

Euphoria, frustration, and shame: Emotional resonance in the digitization of work (1970s to 1990s) using SAP as an example

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Introduction

In the world of work emotions are of great importance for the motivation, the quality, and the success of work. As a basic condition of human existence, work is part of Arendt's "vita activa" and as such fundamentally associated with emotions.¹ In the context of digital technology, work, technology, and emotions form a triad of mutually influential factors of human existence. This chapter shows examples of emotions such as euphoria or frustration that arise when using digital technology at work. It examines the impact of how these emotions influence the development of technology and how they change. The question of emotional relevance is examined using the example of SAP technology in West German and Austrian companies in the phase of its initial use in the early 1970s and in the phase of its widespread use a decade later and beyond, based on sources from company archives, oral history interviews, personal documents, specialized press reports, and two scientific studies on SAP, the AFOS and WSO study.²

1 Arendt, *Vita activa*, 187.

2 German quotations were translated by me. The AFOS study refers to the scientific project "Gestaltungsmöglichkeiten integrierter Standardsoftware am Beispiel der Softwareprodukte R/2 und R/3 von SAP" (Design options for integrated standard software using the example of SAP's R/2 and R/3 software products), which was conducted with fifty companies from 1991 to 1995. The results were published in Barthel and Blume, *SAP, Arbeit, Management*. The WSO study was carried out by Wicke-Schwitalla-Organization, a financially independent, interdisciplinary consulting and research institute in Dortmund, Germany under the title "Introduction and Application of SAP in Transport and Utility Companies" (1993 to 1995) with funding from the Hans Böckler Foundation and the ÖTV trade union. The results were published in Wicke, *SAP-Einsatz*.

SAP as a driving force and a force driven³

In 1972, in the wake of the so-called software crisis and the unbundling of hardware and software with the commercial revaluation of software, five ambitious former IBM employees founded the software company SAP with the vision of developing standard software for business applications such as financial accounting, human resources, materials management, and controlling. Previously heterogeneous, often individual solutions for data processing were to be standardized, integrated into a uniform system, and processed in real time, which was then a novelty.

The company's founding was followed by continuous and rapid growth on a global scale.⁴ SAP was a mass phenomenon and had achieved the status of a de facto standard for large and medium-sized companies by the mid-1990s at the latest.⁵ At the end of the period under review, "an estimated 1.5 million employees worldwide used [SAP's software product] R/3" which led the renowned computer historian Martin Campbell-Kelly to compare SAP with major US computer companies, stating that SAP is "as much a part of the fabric of global business today as IBM was in the 1980s."⁶ He even underscored SAP's importance by pointing out the degree of dependence of the market:

If overnight R/3 were to cease to exist (say, if its licenses were made intolerably expensive), the industrial economy of the Western world would come to a halt, and it would take years for substitutes to close the breach in the networked economy. Were Microsoft's products to vaporize overnight, it would take only days or weeks to find substitutes, and the economic disruption would be modest.⁷

Another computer historian, James Cortada, analyzed SAP's global spread and found path dependency as well as the implementation of standardized business processes as "the SAP way," to be a major reason for the diffusion.⁸ In addition to focusing on standardization and early internationalization, other factors contributing to success included a user-oriented development strategy, whereby user requirements and experiences were consistently and recursively integrated into product development. This also allowed for affective features in the design of the software, especially at the end of the 1990s.

3 Leimbach, "Treibende Kraft," 190.

4 SAP has around 400,000 companies as customers and 300 million cloud users worldwide: <https://www.sap.com/germany/about/company/history.html>.

5 Mormann, *Das Projekt SAP*, 78.

6 Campbell-Kelly, *From Airline Reservations*, 166.

7 Campbell-Kelly, 197.

8 Cortada, *How Societies Embrace Information*, 57–58.

In its more than 50-year history, SAP has established itself as a global player. Its standard software generations for business applications, R/2, R/3, and cloud-based solutions reflect the most important technological development trends in the history of software, from punched cards to cloud computing. Often described as disruptive and a driving force, it has profoundly transformed the business world, work, and the working practices of millions of end users in offices, companies, and on a global scale.⁹ The latter makes SAP particularly interesting for research into questions of the history of technology, as demonstrated for example by the computer historians cited, without the topic being anywhere near exhausted, especially regarding a critical reflection of common success narratives.

One area of research that has not yet been addressed from a historical perspective is the emotional impact on the workforce using the technology and the resulting consequences. Technologies and emotions are a well-researched interdisciplinary topic in the context of digital human-machine interaction, new forms of emotion-sensitive assistance systems, or in the research of robotics and AI. Both are now also being discussed in many socially relevant dimensions such as “emotional machines”¹⁰ under moral-ethical issues or in the investigation of factors influencing the digital transformation on the perception of workers.¹¹ Historical research started increasingly dealing with emotions and digitalization, as in the form of pandemic-related digital loneliness¹² or, in the context of the “non-human turn,” emotions of non-human animals and machines.¹³ The relevance of emotions is in any case recognized, but their role for historical technology and user research could use more case studies on specific technologies in the workplace and office, as well as on a greater differentiation of emotions. This chapter aims to add an additional perspective and demonstrate the variance of emotions at the same time.

Emotions as practice

Regardless of numerous inter- and intradisciplinary definitions and concepts of emotions research, the understanding of emotions here is founded on the broad consensus of their sociocultural imprint, emphasizing their historicity and changeability over time.¹⁴ The spectrum of emotions discussed under the term “emotional granularity”¹⁵ implies the problem of their differentiation and at the same time

9 Erker and Leimbach, “Von der Ungleichzeitigkeit,” 33.

10 Misselhorn et al., *Emotional Machines*, 9.

11 Guse et al., “Digitale Transformation,” 502nn.

12 Brennan, “Digital Loneliness,” 229nn.

13 Quinn and Janacek, “Introduction,” 4.

14 Verheyen, “Geschichte der Gefühle,” 4.

15 Barrett, *Wie Gefühle entstehen*, 25.

enables flexible designations within semantic word fields with blurred boundaries. If, for example, critical questions arise from the workforce about the purpose of data collection after the introduction of a time tracking system with SAP, where does mistrust end and fear or insecurity begin? Historians with a focus on emotions like to emphasize how emotions motivate human action, set people in motion, paralyze, or direct them. According to Ute Frevert, this is precisely what makes emotions historically powerful.¹⁶

The relation between emotions and actions is also strongly supported by interdisciplinary research, such as by Katharina Scherke with reference to the concept of “energy-generating emotions,” according to which emotional energy influences the course of social situations and can continue even after the situation has long since ended.¹⁷ Emotions connect the past, present, and future by linking events and experiences from the past to a certain emotional state in the present situation, on the basis of which actions are taken (or not taken) that influence the future situation. Emotions can therefore be examined in terms of how they connect the past, present, and future.¹⁸ From a historical perspective, the relation between emotions and actions is reflected in Monique Scheer’s concept of “emotion-as-practice,”¹⁹ which is based on practice theory and integrates emotional aspects into it. According to Scheer, emotions are constituted by a combination of mental attitudes and physical actions, which means that we do not *have* emotions, but *do* them.²⁰ Emotional practices “form complexes of mind/body actions.”²¹ They are “dynamically coupled” to an environment that both influences and is influenced by the unfolding of the emotion.²² On the one hand, emotions motivate practices, and on the other hand, people perform these practices “in order to have emotions.”²³ In short, emotions and practices are highly interdependent and constitute each other in an “emotion/trigger circuit.”²⁴ Her conceptual framework thus takes a holistic and integrative approach that bridges traditional dichotomies such as internal–external or emotional–cognitive in the sense that it is not a question of either/or but of both/and. “*Doing emotion*” means viewing emotions in a performative sense and understanding them as a kind of practice of what is often referred to as “emotional management.”²⁵ According to Scheer, they manifest in categories of mobilizing,

16 Frevert, “Revisiting the History of Emotions,” 12.

17 Scherke, *Emotionssoziologie*, 168–69.

18 Scherke, 126.

19 Scheer, “Emotionspraktiken,” 23, and Scheer, “Are Emotions a Kind of Practice,” 209nn.

20 Scheer, “Emotionspraktiken,” 16.

21 Scheer, “Are Emotions a Kind of Practice,” 209.

22 Scheer, 198.

23 Scheer, 194.

24 Scheer, 206.

25 Scheer, 209.

naming, communicating, and regulating emotional practices.²⁶ Based on this theoretical foundation, this chapter illustrates the mobilizing and regulating emotional practices in the context of SAP.

Mobilizing emotional practices motivate people to take action (e.g., participating in a demonstration out of anger), but are also used to experience moods and emotions (e.g., taking drugs to get high). Mobilization includes both the pursuit of a desired feeling and the alteration of an undesired feeling. Scheer highlights the usage of technologies and media as an extremely important emotional practice, as they can modulate feelings to a greater or lesser extent.²⁷ A cryptic, incomprehensible user interface in SAP can trigger a mobilizing emotional practice by causing users to avoid certain functions and thus reduce the frustration associated with them.

Regulating emotional practices shape emotions within norms and standards of an emotional culture. They demonstrate what is emotionally acceptable and what is not, building a kind of emotional etiquette, as can be seen for example in the deliberate de-emotionalization in the field of science.²⁸ If a user, who has been invited to a demo session as a reference customer, effusively praises the standardization of business processes with SAP software, this can be seen as a regulating emotional practice in Scheer's sense, as he/she corresponds emotionally to expectations of the peer group of SAP.

In what follows, I consider two groups of users of SAP technology: first users as newcomers to the technology in the 1970s with an "experience of discrepancy"²⁹ resulting from the contrast between past and present experiences of technology, and the mass of affected end users of the end-1980s to mid-1990s, who used and operated SAP software as part of their daily work as company employees, clerks, and administrators.³⁰ This chapter argues that different emotional practices developed while encountering the technology, which in turn had a dynamic effect on the technical development as well as on socio-technical and organizational structures. The work looks at two opposing emotional attitudes and aims to illustrate the effects of emotional practices in an exemplary way, without negating other emotional reactions.

Euphoria and enthusiasm of first users

The introduction of real-time processing in West German companies since the early 1970s led to a far-reaching transformation of work. While "real-time" is taken for

26 Scheer, "Emotion als kulturelle Praxis," 357.

27 Scheer, "Are Emotions a Kind of Practice," 209n.

28 Scheer, 215.

29 Reckwitz, *Verlust*, 239.

30 Hohlmann, *Organisation SAP*, 15.

granted today, it was a novelty in everyday work in the 1970s, especially in comparison to mainframe computers and punch-card processing that were common at the time. For the first users of SAP, two factors provided the emotional framework: the novelty of a still immature technology and their own inexperience. They are the starting point for the analysis, analogous to the “first encounters”³¹ in Sherry Turkle’s study of the introduction of home computers and computer games, according to which the reactions are most pronounced among the newcomers to a technology.³² To understand the emotional reactions to the new SAP technology, I conducted interviews with former employees of companies that were the first to implement the technology along with various reports on the introduction of SAP.³³

Although business processes had already been automated, rationalized, and fundamentally changed in the 1960s from manual to electronic punched-card-based data processing,³⁴ processing remained time-consuming, paper-based, and an assembly-line-like batch operation³⁵ with “lengthy tasks.”³⁶ In contrast, real-time processing established a new kind of data processing in dialog mode on the screen: several clerks could each access a data record individually, edit it simultaneously, directly and interactively, and take turns with the system in time-sharing mode. With the first SAP R/1³⁷ product to be introduced to the West German market, SAP positioned the “real-time working method”³⁸ as an innovation, thereby also introducing new working and time practices such as reaction and response times. The localization of the new device on a user’s desk established the potential to develop an individual and emotional relationship between user and computer because the physical proximity also had an impact on the psychological context, enabling an emotional relationship with it.³⁹ Turkle proved this as early as the late 1970s in her research on computer use by children and young people. Typing not only triggered a very sensual feeling, but people formed a personal relationship with the computer.⁴⁰

31 Turkle, *Alone Together*, 86.

32 Turkle, *Die Wunschmaschine*, 406.

33 Oral history interviews with former employees of three SAP customer companies conducted as part of a dissertation project, 2021–2023: Imperial Chemical Industries ICI (taken over by Akzo Nobel in 2007), a German publishing house, and Nettingsdorfer Papierfabrik, Austria (since 2000 Kappa Smurfit).

34 Fuhrmann, “Veränderung der Arbeitsaufgaben,” 330nn.

35 Hellige, *Paradigmenwechsel der Computerbedienung*, 26.

36 Thierry, “Interactivity,” 78.

37 “R” for “real-time.”

38 Zipf, “Der erste Kunde,” 12.

39 Thierry, “Interactivity,” 79.

40 Turkle, *Die Wunschmaschine*, 152.

ICI Fibres⁴¹ was the first company to use SAP technology productively from 1971 during SAP's exploration phase and even before it was officially founded. From the founders' perspective, ICI's initial impact was a stroke of luck for the start-up.⁴² The changes in work practices are illustrated by a before-and-after comparison of an ordering process at ICI: while the manual ordering process in purchasing had taken several days, passing through many hands, with handwritten notes,⁴³ the digitized process based on the SAP real-time system was synchronized immediately and with up-to-date data by a single purchaser.⁴⁴ In retrospect, the generation and provision of up-to-date, new, non-prestructured information with a stroke on a keyboard seemed to make an impressive difference from the point of view of the first users. Instead of laborious and error-prone manual work, a simple keystroke allowed staff to extract and evaluate data with aggregated information, for example on material bottlenecks, orders, or capacity utilization. For clerks and administrative staff alike, the availability of up-to-date, consistent, and consolidated data meant the end of tedious data collection, searching, sorting, and correcting printed or written lists. A user at the publishing house describes this difference vividly:

"While, for example, the stock lists used to become obsolete within a very short time, were just rubble and ashes and no longer up to date and were no longer looked at after three days, after the introduction of SAP the data was updated daily via integrated applications and everyone was able to satisfy their information needs. ... in view of the previous manual work with lists of, for example, 28,000 article items ... we have become much, much better, cleaner and more transparent in terms of data quality. There were no more backlogs.⁴⁵

The ease of the keystroke (and even more the mouse click in the 1980s) in relation to the data and information obtained becomes comparable to the "magical gesture" of pressing a button, which Zimmer addresses in the control of hydropower, showing how pressing a knob became an everyday gesture while retaining a magical quality because it allowed nature to be controlled.⁴⁶ Like the gentle pressing of a button, the stroke of a key in the SAP system had a magical effect and even retains this positive charge to this day, when SAP still advertises its ability to generate information "at

41 Imperial Chemical Industries (ICI), Fibres Division was a British pharmaceutical company with a German subsidiary in southwest of Germany and the first company to implement SAP software.

42 Zipf, "Der erste Kunde," 10.

43 Siegele and Zepelin, *Matrix der Welt*, 39–40.

44 Zipf, "Der erste Kunde," 14.

45 OH KS, 4, 3, 10.

46 Zimmer, *Hydroelektrische Projektionen*, 157.

your fingertips.”⁴⁷ Depending on the role within a company, the magic stroke either led to joy at the time saved in manually searching for, collecting, and sorting paper or to enthusiasm at the generation of business-relevant data. A whiff of David Nye’s “technological sublime”⁴⁸ resonates in statements when a first report in the *Computerwoche* in 1976 about the use of SAP at ICI states: “Some shake their heads” as an “average response time of 0.7 seconds ... is hard for anyone to believe.”⁴⁹ Following Nye, the hint of sublimity evident in these statements “is, by definition, something one is not accustomed to, something extraordinary” and at the same time an experience that creates a stronger sense of community among those who share it.⁵⁰ In interviews, those involved in the implementation speak enthusiastically of a “quantum leap,”⁵¹ or even of a “big bang” that had never been seen before.⁵² The immediate provision of operational and business data in real-time and at the stroke of a key was a categorically new dimension of data processing and triggered strong emotions.

The dialog mode using a keyboard and screen with natural language elements for input fields, error messages, and online help was another novelty in interacting with the system and affected working practices.⁵³ The ICI MIAS operating manual of 1972, one of the earliest documents on dialog processing of business applications with SAP in Germany, explains dialog mode as a sequence of screens that were run through and posted at the end of a business transaction, while simple natural language system messages instructed the user on how to use masks, enter data, or correct errors.⁵⁴ Despite extremely limited linguistic means, the system mastered an impressive repertoire of activities when processing transactions: it answered and provided hints, checked for correctness and consistency, reported mistakes via error messages, or offered a sense of achievement when confirming successful postings. Interactive mode fundamentally changed the way people interacted with computers, as one popular science publication hyperbolically commented: “SAP’s real-time software made it possible for the first time to communicate directly with the computer.”⁵⁵ The first users, mostly male, shared similar experiences and emotions in relation to new working practices with SAP. The introduction of the software brought

47 <https://news.sap.com/india/2021/06/saps-new-mobile-experience-the-intelligent-enterprise-at-your-fingertips/>.

48 Nye, *American Technological Sublime*, 23.

49 <https://www.computerwoche.de/a/ici-europa-fibres-gmbh-oestringen,1201954>.

50 Nye, *American Technological Sublime*, 23.

51 OH KS, 30.

52 OH WR, 4.

53 MIAS Material-, Informations- und Abrechnungssystem, Betriebsanleitung [Material, information, and billing system, operating manual] V3, chap. 2.2, 10.

54 MIAS Material, chap. 2.3, 3nn.

55 Meissner, *SAP*, 36.

seemingly undeniable advantages for daily workflows, followed by joy and enthusiasm, which the interviewee from the publishing house summarized: “Yes, we were really proud and happy.”⁵⁶

The highly consistent tenor of the interviewees requires critical reflection: Memories are subjectively constructed and tend toward a “nostalgia effect,”⁵⁷ as the interviewee from the Nettingsdorfer Papierfabrik, one of the first companies in Austria using SAP, self-critically admitted: “in retrospect, everything is always glorified.”⁵⁸ Statements may be exaggerated in tendentious company publications, when hindsight makes the quantum leap appear even greater or problems, uncertainties, annoyance, and doubts about the introduction of SAP had long been forgotten. When evaluating the statements, “nostalgia as a filter in retrospect” must therefore be considered as a critical component to relativize, for example, euphorically glorified exaggerations.⁵⁹ Stories and interpretations usually reflect the current state of knowledge of the interviewees and are overlaid and shaped by the experiences they may have made in the meantime. Thus, a technological innovation such as the introduction of real time is recounted differently in retrospect and in the knowledge of its later successful implementation than it was in the formerly contingent initial situation. Skepticism that was eventually latent at the time may have turned into euphoria as the “real” story only emerges after a certain period and then may take on a completely different form than it appeared to the respective contemporaries.⁶⁰

Despite this critical assessment, the interviews with former employees from different organizations and positions are clearly positive in their emotional expressiveness, are generally not purely fictional or even fictitious, and may be described as “reality narratives.”⁶¹ The subjectivity of the interviews includes emotions of the interviewees and allows them to be considered as a kind of subjective reality narrative. Overall, the effects of the switch to the new SAP technology are remembered very positively in this early phase of use and are described in a euphoric manner when, for example, one of the few female interviewee at ICI looks back, mentioning the elimination of tedious corrections: “We were all very excited to be able to work with such a great system.”⁶² Employee magazines such as the ICI-Faserspiegel support the findings from the company’s perspective, for example when a 1971 issue reports that a level has been reached that not only satisfied everyone involved, but also filled them with a little pride.⁶³

56 OH KS, 11.

57 Niethammer, “Fragen – Antworten – Frage”, 425.

58 OH PB, 1.

59 Niethammer, “Fragen – Antworten – Fragen”, 397.

60 Koselleck, *Vergangene Zukunft*, 311.

61 Althaus and Apel, “Oral History”, 1.

62 OH JG, 3.

63 N.N., ICI Faserspiegel, 10/1971.

Emotional community of the “SAP family”

In the 1970s and early 1980s, the main actors on the software provider side included the founders of SAP themselves and an initially small number of developers.⁶⁴ On the side of SAP’s customer companies that were the first to implement the new technology,⁶⁵ the main players at that time included single employees and individuals who often worked closely with the software provider in a managerial role, such as in IT departments in the middle management. These key individuals acted as intermediaries between the software company and their own top management and were essential for the communication and acceptance of the technology in these companies. Comparable to elevator boys, they conveyed a sense of security and were valuable figures who helped people to emotionally trust the new technology.⁶⁶ These actors formed an informal, cross-company group of technophile, similarly aged men and enthusiasts with the common goal of developing and implementing an integrated, dialog-based business application software. As pioneers of technology, they formed a male community of interest within the framework of stereotypical gender roles, the size of which can be measured by the formation of two teams for their regular joint football matches. According to one of the ICI interviewees, it was a “sworn community” in which a “we-feeling,” the “family,” and the “familiar” prevailed: “It was all so familiar and everyone trusted everyone.”⁶⁷ The group outlined in this way is defined in the sense of the medievalist Rosenwein as an “emotional community”⁶⁸ with a common emotional system, according to which emotions are considered a function of community: “People lived – and live – in what I propose to call ‘emotional communities’. These are precisely the same as social communities – families, neighborhoods, parliaments, guilds, monasteries, parish church memberships.”⁶⁹ According to Rosenwein, the members of a social group share goals and interests, forming an “emotional community” that defines and evaluates which emotions in which form of expression are expected or rejected. Referring to Scheer’s concept, regulating emotional practices come into effect within an emotional community. In the case of SAP the emotional attachment among early users based on shared enthusiasm regarding the new technology qualified them as a “family” from the point of

64 Meissner, SAP, 283n. Number of SAP employees end of 1972: nine employees incl. founders; 1976: 75 employees; 1984: 163 employees.

65 The first ten SAP customer companies in Germany: 1. Imperial Chemical Industries ICI, 2. Knoll Pharma, 3. Thermal, 4. Reemtsma Rothähndle, 5. Burda-Verlag, 6. Linde, 7. Grünzweig & Hartmann AG, 8. Schott AG, 9. Boehringer Mannheim, 10. Schulze Pharma (s. 50 years – *Geschichte, Wirkung und Zukunft der SAP*, edited by SAP-Unternehmenskommunikation, 140nn.).

66 Payer, “Müheles nach oben,” 146.

67 OH RK, 10.

68 Rosenwein, “Worrying about Emotions,” 842.

69 Rosenwein.

view of those involved, and as the interviewee from the publishing house succinctly put it: “SAP was like a family back then.”⁷⁰ The sense of “family” is also used to refer to one of the company founders as “Father Hopp.”⁷¹

Summarizing these findings, the emotional community is introduced as the “SAP family”, whose members identified themselves by configuring, sharing and evaluating dominant emotions in relation to the appraisal of propagated technological progress while referring to family-felt emotions. Coming back to Scherke’s work on the social function of emotions, she states that they can have unifying functions (and divisive ones also) by supporting cohesion within one’s own group. Loyalty and gratitude are examples of the unifying function of emotions.⁷² Against this background, the emotional community of the “SAP family” provides a striking example of the socially unifying function of emotions. In Nye’s view, shared enthusiasm helped individuals to see themselves as members of a larger community.⁷³ The common cliché of the so-called ideal family promises a community of equal, caring members, which, in the case of the “SAP family,” conveyed noble values of an ideal while at the same time concealing the economic interests of those involved. Using IBM in the 1950s as an example, Schlombs showed comparable discrepancies when family rhetoric, in combination with monetary allowances and benefits for employees, was used to prevent the workforce from showing solidarity with trade unions.⁷⁴ The emotional community of the “SAP family” encouraged behavior that affected the technology and its wider distribution. Regular activities established “mobilizing” emotional practices in Scheer’s sense. Collaboration, cooperation, and co-innovation thus enhanced positive emotions of the community and in the interest of the software vendor.

Collaboration with the common goal of developing an integrated and standardized software solution manifested itself, such as joint training sessions, live demos, and jointly conducted sales events for prospective SAP customers.⁷⁵ Interviewees from SAP customer companies report how they conducted demos and presentations for prospects of the software house with their own employer’s consent.⁷⁶ The first SAP software versions were developed on computers of companies such as ICI, because the software provider did not have its own equipment at that time.⁷⁷ Likewise, premises and infrastructure were provided to SAP free of charge or employees were

70 OH KS, 13.

71 Zipf, “Eine verschworene Gemeinschaft,” 182nn.

72 Scherke, *Emotionssoziologie*, 140.

73 Nye, *American Technological Sublime*, 35.

74 Schlombs, “Gender is a Corporate Tool,” 161.

75 N.N., “Die einjährige Probezeit bestanden: Knoll-Buchhaltung per Bildschirm,” *Knoll Informationen*, 04/1974, 17.

76 OH GO, 3.

77 Rothermel, “Die ICI und die Geburt der SAP,” 46–48.

assigned to support development. Employees were “borrowed” and “passed around,” as one interviewee from ICI reports: “I was passed around with this product at various congresses and events and then sang the praises of the standard software and argued against in-house development.”⁷⁸ Interviews report that employees were allegedly sent to help out and were deployed on such a scale that it was often no longer possible to tell who belonged to which company, because, according to one interviewee, “of course they sang the praises of SAP with great enthusiasm.”⁷⁹ With the “song of praise” that this “passed-around” interviewee sang “with great enthusiasm,” he demonstrates a regulating emotional practice, as he expresses emotions in accordance with the expectation that is set as norm in the context of such events. He displays an ironic attitude and thus an effect that Arlie Hochschild discusses in her studies on emotional labor, according to which there is often a discrepancy between the actual feelings of those affected and the emotional representations required of them in their daily work.⁸⁰ While the members of the “SAP family” acted as if they belonged to one and the same company, it remains unclear to what extent all those affected authentically shared this mood.

For the further development of the system into an industry standard product, it was crucial that business knowledge was shared and exchanged as freely as possible, as the example of the fiscal year change function shows:⁸¹ Its design and realization resulted from the joint efforts and development of employees of the publishing house and SAP developers, based on the operational experience of the publishing house and the technical expertise of the software provider.⁸² As one of the SAP founders explained, “first-hand information” was crucial for the development of the integrated functions, because the knowledge gained from users’ live operations would fly back immediately and could be used directly for new concepts and further developments of the products.⁸³ Close collaboration was a key prerequisite for identifying business process patterns and developing standard software.

Frustration, suspicion, and shame on the part of the end users

With the increasing spread of SAP in the 1980s, more and more people encountered the software as end users in their companies, while the emotional community of the first users began to dissolve or formed other structures, such as official user

78 OH RK, 6.

79 OH RK.

80 Hochschild, “Das gekaufte Herz,” 299.

81 Leimbach, “Mehr als die Summe seiner Teile,” 93.

82 OH KS, 12n.

83 Hopp, “Beispiele erfolgreicher Unternehmensführung,” 144.

groups.⁸⁴ With increasing visibility and publicity, SAP met criteria that qualified its software as public technology.⁸⁵ At the same time, it became part of the critical discourse on information technology of the time, which led to the software provider engaging with public criticism.⁸⁶ New actors stood for a different, controversial perception of the technology, attributing risks and dangers to those who worked with it as “human capital.”⁸⁷ Trade unions and works councils began to address the need for protection and vulnerability of end users and to regulate the technically induced changes in work resulting from the introduction of SAP from an employee perspective.⁸⁸

The starting point for emotional reactions were, among other things, technical features, which included real-time processing and the integration of previously separate isolated solutions into a central IT system. Integration brought the company’s business processes together in a unified, central system that all users could use as a “single source of truth.”⁸⁹ Integration replaced the individual solutions of the various business units and made the SAP system the “linchpin” of a software landscape,⁹⁰ the “backbone of IT,”⁹¹ to which all departments of a company were connected. Although the software provider itself had self-critically admitted that this led to increased complexity,⁹² from the end user’s perspective, integration has meant a significant change in working practices. One of the key findings of the WSO study is that complexity is a major cause of the problems in dealing with the system:

SAP is tremendously complex. The immense complexity not only overwhelms SAP and the consultants, but also and especially the operational users. ... The system literally suffocates under its own complexity, even the developers often no longer understand the complexity ... and the users also see themselves confronted with mountains of ballast that they do not need for their respective tasks.⁹³

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- 84 Foundation of official user groups like DSAG in Germany or ASUG in the US end of 1980s and throughout the 1990s and beyond worldwide.
 - 85 Trischler and Bud, “Öffentliche Technik,” 4nn.
 - 86 Tschira, Korrespondenz mit der OETV, 1988.
 - 87 Tschira, “Zurück auf den Boden und vorwärts!,” May 1993, 1.
 - 88 The labor-related magazine *Computerinformation für Personal- und Betriebsräte* began reporting on SAP in 1992.
 - 89 Siegele and Zepelin, *Matrix der Welt*, 53.
 - 90 N.N., SAP als bewährte, neue Basis. Einführung fördert Zusammenarbeit der Bereiche. *ARBURG allrounder* 36, 2008, 7.
 - 91 N.N., Für die Zukunft gerüstet. ARBURG: Mit Umstellung auf SAP optimal aufgestellt. *heute* 61/2016, 16 and 24.
 - 92 Tschira, Produktstrategie der SAP, 1988, 5.
 - 93 Wicke, *SAP-Einsatz* (WSO study), 18nn.

Users complained that “SAP software is not self-explanatory ... for beginners, the dialog messages and help texts contribute more to confusion than to information.”⁹⁴ Complexity and user-unfriendliness of the SAP software became a standard narrative of the press.⁹⁵ These manifested for end users in the user-unfriendly interface of a monochrome monitor⁹⁶ with text-oriented display in strong light–dark contrasts, cryptic field names, and sometimes incorrect assignments of data field names and data to be entered.⁹⁷ Complexity was evident in the display of many unrelated and unnecessary fields on a screen or mask, or conversely in the separation of business-relevant data complexes on different masks.⁹⁸ By dividing up tasks, the program seemed to promote a Tayloristic way of working and at the same time dictate to people at their screens how to do their work.⁹⁹ Online help and documentation were further examples of user-unfriendliness, as they were only available in a rudimentary form, if at all, and hardly did justice to the title “help.” According to SAP founder Klaus Tschira, this poor design led the end user to ineptitude when searching for suitable documentation. The end user repeated or read superfluous information, scrolled through irrelevant displays and wandered aimlessly through menus or command formats.¹⁰⁰ Overall, there was no discussion of user-oriented software at the time; end users had to learn to “get along” with it.¹⁰¹ Complexity created a tension between the “local” simplicity of the individual actions that make up a program and the “global” complexity that arose when working with the program, in Sherry Turkle’s framing.¹⁰²

Integration meant a lack of transparency, as the individual user who entered data into one application may not have been aware of the impact that data could have on another integrated application. In addition to their own tasks, end users always performed data entry for other departments, with usage that remained unclear to the individual.¹⁰³ The WSO study also cited this deficiency as a result when end users of the complex integrated SAP system often could not even see the consequences of their own work for other areas of responsibility and speak of a “very fundamental problem of SAP from the point of view of error robustness.”¹⁰⁴ According to the AFOS study, missing or incorrect data in the integrated system could not

94 Baumann and Haucke, “SAP-Software schulungsbedürftig,” 64.

95 Schneider, “Bei Software-User:n.”

96 IBM 2260, 12x80 characters, (1974: IBM 3270, 24x80 characters).

97 Barthel and Blume, *SAP, Arbeit, Management* (AFOS study), 160n.

98 Barthel and Blume, 160.

99 Schröter, “Vom Bediener zum Computeruser.”

100 Tschira, *Integration, Intelligenz, Komplexität*, 1989, 2.

101 Leimbach, “Treibende Kraft,” 193.

102 Turkle, *Die Wunschmaschine*, 337.

103 Barthel and Blume, *SAP, Arbeit, Management* (AFOS study), 17.

104 Wicke, *SAP-Einsatz* (WSO study), 128–29.

only hinder one's own work, but also caused "social pressure from frustrated fellow users."¹⁰⁵ Complexity, the AFOS study continued, placed higher demands on data discipline and at the same time increased the potential for errors. According to the study, entering a purchase order, for example, affected all integrated applications at the same time and required constant concentration and attention due to higher data quality and data discipline requirements.¹⁰⁶ The overall effect of the recorded data remained largely unmanageable and meant a significant change: whereas the work area had previously remained within the department and thus under the control of the clerk, the scope of data maintenance as a whole now knew no bounds.

According to the studies, complexity was a central reason for frustration in dealing with SAP technology, but it also occurred in connection with operational change processes in the context of change management,¹⁰⁷ as was common when SAP was implemented. In the context of technology, frustration at work is a well-known phenomenon in research: for example, the empirical error analysis by Michael Frese and Dieter Zapf on working with computers at the beginning of the 1990s showed already that the time needed to correct errors could cause negative emotions such as anger, frustration, and tension.¹⁰⁸ Joseph Corn discusses frustration as a reaction to the user-unfriendliness of digital functions, such as a heating thermostat with timers and incomprehensible messages.¹⁰⁹ Shoshana Zuboff cites frustration as a reaction to the devaluation of technical or other experiential knowledge¹¹⁰ and Quinn and Janacek have pointed to possible negative emotional consequences such as frustration, loneliness, or fatigue due to dependence on digital technology during the pandemic.¹¹¹

In the case of SAP, the introduction of the software meant that experienced administrators, employees, and clerks alike were confronted with a new technology and had to deal with the technical inadequacies described. The end users had to cope with poor response times and frequent software-related system failures and shortcomings, which led to frustration and annoyance, as the example of a disgruntled SAP user at the Nettingsdorfer Papierfabrik paper mill in a handwritten letter of complaint in 1989 shows:

For weeks now, we have been severely hampered in our work because some device (printer, screen, system, etc.) is unavailable. We [...] start work at 5:30 in the morning – for nothing. The work piles up until the damage is finally repaired.

105 Barthel and Blume, *SAP, Arbeit, Management* (AFOS study), 21.

106 Barthel and Blume, 17.

107 Schneider, *Frustration*, 39n.

108 Frese, *Fehler bei der Arbeit*, 82.

109 Corn, *User Unfriendliness*, 206.

110 Zuboff, *Age of the Smart Machine*, 132.

111 Quinn and Janacek, "Feeling Beyond the Human," 27.

The truck drivers stand grumbling in the office waiting for various shipping documents. Since we then have to complete the work in the shortest possible time, there are of course no control checks and errors are inevitable. We have the impression that these problems are not being tackled with the necessary urgency. The disgruntled system users are left hoping for improvement.¹¹²

The example vividly describes the frustration of end users when their system goes down, which they are only able to compensate by expending extra work and additional energy. They are expected to absorb the impact of outages and technical failures at their own expense and it is only thanks to their commitment that technical deficiencies are compensated “in the shortest possible time.” In this case, technically caused errors are blamed on people and thus lead to annoyance and frustration.

For reasons of traceability and error analysis, the integrated SAP software required the complete logging of all activities with user ID and time stamp.¹¹³ As a *conditio sine qua non* of system operation, logging simultaneously implied aspects of verifiability and control and entailed an ambivalent interpretation in terms of promises of progress and risks. Integration made it possible to generate new types of performance and behavioral data at a “deeper level of transparency”¹¹⁴ by means of flexible evaluations across integrated applications, and an effect that Zuboff described as “informatization” in her analysis of the “smart machine.” Due to the obvious recording of user activities at the moment they are carried out, on the one hand, and the seemingly clandestine possibilities for evaluating them with access to new types of performance and behavioral data on the other, a fundamental conflict emerged, which was all the more serious given that data protection in Germany was only just beginning to take legal shape.¹¹⁵ Anonymization was not yet an established business practice, and the authorization system was also only rudimentarily in place, if at all.

From the critics’ point of view, a panoptic scenario¹¹⁶ unfolded, in which the mere awareness of being eventually observed at any time could exert pressure on behavior. The end user of an information system became transparent in a new way that, according to Zuboff, could evoke negative feelings of vulnerability and powerlessness. The observed person might begin to wonder if he/she is being exposed in a way he/she doesn’t want to be by asking what it is that they could see?¹¹⁷ The SAP system was no different. Even if it was not the software provider’s intention to control performance or behavior, the awareness of one’s own visibility and controllabil-

112 Letter of complaint from an employee to authorized officer PB of the Nettingsdorfer Papierfabrik, Austria, October 30, 1989 (private archive PB).

113 MIAS operating manual, chap. 2.3, December 1972, 2.

114 Zuboff, *Age of the Smart Machine*, 5.

115 Hessian Data Protection Act in 1970.

116 Zuboff, *Age of the Smart Machine*, 321n.

117 Zuboff, 344.

ity was enough to create a sense of unease and suspicion in the workforce, as the example of the company EKATO¹¹⁸ shows: according to a report on the introduction of a new SAP-based time-tracking system, its implementation was accompanied by questions from the workforce about the installation of critical monitoring technology, fueling feelings of mistrust, powerlessness, and fear, asking questions such as “What data is being recorded?” and “What do they do with the data about us?”¹¹⁹ Concerns about data collection became an increasingly important part of the discourse, especially in the late 1980s, and were a central issue in company agreements on SAP, as reflected by numerous guides and, for example, the WSO study.¹²⁰ To some extent, these concerns were addressed through the deployment of an increasingly sophisticated authorization system on the technical side, synchronized with regulations on the legislative side, but uncertainties and feelings of vulnerability unfolded along with technical refinement and still persist to this day.

When considering the question of the emergence of emotions associated with the introduction of SAP, shame should be considered as another feeling, because the software confronted inexperienced employees with external and their own expectations that they might not have been able to fulfill. In contrast to frustration, shame is less prominent in research, difficult to identify and localize, because it is more likely to be implied than explicitly expressed or attributed by third parties, as people do not talk about shame. Whether and how shame can be articulated at all is not a purely individual matter, but depends crucially on the narrative scripts, cultural interpretive patterns, and emotional repertoires that society provides.¹²¹

However, shame is not unknown in the discourse of technology: Turkle for example discusses a “robotic moment,” a feeling of shame experienced by users when interacting with computer-controlled robots such as a robot baby or a slimming robot coach when they feel emotions despite knowing that the robot is artificial.¹²² Günter Anders conceptualized the idea of a Promethean shame as a facet of the antiquatedness of man, who feels inferior in comparison to the products he has created and is ashamed “of the ‘shamefully’ high quality of things.”¹²³ According to Anders, shame arises not only from competition with the machine, but also from the latent danger of failure when operating the machine.¹²⁴ The latter in particular offers ample scope for shame-inducing constellations in the sense of a Promethean gap when introducing and appropriating SAP.

118 Medium-sized company that manufactures stirring and mixing systems, based in southwest Germany.

119 Eisenbeis-Trinkle, “Rechnergestützte Erfassung,” 20.

120 Wicke, *SAP-Einsatz* (WS-study), 147nn.

121 Scherke, *Emotionssoziologie*, 118nn.

122 Turkle, *Alone Together*, 21nn.

123 Anders, *Antiquiertheit des Menschen*, 21–97.

124 Anders, 23.

For many long-standing, experienced employees, the implementation of SAP meant having to grapple with new technology and, in many cases, losing the knowledge they had acquired. Affected employees often felt they had been demoted to beginner level, as a report by trainers with immediate access to user experience described: “SAP software seems to challenge the secure expert knowledge of the clerk. The employee’s self-confidence suffers and has to be rebuilt with the IT system.”¹²⁵ Constant updates, upgrades, and release changes, which require lifelong learning, also exacerbated the problems of experienced workers and, in this context, SAP had a great need for training.¹²⁶ Years of experience and expertise were useless in the face of the far-reaching changes in practices, and threw users back to the level of beginners; they were supposed to attend dedicated “beginners’ training” courses where shame could affect their self-esteem. A report in the trade union newspaper of IG Bau-Steine-Erden¹²⁷ stated on the introduction of SAP: “The experience and knowledge of the employees is no longer used. However, business processes work primarily because people with their knowledge and experience are involved. This is not taken into account by the SAP software with its engineering-based view of things ... the previous knowledge is devalued.”¹²⁸ Despite different roles and perspectives, SAP trainers and trade union representatives come to a similar conclusion: the devaluation of expertise, combined with the possibility of failure, is an attack on the self-confidence of experienced administrators and employees alike. Furthermore, when operating the system, end users are continually offered opportunities to fail at the supposedly different degrees of perfection of humans and computers. As already described, the integration of individual applications from departments of a company into a unified system simultaneously creates a form of publicness during data entry with increased visibility of the end user and thus room for shameful situations. Incorrect entries not only have a local impact, but also became public, transparent, and, according to the AFOS study, “striking.”¹²⁹

According to Frevert, shame practices include silence, shame defense, and possible avoidance behavior: “Those who are ashamed usually want to make themselves invisible, remain silent and lower their gaze” or “sink into the ground.”¹³⁰ In the context of implementing SAP, these shame practices can be seen particularly in avoidance behavior, resistance, rejection, non-use, and non-acceptance. Both

125 Baumann and Hauke, “SAP-Software,” 64.

126 Baumann and Hauke.

127 IG Bau-Steine-Erden: German Trade Union for Construction Materials.

128 N.N., Softwarehit SAP, *Der Grundstein* (magazine of the Trade Union for Construction Materials),

129 Barthel and Blume, *SAP, Arbeit, Management* (AFOS-study), 17.

130 Barthel and Blume.

ashamed and frustrated end users expressed their emotions by refusing or avoiding certain system functions. Sources confirm the refusal and non-use of system functions when, for example, the newspaper *Computerwoche* attests: "Often it is the case that users do not use certain functions out of ignorance or fear and the advantages of the software no longer come into play."¹³¹ End users returned to their favorite tools, even though the integrated system would have conveniently made the data from the various departments available. In line with this, project managers who introduced the software spoke of the "end user as a disruptive factor," seeing him/her as a "nightmare for many SAP project managers" who, after a great deal of work, "simply uses Excel again in all corners and ends, even though they have just introduced a nice new standard software."¹³²

User analyses and sources indicate reluctance, even confirm non-use of many functions, and suggest a latent avoidance behavior when introducing and using SAP in companies. This is also shown by SAP performance statistics on system transaction usage behavior in the mid-1990s, according to which 72% of all system transactions were not used or were used on average less than once a month.¹³³ In line with the underlying concept of "emotion as practice," it can be argued that frustration, mistrust, or shame occurred in combination with non-use and avoidance of system functions and thereby formed a mobilizing emotional practice to manage undesired feelings. According to this interpretation, which by no means excludes other readings, end users' avoidance behavior can be interpreted as a mobilizing emotional practice in Scheer's sense, with the effect of dampening unwanted feelings such as shame and frustration.¹³⁴

Reframing emotions by shifting responsibility

The often-expressed criticism of the complexity and user-unfriendliness of SAP as a possible cause of negative emotions in combination with a lack of acceptance, rejection, and non-use on the part of the end user led to adjustments to the software, not least on the basis of technological achievements such as the introduction of graphics-capable screens¹³⁵ which enabled the introduction of a graphical user interface (GUI) and a new, user-centered design with the R/3 software generation for client servers at the beginning of the 1990s. To reduce complexity and negative

131 Baumann and Hauke, "SAP-Software," 64.

132 Scherer and Schaffner, *SAP-Training: Konzeption*, 27n.

133 Tobias Rasch, *Nutzungsverhalten produktiver Kunden. Transaktionsnutzung auf Basis des Releases 2.2. SAP 1996*, 4.

134 Rasch, 30.

135 Hellge, *Paradigmenwechsel der Computer-Bedienung*, 11–92.

user feedback, well-known weaknesses were eliminated, technical improvements and ergonomic adjustments were implemented, and the interface was made more user-friendly.¹³⁶ This included greater attention to software-ergonomic design approaches, which resulted in the development of quick-entry masks to simplify complicated processes, masks, and data fields,¹³⁷ in the introduction of default and dummy values for mandatory fields, and the switching to an interactive documentation system with hypertext structures in a semantic network instead of sequential online help.

With the provision of solutions for technical inadequacies, with the individualization and flexibilization of the interface, faster reaction times, more ergonomics, with better security and authorization concepts, criticism of the software became less acceptable, less tolerable and more clearly fended off by the software provider. While SAP claimed the advantages of integrated data processing as a quality feature of its solutions and marketed them accordingly, it assigned the responsibility for exploiting them to the companies that used the software and to those who worked with them. As a result, inadequacies and defects of the technology were more likely to be declared and dismissed as operating errors and misuse than taken up as justified criticism of the software. This becomes clear, for example, in a lecture by SAP founder Tschira from 1989, in which he identified “increased data quality” as a “decision criterion” for the use of SAP, while the data quality “in real operation is emotionally with the end users.” He added firmly that this is an intended effect and that it is only fair if this occurs.¹³⁸ Thus, responsibility for data discipline and system quality seems more likely to be assigned to the end users, redirecting possible negative emotional effects of using SAP beyond its area of responsibility. From the end user’s point of view, this implies a latent assignment of blame in the case of supposedly poor system use and fundamentally changes the framing of emotions such as frustration and stress. In a similar vein, union-related voices criticized that the implementation and verifiability of the system for possible misuse would be left to the companies and users.¹³⁹ With reference to successful implementations and undeniable economic advantages for companies, SAP tended to redirect responsibility for the critical effects of its software during this period. This was also evident in a public debate between SAP and the German trade union for the public services sector (ÖTV), in which SAP interpreted negative consequences as abuse and misconduct on the part of the users.¹⁴⁰ According to this logic, it was not the provider of the technol-

136 Barthel and Blume, SAP, Arbeit, Management (AFOS study), 160n.

137 Barthel and Blume.

138 Tschira, Qualität hat höchste Priorität, 1989.

139 Konrad-Klein and Fickert, “Einführung von SAP-Programmen,” 15.

140 Tschira, Korrespondenz mit der ÖETV, 1988, 5.

ogy that bears responsibility for the consequences of its use, but rather the company that uses the software and the people who work with it.

Conclusion

The aim of the chapter was to demonstrate the emergence and relevance of different emotions when using a digital technology and their bidirectional effect on the technology as well as on the emotions themselves. The example of SAP shows how technology triggered emotions such as euphoria, enthusiasm, and pride in early users due to the discrepancy experienced with the previous punch-card technology, resulting in mobilizing emotional practices in form of intensive cooperation and co-innovation to foster the technical development and dissemination of the technology. In the context of the union-influenced discourse of the late 1980s and early 1990s, a broad swath of end users had a different, more critical perception of the technology, with experiences of frustration and stress, suspicion and fears in sometimes shame-inducing constellations with emotional practices of avoidance and non-use of functionality in order to manage emotions that went along with the new technology. Associated emotions could undergo a reframing, as demonstrated by the example of the negatively connoted frustration. On the one hand, such emotions contributed to continuous improvements, such as in the area of user design or user-friendliness; on the other hand, they were reframed by the software provider assigning responsibility for negative emotional consequences of software use to the users and their companies.

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