# Innovation, gender, and emotional responses: The computerization of the Austrian Federal Railways, 1969–1991

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## Introduction

This chapter examines how computerization reshaped the Austrian Federal Railways (ÖBB) between 1969 and 1991, focusing on the General Directorate. It argues that digital transformation at ÖBB was not merely a technical or administrative project but a deeply social and emotional process that reconfigured work practices, organizational identities, power relations, and gender hierarchies. While management publicly framed digitalization as a straightforward enhancement of efficiency and transparency, employee perspectives reveal a more ambivalent experience marked by adaptation, skepticism, and uneven redistribution of authority. Previous research on ÖBB has primarily focused on processes of economic rationalization and legal restructuring – such as the transition from the Federal Railways Service Act to collective bargaining agreements[1] – without analyzing how computerization reshaped administrative cultures and gendered labor structures. This chapter addresses that gap.

The guiding question is: How did the introduction and consolidation of electronic data processing and office automation reconfigure administrative practice, gendered divisions of labor, and employees' emotional repertoires at ÖBB – and through which organizational mechanisms did these changes occur? Three subsidiary concerns structure the analysis: first, how managerial narratives of efficiency interacted with existing routines and governance constraints; second, how digitalization intersected with entrenched gender hierarchies in hiring, promotion, and everyday task allocation; and third, how employees retrospectively narrated loyalty, identification, and resistance in response to technological change.

Methodologically, the chapter triangulates multiple source groups to capture both institutional dynamics and lived experience. Internal ÖBB records –

1 Dornig, "Vom Bundesbahndienstrecht zum Kollektivvertrag."

investment plans, almanacs, and organizational charts[2] – are used primarily to reconstruct timelines, decision paths, and the scaling of infrastructure. Policy and oversight materials – Women's Reports (1975, 1985),[3] Administrative Reform Reports (1980, 1987),[4] and legal frameworks such as the Equal Treatment Act (1979)[5] and Austria's 1982 ratification of the UN Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)[6] – situate ÖBB within national debates on labor, equality, and public administration. Oral history interviews conducted in 2023[7] supply retrospective narratives of everyday work, emotional coping, and professional identity; company communications (e.g., staff magazines, training and information materials[8]) help trace internal messaging and pedagogical strategies around computerization. Each corpus has limitations – managerial documents privilege official perspectives; oral histories are retrospective and skew male; policy texts are programmatic – but in combination they enable a layered account of organizational change.

Analytically, the chapter integrates insights from innovation theory, gender history, and the history of emotions. Joseph Schumpeter's concept of "creative destruction"[9] and Clayton Christensen's account of organizational constraints on disruption[10] frame the tension between structural change and institutional inertia. In this chapter, emotions are understood not as isolated psychological states but as collective, institutionally mediated experiences shaped by workplace norms and wider social change. "Computerization" refers to both electronic data processing (EDP; German: EDV) and workflow automation in administrative domains such as payroll, statistics, planning, and ticketing.

Brief institutional context is necessary: as Austria's largest state-owned employer during the period examined and a key postwar public institution, ÖBB

2 Österreichische Bundesbahnen, *Unternehmenskonzept*. For almanacs see, e.g., GD ÖBB, *Almanach der österreichischen Eisenbahnen*; GD ÖBB, *Geschäftsbericht der Österreichischen Bundesbahnen 1972*; GD ÖBB, *Geschäftsbericht der Österreichischen Bundesbahnen 1978*.

3 Bettelheim et al., "Heft 5: Die Frau im Beruf"; Cyba et al., "Heft 3: Beruf"; Feigl, "Heft 8: Zusammenfassung."

4 Österreichisches Bundeskanzleramt, *Bericht der Bundesregierung*, 1980; Österreichisches Bundeskanzleramt, *Bericht der Bundesregierung*, 1987.

5 "108. Bundesgesetz: Gleichbehandlungsgesetz."

6 "443. Konvention zur Beseitigung."

7 To protect participants' confidentiality, interviewees are referred to by pseudonymous first names; these are invented and do not correspond to their legal identities.

8 See, e.g., N.N., "15. An vermeidbare Kosten denken!"; Pucher, "Teamarbeit in der Datenverarbeitung"; Kuntscher, "Die Bedeutung der Österreichischen Bundesbahnen"; N.N., "Fahrdienstleiterausbildung."

9 Schumpeter, "The Instability of Capitalism"; Schumpeter and Esslinger, "Entwicklung."

10 Christensen et al., "Disruptive Innovation"; Christensen, "The Ongoing Process of Building"; Christensen, *Innovator's Dilemma*.

embodied technocratic governance and a strongly hierarchical, male-dominated civil service culture;[11] the establishment of a dedicated EDP unit in the General Directorate in 1970 inaugurated a systematic effort to digitize workflows that accelerated through the 1970s and 1980s.[12] Nonetheless, examples from the ÖBB history illustrate resistance to change. In 1971, the board requested proposals for administrative simplification, yet the responsible "Zentrale Planungsstelle" dissolved in 1973 without ever receiving a clear mandate. Similarly, a 1972 initiative by the "Arbeitskreis für Organisation" to address staffing issues was halted after their proposals were neither approved nor empowered. Further, a 1975 "Projektgruppe Organisation" was tasked with critically analyzing and improving organizational efficiency but was disbanded in 1976 before it could develop any substantial proposals, following the rejection of its preliminary report due to significant flaws.[13]

Against this backdrop, the chapter proceeds in three steps that build on one another. The next section is the most extensive because it reconstructs the institutional and technological trajectory from 1969 to 1991 – contextualizing ÖBB within postwar modernization and state reform, tracing early pilot programs and their institutionalization in the 1970s and 1980s, and analyzing how digital tools increased transparency, automated clerical work, and reorganized administration. In doing so, it sequences investments, standardization strategies, and governance constraints, and situates ÖBB within broader regulatory and labor contexts. The section "Gender dynamics and institutional change" then mobilizes quantitative and institutional evidence – almanacs, salary grades, and ministerial reports[14] – to show how digitalization intersected with entrenched hierarchies; it is deliberately substantial, though shorter than section two, because it translates that baseline into a focused analysis of distributional effects within the organization. The section on emotional responses is concise and case-driven: drawing on oral histories, it illuminates how employees retrospectively narrated loyalty, identification, and resistance in everyday encounters with computerization. Its relative brevity reflects its interpretive purpose – deepening, rather than duplicating, the institutional mapping developed in the previous two sections.

11 Puwein, "Erfolge der ÖBB-Reform 1992."

12 GD ÖBB, *Almanach 1970*, 14; Pucher, "Elektronische Datenverarbeitung im Großbetrieb," 16.

13 Republik Österreich, *Bericht des Rechnungshofes*, 6–10 (Abs. 20.1, 21.1, 21.2, 23.1.1, 23.1.4, 23.1.5, 23.2.1).

14 See, e.g., GD ÖBB, *Almanach 1970*; Bettelheim et al., "Heft 5"; Österreichisches Bundeskanzleramt, *Bericht der Bundesregierung*, 1980; Österreichisches Bundeskanzleramt, *Elektronische Datenverarbeitung im Bundesbereich*.

## Innovation, disruption, and strategic shifts

The implementation of digital systems at ÖBB aligned with global computerization trends, leading to administrative restructuring and increased efficiency.[15] Christensen's theory of disruptive innovation helps explain why established bureaucracies often resist technological change[16] – a challenge ÖBB faced until the late 1970s. The transition to digital workflows required strategic management to overcome institutional inertia and to ensure that employees adapted effectively.[17] Similarly, Joseph Schumpeter placed innovation at the core of economic development: new products, production methods, and markets drive economic progress. His concept of "creative destruction" describes how existing structures are "destroyed" and "replaced" by new ones – fostering progress but also introducing instability and non-linear change as industries adapt and outdated technologies are phased out.[18] This dynamic was evident at ÖBB, where older administrative systems gave way to computer-based workflows.

Consequently, a key shift was the prioritization of computer-based systems in planning and organization. By 1969, ÖBB had begun focusing on electronic systems and cybernetics to enhance efficiency.[19] In official rhetoric, management cast these moves as efficiency- and transparency-enhancing; inside the organization, many employees perceived heightened monitoring and pressure rather than genuine openness or empowerment. This ambivalence is evident in the reflections of employees directly involved in modernization efforts, as illustrated by the following quote:

> Of course, digitalization also led to proper accounting and economic efficiency – without meaning this critically, but very objectively – these costs became much more transparent, and often much more transparent for those responsible. Yes, then there was this office automation. And yes, it then continued relatively quickly, where the computer world – as is well known – essentially overtakes itself.[20]

15 Balbi and Magaudda, *A History of Digital Media*.

16 Christensen et al., "Disruptive Innovation"; Christensen, "The Ongoing Process"; Christensen, *Innovator's Dilemma*.

17 Republik Österreich, *Bericht des Rechnungshofes*, 6–10 (Abs. 20.1, 21.1, 21.2, 23.1.1, 23.1.4, 23.1.5, 23.2.1).

18 Schumpeter, "The Instability of Capitalism"; Schumpeter and Esslinger, "Entwicklung."

19 N.N., "15. An vermeidbare Kosten denken!"

20 Original: "Und so wurde mit der Digitalisierung natürlich auch im Sinne einer ordentlichen Buchhaltung und einer Wirtschaftlichkeit – ohne das jetzt kritisch anzumerken, aber natürlich sehr nüchtern – wurden diese Kosten viel transparenter, und oft für die Verantwortlichen viel transparenter. Ja, dann hats eben diese Büroautomatisation geben. Und ja, jetzt ging das dann aber relativ rasch weiter, wo sich ja die Computerwelt – allseits bekannt – eigentlich

The quoted reflection offers valuable insight into how digitalization was perceived at ÖBB by those directly involved in technological modernization processes. The interviewee – who began as a clerical assistant and later worked on automation projects in the General Directorate – combines personal experience with an organizational view. His tone is not simply neutral or descriptive; rather, he implicitly defends the shift toward digital tools, especially in areas such as accounting and cost control. By emphasizing that these tools enabled "proper accounting" and made costs "much more transparent," he frames digitalization as a rational and necessary development – subtly distancing himself from more critical or nostalgic perspectives on the pre-digital past.

The reference to "office automation" alludes to the transformation of clerical work through systems for word processing, data management, and workflow optimization. His remark that the "computer world […] overtakes itself" expresses both admiration for the speed of technological innovation and an awareness of the institutional strain such rapid changes could impose. Overall, the statement frames computerization as a pragmatic, largely beneficial development – highlighting how transparency, efficiency, and organizational adaptability were valued by those actively shaping ÖBB's technological future.

The broader economic climate of the 1970s and 1980s significantly shaped ÖBB's modernization efforts. As postwar economic expansion gave way to digital capitalism and financial globalization in the 1980s,[21] productivity expectations and business practices evolved: investment in technological infrastructure became a necessity to remain competitive. At the same time, global regulatory and labor contexts mattered: as Robin Williams and David Edge have argued, the separation of software and hardware markets in the United States reshaped the computing industry,[22] while David Noble shows how labor structures influenced programmable machine tools in the United Kingdom and West Germany.[23] Together, these dynamics underline that technological change is institutionally and labor-embedded – also at ÖBB.

Concurrently, societal changes influenced ÖBB's strategic priorities, particularly in addressing gender disparities. Despite initiatives such as the Women's Advancement Program (1981), which aimed to counteract the underrepresentation of women in technical fields,[24] entrenched gender norms continued to shape the

selbst überholt." Jahrbacher, Interview with Emil. A similar observation can be found in an ÖBB employee newsletter. See Pucher, "Elektronische Datenverarbeitung."

21 Doering-Manteuffel and Lutz, "Nach dem Crash."

22 Williams and Edge, "The Social Shaping of Technology," 880–84.

23 Nobel, "Social Choice in Machine Design"; Bergmann et al., *Digitalisierung der Arbeitswelt*, 7. See also Flecker, *Arbeit und Beschäftigung*, 204.

24 N.N., "Frauen am Zug."

composition of the workforce. This persistence was evident even amid progressive legislation, including the Equal Treatment Act of 1979 and Austria's 1982 ratification of the UN Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), which obligates states to dismantle structural and legal gender inequalities.[25] The policy frameworks provide the backdrop for the closer examination of how digitalization interacted with entrenched gendered hierarchies inside ÖBB.

At ÖBB, women remained concentrated in administrative roles, while technical and leadership positions were predominantly occupied by men.[26] The introduction of computer systems and digital workflows often reinforced rather than disrupted these divisions: automation displaced many clerical jobs traditionally performed by women, while newly emerging technical roles were typically filled by men.[27]

While the adoption of digital technologies at ÖBB aligned with Schumpeter's "creative destruction"[28] in terms of administrative restructuring and workflow modernization, the transformation did not extend equally across all organizational dimensions. Legacy systems were dismantled and efficiency improved, yet deeply embedded hierarchies – particularly the gendered division of labor – remained largely intact. This calls for a more nuanced account of disruption: digitalization at ÖBB disrupted routines while stabilizing – or even reinforcing – preexisting power asymmetries.[29] Technological change produced structural shifts and institutional anxiety, as Schumpeter and Christensen suggest,[30] but also revealed clear limits when confronting entrenched hierarchies, underscoring the need to integrate gender and emotional dimensions into analyses of organizational change.

Moreover, strategic decisions at ÖBB increasingly emphasized employee training and technological adaptation.[31] A key example was the introduction of floor copiers with counters. Previously, clerks or specialized officers relied on designated staff to handle copying tasks. With digitalization, it became common for engineers

25 "BGBl. Nr. 108/1973," 683–87; "443; BGBl. Nr. 443/1982," 2079–101. For more information, see: UN Women Germany, CEDAW – The UN Convention on the Elimination of All Forms of Discrimination Against Women, available at: https://unwomen.de/cedaw/. The full text of the convention is available at: https://unwomen.de/tcl-content/uploads/2022/03/cedaw.pdf.

26 Bettelheim et al., "Heft 5," 10–14, 48; Cyba et al., "Heft 3," 53–57, 92–95; Feigl, "Heft 8," 16–19, 112.

27 Cyba et al., "Heft 3," 153–63.

28 Schumpeter, "The Instability of Capitalism"; Schumpeter and Esslinger, "Entwicklung."

29 Cyba et al., "Heft 3," 153–63.

30 Schumpeter, "The Instability of Capitalism"; Schumpeter and Esslinger, "Entwicklung"; Christensen et al., *Disruptive Innovation*; Christensen, *The Ongoing Process*; Christensen, *Innovator's Dilemma*.

31 Pucher, *Elektronische Datenverarbeitung*; Jahrbacher, Interview with Franz and Josef. Teil 1; Jahrbacher, Interview with Franz and Josef. Teil 2.

and administrative staff to send documents digitally to the print shop and retrieve them independently. While this may seem routine today, at the time it marked a significant shift: employees began using office IT tools autonomously, and staff from the former typing department were reassigned to a newly created automation group responsible for maintaining these systems.[32]

This transition reduced repetitive administrative tasks, particularly for technical and managerial staff, who gained greater autonomy. For former support personnel, however, the change often meant reassignment rather than upward mobility. Although official reports framed digitalization in technical and efficiency-oriented terms, these narratives were far from neutral: they portrayed technological innovation as self-evidently positive, emphasizing institutional progress while largely overlooking the human dimension of change.

Building directly on these developments, this transition required substantial investment in both technical infrastructure and employee training, but it led to significant improvements in administrative productivity and overall service quality.[33] Throughout the 1970s and 1980s, ÖBB pursued the standardization of software and hardware systems in order to streamline workflows, reduce repetitive tasks, and minimize manual processing. The period also saw the introduction of West German Nixdorf systems supporting ticketing and administrative data management – briefly noted here and discussed in detail below.[34] A key organizational shift during this period was the move from decentralized, manual procedures to more centralized and automated forms of administration, as another interviewee emphasized:

> There was also a large copying office and a small printing office in the General Directorate. All directives that were issued were produced in this copying office. […] We had, in the late 70s and mid-80s, about 2,200 service locations in the ÖBB network.[35]

32 Jahrbacher, Interview with Emil.

33 Pucher, "Elektronische Datenverarbeitung im Großbetrieb"; Jahrbacher, Interview with Franz and Josef. Teil 1; Jahrbacher, Interview with Franz and Josef. Teil 2.

34 Nixdorf Computer AG, founded by Heinz Nixdorf, was one of West Germany's leading providers of compact business-oriented electronic data processing systems in the 1970s and 1980s, with a focus on banking, retail, and public administration. Jahrbacher, Interview with Ferdinand.

35 Original: "Es gab dann auch in der Generaldirektion eine große Kopierstelle und eine kleine Druckerei. Denn alle Anweisungen, die rausgingen, wurden hier in dieser Kopierstelle, wurden die gefertigt. Das heißt wir hatten in den, in den Ende 70ern und Mitte der 80ern circa 2.200 Dienststellen im ÖBB-Netz." Jahrbacher, Interview with Emil.

Between 1972 and 1978, ÖBB's IT workforce grew from 155 to 233 employees,[36] while revenues[37] increased by approximately 63%.[38] Nonetheless, administrative and organizational structures lagged behind. Structural reforms – including the creation of a board of directors and trustees – were implemented to address these gaps.

Because of the growth in the IT sector and the increasing adoption of computer systems, ÖBB experienced a general decline in overall staffing levels between 1960 and 1974, particularly in operational and administrative departments. This reduction formed part of broader rationalization strategies aimed at increasing efficiency and reducing labor costs, but it also led to unintended consequences such as increased overtime and growing reliance on external service providers.[39] Digital technologies were introduced to automate workflows, standardize procedures, and provide real-time data to support managerial decision-making. By the early 1980s, ÖBB's digital landscape encompassed approximately 1,800 programs, primarily focused on commercial and administrative functions.[40]

To manage these developments, ÖBB considered a variety of strategies, including structural reforms, employee incentive programs, and changes to training approaches. Modern management techniques were introduced, and interdisciplinary pilot projects were launched to encourage cooperation across departments. Training and examination systems were restructured to develop staff according to functional roles – though in practice this often remained vague. While ÖBB officially aimed to align services with market demand and enhance performance through rationalization and revenue growth,[41] internal skepticism persisted. Many employees viewed the initiatives with suspicion, particularly as they were often accompanied by increased workloads, tighter control mechanisms, and limited opportunities for participation in decision-making.[42]

A ten-year computerization program – budgeted at 60 million Austrian Schillings (ATS), or approximately 3.5–4 million USD at 1975 exchange rates –

36 Of these, 138 were computer personnel and 17 were other personnel in 1972, and 204 and 29, respectively, in 1978. Österreichisches Bundeskanzleramt, *Elektronische Datenverarbeitung im Bundesbereich*, 343.

37 In this context, "revenues" refers to the total income generated by the Austrian Federal Railways between 1972 and 1978, reflecting a notable improvement in the company's economic performance.

38 See, e.g., GD ÖBB, *Geschäftsbericht der Österreichischen Bundesbahnen für das Jahr 1972*; GD ÖBB, ed., *Geschäftsbericht der Österreichischen Bundesbahnen für das Jahr 1978*. Wien 1979.

39 Österreichische Bundesbahnen, *Unternehmenskonzept*, 31.

40 Österreichische Bundesbahnen, 32–33.

41 Österreichische Bundesbahnen, 76–80.

42 Jahrbacher, Interview with Franz and Josef. Teil 1; Jahrbacher, Interview with Franz and Josef. Teil 2; Jahrbacher, Interview with Emil.

was designed to free up the equivalent of at least 1,100 staff positions and to generate an annual financial benefit of no less than 315 million ATS (roughly 18–20 million USD, or 0.06% of Austria's GDP at the time).[43] Officially, the investment program referred to a "release of work capacity," which implied neither direct layoffs nor forced redundancies, but rather reductions through natural attrition (e.g. retirement) and internal reassignments. Nevertheless, the overarching objective was a significant reduction in staffing levels, framed as part of a broader rationalization strategy.[44]

By 1978, ÖBB's total computerization expenditure had already reached 128.5 million ATS, including 57.5 million ATS for hardware and 46.2 million ATS for personnel.[45] While this exceeded the original projection, it reflects the rapid scaling-up of digital infrastructure. The fact that hardware investments outpaced personnel spending was not unusual by international standards but illustrates a broader institutional shift: ÖBB increasingly prioritized technological systems over human labor – a development that, while framed in terms of efficiency and modernization, also triggered uncertainty and emotional ambivalence among employees.

The role of technology in ÖBB's General Directorate evolved significantly from the 1970s to the 1990s. Initially focused on automating routine tasks, computerization later supported skilled labor and internal information flows.[46] As social scientist Gabriele Winker argues, technology alone does not determine centralization; decision-makers, particularly in central offices, shape how digital tools are integrated.[47] This was evident at ÖBB, where strategic decisions in the 1990s led to the standardization and centralization of digital systems, fundamentally transforming operations and management.[48]

The transformation of ÖBB was shaped not only by internal restructuring efforts but also by broader socio-economic pressures. During the 1970s and 1980s, external shocks such as the oil crises and growing global competition placed increasing

43 Österreichische Bundesbahnen, *Unternehmenskonzept*, 83.

44 This was particularly relevant for civil servants, who were granted tenure of office, making their positions virtually impossible to terminate. Until 1979, this was codified in the "Dienstpragmatik" and, from 1979 onward, in the "Beamtendienstrecht." "Bundesgesetz: Beamten-Dienstrecht 1979," 1559 (§10 Abs. 2–4).

45 Österreichisches Bundeskanzleramt, *Elektronische Datenverarbeitung im Bundesbereich*, 348. Computerization investments required multilayered approval under the Federal Railway Act: authorization by the Transport and Finance ministries within annual federal budget limits. This framework applied to all major expenditures and limited ÖBB's financial and strategic flexibility. Österreichische Bundesbahnen, *Unternehmenskonzept*, 122, 128, 138; Jahrbacher, Interview with Franz and Josef. Teil 1.

46 Pucher, *Elektronische Datenverarbeitung*, 16; Jahrbacher, Interview with Franz and Josef. Teil 1.

47 Winker, *Büro. Computer. Geschlechterhierarchie*, 16, 22, 49.

48 Jahrbacher, Interview with Ferdinand; Jahrbacher, Interview with Franz and Josef. Teil 1.

strain on Austria's economy.[49] Although ÖBB remained a major employer and essential public service provider, state-owned enterprises were under growing pressure to operate more efficiently and to adapt to market-oriented principles. As the era of postwar prosperity gave way to the challenges of computerization, neoliberal economic policies, and financial globalization, expectations shifted: public companies like ÖBB were now expected to demonstrate fiscal discipline, managerial accountability, and international competitiveness.[50]

In response to these developments – and in preparation for Austria's accession to the European Union – the Austrian government introduced wide-ranging structural reforms. In 1992 – just beyond this chapter's timeframe[51] – the Vranitzky III administration enacted the Federal Railways Act, transforming ÖBB from a state-administered economic entity into a legally independent organization. While still fully owned by the Republic of Austria, ÖBB was restructured as a special-purpose legal entity – combining features of a limited liability company and a joint-stock cooperation – operating under private law.[52] This reform pursued two main goals: aligning with EU directives and reducing the state's financial burden by increasing the company's competitiveness. The new organizational structure allowed ÖBB to adopt private-sector management practices focused on cost-efficiency, internal performance metrics, and market responsiveness. At the same time, however, financial constraints also reshaped employment structures through staff reductions, outsourcing, and the redistribution of responsibilities within the organization.[53]

At the level of concrete systems and workflows, these dynamics were especially visible: one illustrative example of such institutional and technological transformation was the implementation of the Nixdorf ticketing and data management systems in the 1980s, whose digital communication capabilities enabled employees to manage data and information more strategically. One interviewee recalled how ÖBB was among the first institutions to adopt this ticketing systems: instead of issuing tickets manually, employees could simply select a route – such as Vienna to Berlin – and the system completed the transaction. However, this phase of technological modernization came to an end when Nixdorf Computer AG – once a leading German manufacturer – faced severe financial difficulties in the late 1980s. The company was unable to recover from sustained losses and was acquired by Siemens in

49 Elster, *Der Arbeitskraftunternehmer und seine Bildung*, 23.

50 Doering-Manteuffel and Raphael, "Nach dem Crash."

51 1992 lies just beyond the 1969–1991 window, which is deliberately chosen to capture the pre-reform phase leading up to the reorganization associated with EU accession preparations.

52 "825. Bundesgesetz zur Neuordnung."

53 "825"; 'Puwein, "Erfolge der ÖBB-Reform 1992."

1990, effectively ending its independent operations and its direct role in railway administration systems.[54]

This example captures the ambition – and the constraints – of ÖBB's top-down modernization. Written sources largely mute the affective dimension, whereas oral histories reveal uneven, often ambivalent responses (see below). The close of the Nixdorf phase thus serves as a hinge to the ensuing discussion of research on labor, gender, and digitization.

Research by Gerlinde Hauer and Michael Mesch demonstrates that technological progress has historically often coincided with rising employment levels and declining working hours, particularly during the twentieth century.[55] Mesch, focusing on the postwar era of Fordist capitalism, highlights how productivity gains were frequently accompanied by job creation, real wage growth, and shorter working hours – developments made possible by strong labor institutions, collective bargaining systems, and redistributive policies. However, he emphasizes that these outcomes were not automatic but relied on favorable macroeconomic conditions and a relatively equitable income distribution. In contrast, more recent phases of automation – particularly under neoliberal policy regimes – have not consistently delivered comparable employment benefits.[56] Hauer similarly identifies a historical pattern in which technological change has supported employment growth, but stresses that this trend is neither automatic nor universally applicable. Instead, the labor effects of innovation depend on how new technologies are implemented, which sectors they affect, and the broader political and institutional context.[57] Both authors caution against assuming a linear or inevitable relationship between technological advancement and net employment gains – particularly under late twentieth- and early twenty-first-century economic conditions shaped by globalization, deregulation, and weakened collective bargaining.

Isabel Morf adds another dimension to this analysis by examining how digital technologies were already beginning to reshape organizational structures by the late 1980s. Writing in 1991, she observed early signs that digitalization could flatten hierarchies and enable new forms of data generation, storage, and distribution. Although her study captured a contemporary view of emerging developments, her insights remain relevant for understanding broader transformations that unfolded throughout the 1980s and into the 1990s. According to Morf, digital technologies increasingly structured work rhythms and environments around machine logic and algorithmic processes rather than human-centered workflows – signaling a deeper

54 Jahrbacher, Interview with Ferdinand.

55 Hauer, "Digitalisierung – Selbstläufer Richtung Gleichstellung?"; Mesch, "Automatisierung und Beschäftigung"; Mesch, "Editorial. Automatisierung und Beschäftigung."

56 Mesch, "Automatisierung und Beschäftigung"; Mesch, "Editorial."

57 Hauer, "Digitalisierung."

shift in the relationship between labor and technology.[58] Therefore, computers did not simply replace human labor; instead, they became embedded in administrative workflows, transforming the nature of work rather than eliminating it. Recent studies on digital work environments in Austria and Eastern Europe – such as the 2019 report by Bergmann et al.– confirm that the effects of digitalization are neither uniform nor technologically determined.[59] Rather, technological change interacts with institutional, political, and social factors that shape how digital tools are implemented and experienced across sectors and regions.

Ultimately, the adoption of digital technologies at ÖBB between 1969 and 1991 reflects broader patterns of digital transformation in public institutions. The gradual but definitive shift from traditional administrative structures to IT-supported workflows enhanced efficiency and data accessibility, but also required continuous organizational adaptation and new workforce competencies. ÖBB's experience demonstrates that modernization is never merely a technical process. It is shaped by economic structures, labor relations, and societal norms – and must therefore be understood as both a technological and institutional transformation.

## Gender dynamics and institutional change

The ÖBB workforce in the 1970s and 1980s was overwhelmingly male, reflecting broader societal gender norms in Austria.[60] In 1986, women made up only 6% of the 67,000 ÖBB employees[61] – underscoring the structural barriers to female participation, particularly in technical and administrative roles. This period of digital transformation coincided with legal efforts to promote gender equality, such as the "Equal Treatment Act" of 1979 and Austria's 1982 ratification of CEDAW.[62]

The Austrian Federal Railways were characterized by a highly gendered division of labor. Women predominantly occupied supportive and administrative positions, while technical and managerial roles remained firmly male-dominated. This pattern reflected not only ÖBB's internal structure but also broader dynamics within Austrian public administration. Reports such as the Women's Reports of 1975 and 1985, as well as the Administrative Reform Reports of 1980 and 1987, provide detailed insights into these gendered distributions.[63]

58 Morf, "Durchsatz erhöhen, Backlog abbauen!"

59 Bergmann et al., *Digitalisierung der Arbeitswelt*, 6.

60 Cyba et al., "Heft 3."

61 N.N., "Frauen am Zug," 46.

62 BGBl. Nr. 108/1979; BGBl. Nr. 443/1982.

63 Bettelheim et al., "Heft 5"; Cyba et al., "Heft 3"; Feigl, "Heft 8"; Österreichisches Bundeskanzleramt, *Verwaltungsreformbericht 1980*; Österreichisches Bundeskanzleramt, *Verwaltungsreformbericht 1987*.

As historian Bernhard Gotto and sociologist Ursula Holtgrewe have shown in their respective studies on postwar West German public administration and 1980s office labor, traditional role patterns were often reinforced through hiring and promotion practices – even in the context of technological modernization.[64] These broader findings resonate with the situation at ÖBB during the same period: The 1975 Women's Report revealed that in 1973, only 736 women were employed as civil servants or contract staff at ÖBB, compared to 55,475 men[65] – a mere 1.3% of the workforce. A breakdown of these roles further illustrates the systemic barriers: 35% of the 736 women worked in lower-level administrative roles, 61% held mid-level administrative positions, and 4% occupied senior or specialist roles. Among female wage employees: 75% worked in supportive roles such as cleaning, station services, and clerical assistance; 25% were employed in lower-level administrative positions.

ÖBB's participation in the 1975 International Women's Year, initiated by the United Nations, resulted in symbolic gestures but failed to produce substantive reform.[66] The 1981 Women's Advancement Program aimed to increase female representation in traditionally male-dominated roles, yet progress was slowed by persistent prejudices and entrenched societal expectations. While digitalization opened up new professional opportunities, it often served to reinforce, rather than dismantle, existing gender hierarchies.[67]

The historical context of gendered office labor helps explain the persistence of structural barriers. From the late nineteenth century onward, office work became increasingly mechanized with the introduction of typewriters, telephones, and shorthand. Women, despite having formal educational qualifications, were typically assigned repetitive and mechanical tasks. Employers benefited from hiring them at lower wages, which limited their career progression and reinforced stereotypes about women's supposed lack of leadership potential. Marriage was frequently invoked as a justification for excluding women from advancement.[68]

A key symbol of this gendered division of labor was the typewriter. Whereas handwriting had once been a valued skill, the rise of typewritten documents diminished its significance and relegated women to clerical roles. Dictation became a male

64 Gotto, "Bürohengste"; Holtgrewe, *Schreib-Dienst.*

65 Bettelheim et al., "Heft 5," 10–14, 48; Cyba et al., "Heft 3," 53–57, 92–95; Feigl, "Heft 3," 16–19, 112.

66 N.N., "8. März 1975 – Tag der Frau."

67 N.N., "Frauen am Zug," 47–48.

68 Therese Jäggi's research on Switzerland, specifically Zurich, highlights these dynamics and provides a detailed examination of the socio-economic factors influencing the employment and advancement of women in office work during this period. Jäggi, "Seit hundert Jahren unten," 71–81.

status symbol, while typing and shorthand – valued primarily for speed – remained associated with female employees.[69]

By the mid-1980s, administrative office work increasingly resembled industrial labor, characterized by rigid hierarchies and standardized workflows.[70] In the context of computerization-driven rationalization, women – often formally well-qualified – were frequently assigned to routine data entry or screen-based writing tasks, while men occupied more prestigious roles in technical development and systems design. As Ursula Holtgrewe's study of office labor in the 1980s shows, the introduction of computer technologies did not challenge gendered hierarchies, but instead often reinforced them – through a gendered division between using and controlling technology.[71]

While the adoption of digital systems at ÖBB aligned with Schumpeter's notion of "creative destruction"[72] in terms of administrative restructuring and workflow modernization, this transformation did not affect all organizational layers equally. Although legacy systems were dismantled and operational efficiency improved, deeply rooted hierarchies – especially gendered divisions of labor – often persisted or were even intensified. The ÖBB case thus illustrates how technological innovation can simultaneously disrupt and stabilize: it enabled new forms of transparency and workflow reorganization, yet reproduced existing inequalities in access, responsibility, and professional recognition.

In ÖBB's case, the interaction between technology and entrenched routines was especially visible: From the 1950s onward – and more intensively from the 1970s – analog data in areas such as payroll and accounting was processed via computers. This redefined work routines, redistributed labor, and altered decision-making processes.[73] Tasks traditionally performed by women – such as clerical data entry and routine administrative documentation – were among the first to be automated during ÖBB's computerization efforts. At the same time, technical and IT-related roles, typically associated with male employees, expanded and gained institutional importance. While the 1980s saw the introduction of selective training programs for women – e.g. in dispatcher training ("Fahrdienstleiterausbildung") and workflow automation – such initiatives remained limited in scope. Structural barriers and gendered occupational segregation persisted: women continued to be overrepresented in low-status clerical roles and underrepresented in technical or decision-making positions. Reports by the Austrian Federal Chancellery repeatedly emphasized this divide, noting that modernization often reinforced, rather than reduced,

69 Jäggi, 76.

70 Morf, "Durchsatz erhöhen," 122.

71 Holtgrewe, *Schreib-Dienst*, 57.

72 Schumpeter, "The Instability of Capitalism"; Schumpeter and Esslinger, "Entwicklung."

73 Bergmann et al., *Digitalisierung*, 6.

existing inequalities in professional advancement and job security.[74] These dynamics also signaled broader institutional restructuring and the emergence of a hybrid digital workplace.[75]

Swiss historian Gisela Hürlimann's analysis of the Swiss Federal Railways (SBB) highlights the transformative impact of digitalization on administrative structures. Like the Austrian Federal Railways, she finds that the integration of digital systems often reinforced traditional hierarchies: women remained in supportive functions, while men dominated technical and strategic positions.[76] Maria Oppen's research offers further insight into the long-term effects of office work on women's employment opportunities in the 1980s and 1990s. She argues that the initial role of office jobs in integrating women into the labor force declined over time due to workplace policies that perpetuated gendered hierarchies. These policies limited advancement opportunities and sustained wage disparities. Oppen also emphasizes that women bore a disproportionate burden of technological change, making them especially vulnerable to job displacement. In response, she advocates comprehensive reforms – including equal pay measures, structured career paths, and targeted support for women adapting to digital transformation. Without such structural change, long-term job stability and upward mobility remained elusive.[77] Historian Susanne Kreutzer, meanwhile, underscores the institutional barriers women faced within male-dominated labor organizations. Female unionists were often relegated to "women's departments," which restricted their influence over broader policy debates and strategic decisions.[78]

The 1985 Women's Report, published by the Austrian Federal Chancellery, documented the first systematic efforts to improve women's status in Austria's public sector, attributing these initiatives to the 1975 World Action Plan. However, the report also highlighted their limited success, noting that progress remained uneven across government departments.[79] One example was the opening of train dispatcher training to women in 1984 – a symbolic step forward. Yet by the mid-1980s, only eight women had completed the program, compared to more than 3,000 male graduates since 1971.[80] This stark disparity illustrates the gap between formal inclusion and actual participation.

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74 Bettelheim et al., "Heft 5"; Cyba, "Heft 3"; Feigl, "Heft 8"; Republik Österreich, *Bericht des Rechnungshofes*, 45–48; N.N., "Fahrdienstleiterausbildung," 2; Österreichisches Bundeskanzleramt, *Verwaltungsreformbericht 1987*.

75 Carstensen, "Ambivalenzen digitaler Kommunikation am Arbeitsplatz," 39; Kaufmann-Buhler, *Open Plan*, 65.

76 Hürlimann, *Die Eisenbahn der Zukunft: Automatisierung*.

77 Oppen, *Zukunft der Büroarbeit*, 1–6; Oppen, "Zukunft von Frauen im Büro."

78 Kreutzer, "Der Aufstieg findet nicht statt," 171–74.

79 Bettelheim et al., "Heft 5."

80 N.N., "Fahrdienstleiterausbildung."

An analysis of ÖBB almanacs reveals a distinct gender hierarchy in the IT workforce of the General Directorate between 1969 and 1975. During this period, men overwhelmingly occupied the upper and middle salary grades – X, IXb, IXa, VIII, and VIIb – with level "I" representing the lowest and "X" the highest pay grade. These positions were linked to technical expertise, strategic responsibility, and seniority – attributes socially and institutionally coded as male at the time. The top salary levels, particularly X and IXb, were held exclusively by men until 1975, reinforcing their dominance in senior IT roles. In the upper-middle ranges (IXa and VIII), men likewise prevailed, occupying positions in technical specialization, operational management, and system development. By contrast, female employees were concentrated in the lower and middle salary categories – specifically VIIa and Vb – which were associated with administrative and support functions such as data entry, clerical work, and routine operations. Women had no access to higher salary grades, underscoring the structural barriers to their career advancement. This sharp division of labor along gender lines reflects a hierarchical system in which technical and strategic roles remained the domain of men, while women were relegated to subordinate, often invisible, tasks.[81]

The structural shift in computerization within the ÖBB General Directorate further illuminates the gendered division of labor. Initially centralized in "Referat 1a" under the General Secretariat in 1969, responsibilities for computer-based systems were gradually distributed across various departments by the mid-1980s. This decentralization aimed to streamline administrative processes and embed technological expertise into daily operations. While these structural changes facilitated the broader integration of IT, they did not disrupt the gendered distribution of roles.[82] At ÖBB, technical knowledge and decision-making authority remained closely aligned with male-dominated career paths.

The administrative reform reports of 1980 and 1987 provide important context for understanding gender distribution within Austria's public administration. Both reports emphasize women's concentration in lower administrative ranks and the slow progress in integrating them into technical and leadership roles.[83] While measures such as equality officers and training programs were introduced, progress re-

81 GD ÖBB, ed., *Almanach der österreichischen Eisenbahnen 1969*; GD ÖBB, XXXIX. Jahrgang, 1970; GD ÖBB, XL. Jahrgang, 1971; GD ÖBB, XLI. Jahrgang, 1972; GD ÖBB, XLII. Jahrgang, 1973; GD ÖBB, XLIII. Jahrgang, 1974; GD ÖBB, XLIV. Jahrgang, 1975. See also Kreutzer, "Der Aufstieg findet nicht statt," 171–74; Pucher, "Teamarbeit," 26–29; Kuntscher, "Die Bedeutung der Österreichischen Bundesbahnen," 17; N.N., "Fahrdienstleiterausbildung," 2.

82 GD ÖBB, *Almanach 1969*, 13–27; GD ÖBB, *Almanach 1983*, 18–34; GD ÖBB, *Almanach 1984*, 18–35; GD ÖBB, *Almanach 1985*, 18–34; GD ÖBB, *Almanach 1986*, 19–35; GD ÖBB, *Almanach 1987*, 19–35.

83 Österreichisches Bundeskanzleramt, *Verwaltungsreformbericht 1980*; Österreichisches Bundeskanzleramt, *Verwaltungsreformbericht 1987*.

mained limited – often symbolic – a pattern mirrored at ÖBB:[84] between 1969 and 1975, core IT roles at ÖBB remained male-dominated, while more women entered auxiliary IT-related support functions; this broadened presence without shifting hierarchies.[85]

ÖBB's internal gender dynamics closely mirrored broader labor market patterns: women were significantly underrepresented in technical and leadership positions. Despite legal reforms and initiatives, traditional hierarchies remained largely intact. The spread of computerization reinforced these disparities, as automation reduced clerical jobs.

Taken together, the findings reveal a persistent and clearly structured gendered hierarchy within the IT workforce of the ÖBB General Directorate. While men held leadership and specialist roles with higher pay, women remained concentrated in lower- and middle-income administrative positions – reflecting entrenched gender norms both within the organization and in Austrian society at large. These patterns reproduced traditional divisions of labor and authority, even as public pressure for change intensified. Political initiatives, the second women's movement of the 1970s and 1980s, and legal reforms signaled growing awareness of systemic inequality. However, these discursive shifts were only partially reflected in institutional practice at ÖBB. The expansion of IT systems, rather than disrupting established hierarchies, tended to stabilize them.

## Emotional responses to technological and social changes

The introduction of computerization at ÖBB elicited a range of emotional responses. Some employees welcomed technological change, appreciating its potential to streamline workflows and reduce repetitive tasks. Others expressed anxiety about job losses and the obsolescence of traditional skills. Oral history interviews conducted with former ÖBB staff – many active during the 1970s and 1980s – reveal a mix of enthusiasm and concern as they recalled adapting to digital tools and shifting workplace expectations.[86] One interviewee described how an Excel-based

84 Kutzner and Schnier, "Geschlechterverhältnisse in Digitalisierungsprozessen"; Österreichisches Bundeskanzleramt, *Verwaltungsreformbericht 1987*.

85 GD ÖBB, *Almanach 1969*; GD ÖBB, *Almanach 1970*; GD ÖBB; *Almanach 1971*; GD ÖBB, *Almanach 1972*; GD ÖBB, *Almanach 1973*; GD ÖBB, *Almanach 1974*; GD ÖBB, *Almanach 1975*; GD ÖBB, *Almanach 1976*; GD ÖBB, *Almanach 1977*; GD ÖBB, *Almanach 1978*; GD ÖBB, *Almanach 1979*; GD ÖBB, *Almanach 1980*; GD ÖBB, *Almanach 1981*; GD ÖBB, *Almanach 1982*; GD ÖBB, *Almanach 1983*; GD ÖBB, *Almanach 1984*; GD ÖBB, *Almanach 1985*; GD ÖBB, *Almanach 1986*; GD ÖBB, *Almanach 1987*.

86 Jahrbacher, Interview with Ferdinand; Interview with Emil; Interview with Franz and Josef. Teil 1; Interview with Franz and Josef. Teil 2. See also Heßler, "Technikemotionen," 3–8.

program reduced a full-time job to a two-day task, illustrating the efficiency gains of automation – "with the push of a button."[87] Others, however, voiced unease about the increasing complexity of administrative processes and a perceived loss of control over decision-making.[88] It is important to note that these interviews, conducted in 2023, reflect retrospective interpretations rather than real-time emotional reactions. Reported feelings of ambivalence, pragmatism, or uncertainty should be read as meaning-making narratives – shaped by hindsight, selective memory, and contemporary frames of reference.

Employee reactions ranged from "tech enthusiasm" to "tech anxiety."[89] Enthusiasts viewed automation as a chance to improve efficiency and take on more meaningful tasks. Skeptics, in contrast, feared job displacement and the erosion of valued skills. The rapid pace of digitalization added to the uncertainty.[90] However, these patterns should not be understood as fixed typologies. Several interviewees expressed both enthusiasm and concern – sometimes even within the same narrative. Rather than dividing neatly into "enthusiasts" and "skeptics," most accounts reflected a fluid mix of adaptation, pragmatism, and uncertainty, shaped by changing roles, institutional cultures, and personal trajectories.

These emotional responses, as revealed through interviews with former ÖBB employees, were shaped not only by individual perceptions but also by broader societal expectations and organizational cultures surrounding work and technology. Long-standing routines within the company intersected with generational differences in attitudes toward digitalization, producing a complex emotional landscape.[91] Established employees, accustomed to traditional workflows, often expressed skepticism about new technologies, viewing them as disruptive to familiar practices. In contrast, younger staff tended to be more open to innovation and embraced new systems as tools of increasing efficiency and enabling progress. This emotional spectrum significantly influenced how digitalization was received and implemented at ÖBB. Enthusiasm for technology fostered openness to change and empowered early adopters to champion modernization, whereas technology-related anxiety posed barriers to adoption and slowed integration.[92] Concerns

87 Jahrbacher, Interview with Franz and Josef. Teil 2.

88 Jahrbacher, Interview; Jahrbacher, Interview with Franz and Josef. Teil 1. See also Turek, "Planungs- und Realisierungsstand 1975"; Zeiller, "Das Personal-Informations-System der ÖBB"; Zelenka, "EDV-Projekt."

89 Heßler and Hitzer, "Introduction"; Heßler, "Technikemotionen," 2–8.

90 Heßler, "Technikemotionen," 2. See also Jahrbacher, Interview with Emil.

91 Heßler, "Technikemotionen," 25.

92 Heßler; Heßler and Hitzer, "Introduction"; Winker, *Büro. Computer. Geschlechterhierarchie*.

about job security, in particular, contributed to hesitation in fully embracing automation.[93]

Recognizing these challenges, ÖBB introduced training programs to familiarize employees with new systems. The company magazine also communicated the benefits of digitalization in a pragmatic, non-threatening tone.[94] While emotional management was not formally institutionalized, it became embedded in these pedagogical and communicative strategies – aimed at easing the transition and fostering a sense of inclusion in the modernization process.[95]

The following case studies from oral history interviews further illustrate the emotional diversity described above. These first-hand accounts illuminate how ÖBB staff navigated the shift from manual processes to digital systems – revealing their concerns, adaptations, and reflections on job security, satisfaction, and professional development within a changing institutional framework. Rather than sorting into clear-cut categories, some interviewees tended to shift between skepticism and engagement, depending on their institutional role, career stage, or the task at hand.

Emil began his career at ÖBB in 1978 as an "Amtsgehilfe" (administrative assistant) in the "Zentrale Personalstelle" (Central Personnel Office) of the General Directorate. His early tasks were largely manual and routine, including the distribution of internal mail and official documents. Demonstrating dedication and ambition, he took evening courses and passed the "Kanzlistenprüfung" (clerk exam), which allowed him to transition into more complex administrative responsibilities. Over the course of his career, he witnessed and experienced significant technological and structural changes that profoundly shaped his working life and emotional relationship with the organization.[96]

In the late 1980s and 1990s, ÖBB began implementing significant technological changes. Emil was directly affected – particularly by the introduction of computers and the transition from manual to electronic data processing. Although his status as a tenured civil servant formally ensured job security, regular pay increases, and a predictable career path, he nonetheless expressed growing unease. As automation

93 Jahrbacher, Interview with Emil; Interview with Ferdinand; Interview with Franz and Josef. Teil 1; Interview with Franz and Josef. Teil 2.

94 See ÖBB employee publications such as "ÖBB-Journal," "Der Betrieb,"and "Die ÖBB in Wort und Bild," and ÖBB "Verkehrs-Unterrichtsblatt" for contemporary discussions of technological change and internal communication strategies. See, e.g., Turek, "Planungs- und Realisierungsstand"; Zeiller, "Das Personal-Informations-System."

95 See the ÖBB employee newspapers (1970s–1980s) for discussions on workforce concerns about automation and resistance to digitalization. Oral history interviews (Jahrbacher, 2023) highlight employee anxieties regarding job security and skill adaptation.

96 Jahrbacher, Interview with Emil.

advanced, he began to question the long-term relevance of his role and felt increasingly uncertain about how his existing skills would align with emerging expectations. At the same time, Emil expressed a deep-seated loyalty to the ÖBB.[97] This tension between formal security and emotional insecurity emerged as a recurring theme in interviews with long-serving employees. While institutional protections shielded workers like Emil from the immediate economic consequences of restructuring, they offered little defense against the psychological strain of rapid technological change. His case illustrates how digital transformation could unsettle professional identity – even in the relative safety of the public sector.

In contrast, interviewee Josef experienced technological change as a welcome challenge and a chance for professional growth. He actively participated in training programs to learn the new systems – first the Nixdorf computers, later SAP software – and found the process both demanding and intellectually stimulating. As noted earlier, he developed an Excel program that cut a full-time task to two days, demonstrating how digital tools can boost efficiency and morale even as some colleagues perceived such gains as a threat to job security.[98]

Another example of adaptive behavior emerged in technical departments, where engineers and construction specialists increasingly assumed documentation tasks once delegated to clerical staff. As digital systems became more widespread, traditional role boundaries blurred, and employees were expected to acquire new technical competencies. This shift not only redefined workflows but also reshaped everyday work identities.[99]

Conversely, another interviewee offered a more nuanced perspective on job satisfaction and motivation. While job security was not explicitly addressed, the interviewee emphasized the excitement and fulfillment derived from engaging in innovative and challenging projects. Collaboration with national and international partners fostered a sense of pride and purpose, contributing to a generally positive emotional climate within the organization. Although concerns about job security were absent, the overall tone of the interview conveyed a strong sense of motivation rooted in the meaningful nature of work. This underscores the multifaceted character of employee emotions – where enthusiasm and professional fulfillment could, in some cases, outweigh latent insecurities.[100] Given that the interviews are male-skewed, they provide an incomplete picture. Contemporary documentation, including the 1985 Women's Report, indicates that women encountered a dual burden – loss of clerical tasks through automation and pressure to acquire technical

97 Jahrbacher, Interview with Emil.

98 Jahrbacher, Interview with Franz and Josef. Teil 2,

99 Jahrbacher, Interview with Emil.

100 Jahrbacher, Interview with Ferdinand; Jahrbacher, Interview with Emil.

competencies in male-dominated settings – highlighting the risk that digitization reproduced existing inequalities.[101]

One interview conversation about the historical evolution of HR systems at ÖBB offered valuable insight into the emotional dimensions of organizational change. The transition from customized mainframe systems to standardized SAP solutions marked not just a technical upgrade, but a broader cultural shift for the Austrian Federal Railways. While cost-effectiveness and efficiency were the official drivers of this change, employees recalled a range of emotional reactions. Concerns about job security reflected wider anxieties about the future of work in an increasingly digital environment. At the same time, many also expressed enthusiasm for the challenges and learning opportunities that modernization brought.[102] This emotional duality illustrates the complex interplay between technological change and employee sentiment, underscoring the importance of addressing emotional and gender-related concerns alongside operational goals in transformation processes.

By integrating the analysis of oral history interviews, we gain a more nuanced understanding of how technological change was experienced, interpreted, and negotiated within the Austrian Federal Railways. Employees' reflections on job security, shifting responsibilities, and evolving work environments reveal how digitalization reshaped not only workflows but also perceptions of professional identity and institutional belonging – these narratives reflect broader structural transformations and underscore the human dimension of organizational change. Viewed through the lens of innovation studies, the emotional responses observed during ÖBB's digital transition align with Joseph Schumpeter's concept of "creative destruction," which captures the disruptive nature of technological progress as innovation dismantles established routines and social structures, producing resistance and instability[103] – a dynamic evident in the experiences of employees like Emil, who expressed anxiety over the potential obsolescence of their skills. Likewise, Clayton Christensen's theory of the "Innovator's Dilemma" offers further context: established organizations often struggle to adapt to disruptive innovations because deeply rooted structures and mental models resist change;[104] in ÖBB's case, resistance to computerization stemmed in part from a bureaucratic culture built around hierarchical authority and manual processes.[105]

101 Cyba et al., "Heft 3," 53–57, 92–95; Feigl, "Heft 8," 16–19, 112.

102 Jahrbacher, Interview with Franz and Josef. Teil 1, Teil 2.

103 Schumpeter, "The Instability of Capitalism"; Schumpeter and Esslinger, "Entwicklung."

104 Christensen et al., "Disruptive Innovation"; Christensen, *The Ongoing Process*; Christensen, *Innovator's Dilemma*.

105 Republik Österreich, *Bericht des Rechnungshofes*, 6–10 (Abs. 20.1, 21.1, 21.2, 23.1.1, 23.1.4, 23.1.5, 23.2.1).

The introduction of computerization at ÖBB exemplifies the emotional complexity of technological transformation. While digital tools brought benefits in terms of efficiency and productivity, they also disrupted long-standing work routines and provoked widespread anxieties about job security. The contrasting experiences of employees like Emil and Josef underscore the subjective nature of these responses, as captured in oral history interviews. Their differing reactions were shaped by individuals' job roles, career paths, and institutional positioning – reflecting broader patterns of adaptation, ambivalence, and resistance within the workforce.

## Conclusions

This chapter has examined the multifaceted transformation of the Austrian Federal Railways (ÖBB) between 1969 and 1991, focusing on how computerization – the rollout of EDP (EDV) and office IT systems – reshaped administrative practices, organizational structures, gender relations, and emotional experiences. Far from a purely technical or efficiency-driven process, the introduction of computer-based systems intersected with deeply rooted institutional routines and hierarchies. The case shows how technological change unfolds within historically embedded frameworks of labor, power, and identity.

ÖBB's computerization and the associated organizational digitalization formed part of broader moves toward market-oriented public sector digitalization and modernization, propelled by global economic pressures, European integration, and emerging digital standards. Management framed computerization as a rational strategy to improve transparency, reduce costs, and align with contemporary norms of performance and accountability. In practice, however, digitalization proceeded unevenly and generated tensions: organizational change often outpaced institutional adaptation, producing friction and ambivalence among employees asked to renegotiate roles and expectations.

A closer examination underscores the persistence of gendered labor structures within ÖBB's IT domains over nearly two decades. Technical EDP work remained male-dominated throughout the 1970s and 1980s, as indicated by personnel records and departmental hierarchies; women were concentrated in supportive and clerical roles, meaning computerization reinforced rather than challenged traditional gender allocations; and the expansion of IT systems did not translate into greater female representation at higher levels – indeed, in some cases restructuring linked to digitalization consolidated existing hierarchies, confining women to lower and middle ranks of the evolving organizational framework.

Emotional responses further reveal the affective dimension of organizational change. Oral histories register a wide spectrum – shaped by institutional culture, generational identity, and professional positioning. While younger or technically

engaged employees often welcomed computerization as a pathway to autonomy and strategic engagement, more senior staff – especially those in clerical or administrative roles – expressed uncertainty about future prospects, the value of their skills, and the loss of familiar routines.

These dynamics complicate dominant theories of innovation. Schumpeter's "creative destruction" and Christensen's "Innovator's Dilemma" illuminate why technological change destabilizes established systems, yet the ÖBB case demonstrates the limits of these models in accounting for persistent institutional cultures, social hierarchies, and emotional ambivalence. Computerization introduced disruption – but digitalization also stabilized or reinforced long-standing inequalities. In this context, innovation was as much about continuity as transformation.

Ultimately, computerization (EDP and automation efforts) at ÖBB reflects a characteristic pattern of late-twentieth-century public sector modernization: a drive toward efficiency and digital integration that coexisted with unresolved structural inequalities and the emotional weight of institutional change. Computer-based systems enabled workflow automation and supported the organization's digitalization through standardization and more centralized decision-making, yet they also reinscribed gendered divisions of labor and produced pervasive uncertainty. Modernization thus unfolded not as a clean break with the past, but as a layered and ambivalent process – combining innovation with institutional inertia, empowerment with marginalization, and hope with disorientation.

This analysis underscores the value of integrating social, emotional, and gendered perspectives into the study of technological change. Attending to how employees experienced, interpreted, and navigated computerization and digitalization clarifies not only institutional outcomes but also the human costs and contradictions of modernization. As public institutions continue to pursue digital strategies, the ÖBB case is a reminder that technological progress is never purely technical – it is always social, emotional, and political.

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