002/226#16*, Expert Report Hongler, 2/11/1960.

34 Only at this point was structural equality between computer and administration a possibility, as described by John Agar, The Government Machine: A Revolutionary History of the Computer, Cambridge MA 2003.

35 BAR, Expert Report Hongler.

36 BAR, Expert Report Hongler.

37 The machine room of the Statistical Office was not suitable for this purpose because it was not high enough. See BAR E6502-02#2002/226#16*, IBM7070/1401, 26/9/1960 and BAR, Expert Report Hongler.

38 BAR, Expert Report Hongler.

Hongler identified a second critical adjustment in the transition of work processes from punched card systems to computers. The ongoing work at the Statistical Office had be transferred to the computer as quickly as possible, and not, as originally intended in the Statistical Office report, after the end of the census in 1965. Because the census would require «employment of a larger number of programmers» in the first three years, «the use of an EDP system [...] is largely a personnel problem.»[39] These yet unidentified personnel – the roles of the programmer and analyst were anything but clearly defined in 1960 – were supposed to transform the general-purpose computer into an administrative machine and specialize it. In his expert report Hongler therefore requested «that the selection of personnel be given the greatest attention». Without «competent people with a talent for these tasks», the computer could be used neither «properly» nor in a «cost-saving» manner.[40] The personnel problem posed by the question of programming and integrating technical staff into the administrative structures would accompany the computer in the administration for the next decades.[41]

The third adjustment appeared to have been more sensitive, to the extent that Hongler wanted to come back to it «in a later, separate report». The issue of «coordination between departments, responsibility for controlling the use of punched cards and EDPM», i. e., the question of access to computers, could possibly risk the consensus of the first report that the «computers were adequate».[42]

39 Ibid.

40 Ibid.

41 Programming the computer was a common problem for all employers at the time and was accompanied by the problem of general staff shortages and skills deficits. A closer look at the figure of the programmer exemplifies these issues. See David Gugerli, Der Programmierer, in: Alban Frei, Hannes Mangold (eds.), Das Personal der Postmoderne, Bielefeld 2015, pp. 17–32; Nathan Ensmenger, The Computer Boys Take Over: Computers, Programmers, and the Politics of Technical Expertise, Cambridge 2010, or JoAnne Yates, Structuring the Information Age: Life insurance and Technology in the Twentieth Century, Baltimore 2008.

42 BAR, Expert Report Hongler.

Centralized coordination

Up to this point, the Central Office had little trouble making its case. A few adjustments to the configuration here, some hints at possible difficulties there. It was clear that the administration wanted computers. In the separate «Report and Motion for the Creation of a Unit Concerning the Coordination of Punched Card and EDPM Use in the Federal Administration», the chain of argumentation was extended.[43] According to rumors, the Central Office knew to report that the acquisition of computers was an issue not only in the Statistical Office but also in the Alcohol Board (*Alkoholverwaltung*), the Treasury and Accountancy Service (*Kassen- und Rechnungswesen*), the Printing and Supplies Office (*Drucksachen- und Materialzentrale*), and in various companies of the War Technology Division (*Kriegstechnische Abteilung*).[44]

The Central Office for Organizational Affairs therefore assumed that «a breadth and depth development [was] emerging throughout the administration in the punched card and EDP area which [could not] be left to itself.»[45] The computer system that the Statistical Office wanted to acquire in renewing its equipment was made the central focus of an «inescapable trend» by the Central Office.[46] The administration could neither stop the computers nor leave them to themselves. The reason for this was that in comparison to punched card machines, the computers «would enable and categorically demand a more intensive cooperation between the punched card and EDP services».[47] Whereas in the first report Hongler still stressed the usefulness of computers for the federal administration, by the second report the decision in favor of the computer had already become an inevitability.

The mantra of the Central Office was clear: every department, every position in the administration should be able to access computers, whether in the Alcohol Board or the War Technology Division. But due to their high

43 BAR E6500-02#1986/114#74*, Report and Motion on the Coordination of Punched Card and EDPM Use, 28/11/1960.

44 Ibid.

45 Ibid.

46 Ibid.

47 Ibid.

price, the computers had to be used at a central location in a computer center. The Central Office wanted to prevent each department from evaluating, ordering, and operating its own machines. The Central Office framed the computers to perform balancing acts between general availability and individual use. In other words, the resources of the general-purpose machines had to be made available to the individual needs of the departments. The problem that the computer represented in this interpretation was the problem of access. How were departments to access computing power in the computer center?[48] The solution lay in bureaucratically regulating the coordination of the administration's computers.

For this purpose, Hongler first analyzed the actual situation, then critiqued it and transformed the critique into a «proposed solution for the reorganization of the punched card services of the federal central administration». How would the Central Office do that? It disavowed the «isolated action of the departments», as the Statistical Office had done until the intervention of the Department of Finance. In the future, such an approach would «no longer [be] responsible». «The tasks, competencies and responsibilities in the area of punched card and EDP deployment of the federal administration» had to be redefined: «It is therefore necessary to propose ways and means that will allow the sum of all activities of the punched card offices to be optimally designed.» For the Central Office it was clear that the computers had to be operated centrally in a computer center – under the umbrella of the Statistical Office but as a service provider for the entire administration. According to the Central Office, to make the computers usable for other de-

48 The problem of access to computing power was widespread around 1960. At the Massachusetts Institute of Technology (MIT), the problem of accessing the large central computer led to the development of time-sharing. Various users could access computing power via decentralized terminals without having to stand in line at the computer. Key to this development was the supervisor, a program that controlled all activities and could interrupt one procedure in favor of another, so that all users had access to expected computing power. The problem of access was technically solved at MIT, as the supervisor distributed the central computing capacity fairly to the decentralized users. See Fernando J. Corbato et al., An Experimental Time-Sharing System, in: AIEE-IRE '62 (Spring) Proceedings of the May 1–3 Spring Joint Computer Conference, 1962, 335–344.

partments, coordination «had to be created, planned, and ensured to a large extent».[49]

Hongler ruled out self-coordination among the departments in order to achieve the optimal design of the organization from a functional and economic perspective. The «natural tendency» for the departments to try to maintain «their autonomy and independence», he argued, was too great. He was concerned that only «the circumstances of one's own department» would be considered.[50] This would make the computer too individualized, and only a few would be able to access it. For the same reasons, Hongler spoke out against the formation of a commission. The interests of the departments would not be compatible with the task of coordination. Neither self-coordination nor a commission was a workable solution for organizing the operation of the computers in the federal administration. What would be, then? Hongler proposed an office which, first, would have to have «an overview of the entire punched card services of the federal administration»; second, would have to know «the problems and plans of the individual departments»; third, would have to follow «the progress of automation technology»; and, finally, would have to plan and coordinate «the development of punched card services in the interest of the entire administration over the long term».[51]

The modernization of the administration should be accompanied by technocratic centralization. The report does not specify where the office should be set up, but states that it would be a demanding task: «This office must have thorough knowledge of organizational matters and of punched card and EDP technology, and must be equipped with the necessary skills to perform its task. Its coordinating role also requires psychological skills and experience in proposing and implementing organizational changes».[52] The requirements focused on organizational affairs and, more specifically, on «proposing and implementing organizational changes» and knowledge of computer technology. In addition to Hongler, Hans Kurt Oppliger, a 33-

49 BAR, Report and Motion.

50 Ibid.

51 Ibid.

52 Ibid.

year-old former employee of Bull, had also been working in the Central Office since 1957.[53] It must have been obvious that Hongler had defined a new office for which only the Central Office could be responsible.

On 8 December 1960, the reports and motions were summarized. The computers for the census could no longer be negotiated without the creation of a «coordination office for automation».[54] On 16 December, the Federal Council dealt with the case and decided to order the IBM 7070 and 1401 machines.[55] Although the question of location was still unresolved – the Statistical Office, the Construction Directorate and the Central Office were still to negotiate the space – the computer center was «provisionally» placed under the control of the Statistical Office. The final subordination should be clarified by the Central Office «with the interested parties», and a report and application should again be submitted to the Federal Council.[56] In addition, the Federal Council decided that «the planning, monitoring, and promotion of the activities of all punched card and EDP services of the Federal Administration [...] should be transferred to the Central Office for Organizational Affairs as a coordinating office».[57] Oppliger became its first head. The way of operating around the by then only ordered computers was characterized by centralized coordination.

In this short period of time, the Central Office took advantage of the opportunity to exploit the tension between general availability and individual use of the computer in order to gain legitimacy. The Central Office was able to interpret the computer as a vehicle for gaining control and ultimately to better fulfill its task of reforming the federal administration. It had managed

53 See Sarah Brian Scherer, Hans Kurt Oppliger, in: Historisches Lexikon der Schweiz (HLS), 2008, https://hls-dhs-dss.ch/de/articles/011720/2008-10-23/ (9/4/2020).

54 BAR E6500-02#1986/114#75*, Report and Motion Summarized, 8/12/1960.

55 «The Print and Material Headquarters is authorized to order the EDP system IBM 7070-1401 and the necessary auxiliary machines – immediately, subject to the approval of the budget by the Federal Assembly». BAR E6502-02#2002/226#16*, Resolution Federal Council, 16/12/1960.

56 «The Central Office for Organizational Affairs of the federal administration clarifies the question of definitive subordination with the interested parties and then submits a report and proposal to the Federal Council». Ibid.

57 Ibid.

to negotiate and expand its own responsibility vis-à-vis the computer. The balancing act between the necessary specialization of the computer, for example, for the census in the Statistical Office, and the requirement that the expensive computer system be used to rationalize the entire administration offered the opportunity for this. With the expected «breadth and depth development» of computer use, control over computerization promised influence for the Central Office in the same dimension – across the breadth of departments to the depth of divisions and offices.[58]

Between project and line

The Central Office managed to establish the organizational framework for the implementation of the computer within the Swiss federal administration two years before the first computers were put into operation. By successfully linking the problem of modernizing to the computer, it was empowered to restructure the administration in the near future. The computers were not to be installed as part of the Statistical Office's equipment but rather in the federal administration's newly created electronic computer center – right next to the federal parliament building, in the courtyard of the Bernerhof, which had been rebuilt for this purpose.[59] Although the computer center remained organizationally under the umbrella of the Statistical Office, it was intended to provide service for the entire administration. From now on, any future use of computers had to be planned, monitored, and supported centrally. For this purpose, the specifications of the Central Office were extended. Its area of responsibility now also included the coordination of all the federal administration's efforts in the field of automation. For computer problems, and specifically for the problem of access, no other routines or protocols existed. These problems were the first of their kind. And they were solved, at least temporarily, on an organizational level between the Statistical Office, the Department of Finance, the Department of Home Affairs, the Federal Council, and the federal administration's Central Office for Organizational Affairs.

58 BAR, Report and Motion.

59 See Schwery, Die Maschine regieren.

In less than four months, between September and December 1960, the negotiation ground for the future use of computers was defined. Not in response to the computer, but in anticipating computer use and computer access from a holistic standpoint. Not as an answer to the growth of the administration, but in the context of it. The Central Office succeeded in defining the computer as a general-purpose machine. In doing so, it not only succeeded in finding a new strategy for future administration reorganizations but also significantly increased its influence. It virtually became the supervisor of the operating system, deciding what could be done with the computer, when, where, and by whom – without operating computers itself. The computer became the second, far more effective link between the Central Office and the departments, alongside the organizational assistants. The interaction between the administration and the computer was structured long before the first computers went into operation in spring 1962.

That same year, Roger Bonvin was elected to the Swiss Federal Council, making a name for himself as someone who cared about the Swiss cantons and regions.[60] Computers, however, disappeared from his agenda. In his *kleine Anfrage*, he had imagined computers to be used in already existing structures, as tools for change inside the Statistical Office. The computer was a vehicle for becoming and appearing modern. Bonvin thus stood for the «compromise formula» that had shaped Switzerland in the postwar period, in which the liberal ideology of (technological) progress combined with an ideology of cultural and structural preservation.[61] For Bonvin and his career, it did not matter that the first computers in the federal administration came into operation other than the way he had intended.

Like Bonvin, the Central Office also had to find a balance between change and preservation. Upcoming problems having to do with computers, for example, how to translate processing pay slips into a program to process them with computers, had to be reconciled with well-established line hierar-

60 He was well known for always standing up for the mountain cantons, for example, during the «Gotthardkreuz» railway project. In what became known as the «Furka affair», only the Furka base tunnel was ever completed, and even that only with technical difficulties and enormous budget overruns. See Andrey, Bonvin.

61 Mario König et al., Dynamisierung und Umbau. Die Schweiz in den 60er und 70er Jahren, Zurich 1998, p. 12.

chies. Programming computers was a project-based activity. The classic top-down chain of command was unavoidable, but it promised little success in these temporary spaces between the computer and the administration. In order to move administrative processes to the computer, programmers and analysts in the computer centers had to cooperate with departmental civil servants to bring knowledge of computer programming and of administrative workflows together in project groups between the lines. In this constellation, transferring processes according to a different logic – that of the computer and that of the administration – offered an option to change how things were done with the excuse that either the needs of the computer or the needs of the office automating a workflow required it. The computer became a vehicle for self-reflection, and subsequently a way to change the administration and the way it did its work under the radar of politics. Because cooperation between highly heterogeneous institutions and actors stood at odds with the line organization, the Central Office and its directives had to find ways to regulate the interactions in a way that continued to respect the decision-making of the line hierarchies. Within the context of the computer, certain new project structures and a new type of the old, bureaucratic civil servant were recognizable. The buzzwords were «general-purpose» and «individual use», «programming» and «analyzing», «center» and «coordination». In the early interactions between the computer and the administration, a testing ground opened up around these buzzwords for heterogeneous actors to find ways to cooperate and to manage projects. A nascent digital federalism had to link up with the burgeoning routines and standards inside this organizational framework. These were routines and standards for managing, initializing, and unwinding computer projects in different phases, at three different levels of cooperation between heterogenous actors – the totality of computer projects within the federal administration, a computer project as a unit (including the definition of objectives), and execution of an already defined computer project.

Within the federal administration, the next big question after ordering the first computer in 1960 became how to transform the general-purpose machine into a specialist for doing work for the federal administration. The problem of programming and programmers, at the intersection of computer and organizational structure, loomed on the horizon.