

Documenting the Use of Computers in Swedish Society between 1950 and 1980

Final Report on the Project "From Computing Machines to IT"

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Abstract

In this final report entitled "Documenting the Use of Computers in the Swedish Society between 1950 and 1980" I contextualize, describe and evaluate the project "From Computing Machines to IT: Collecting, Documenting, and Preserving Source Material on Swedish IT-History", which was carried out during 2007–08 as a collaboration between the Swedish Computer Society, the Division of History of Science and Technology at KTH and the National Museum of Science and Technology.

The aim of the project was to document how computing has shaped and transformed the Swedish society, and for this purpose, it adopted a user-centered perspective on history of computing. In this final report, I give the *raison d'être* for this approach. With the growing interest in the recent historiography of computing to understand 'how computing has changed the world' has followed a shift towards a more elaborated user perspective. I continue with a discussion on how the user concept has been understood by scholars. I point out that the literature on users fails to acknowledge two categories of users: those not involved in technological invention and innovation and those empowered by government or corporations with the authority to adapt technology to fit their needs. It is mainly the latter group that has had the power to shape major historical transformations, and, consequently, whose actions the project has aimed to document. I denote this particular group of users for "elite" users.

While surveying earlier international documentation efforts in the history of computing I conclude that these have mainly focused on documenting the role of pioneers in computing technology and largely ignored the users of computing technology. Thus, the research tools and methods that they have developed, used and refined for documenting the "few" pioneers – in particular the oral history interview – cannot uncritically be used for documenting the role of the "many" users. Adopting a user-oriented perspective calls for novel and innovative methods and tools. This is the reason why the project "From Computing Machines to IT" chose to employ an ensemble of different methods for documenting the role of computers in the Swedish society. Traditional oral history interviews and collections of autobiographies were used alongside with new self-structuring and time-saving methods such as witness seminars and Internet collection of memories (Writers' Web).

In the project more than 160 interviews were conducted, almost 50 witness seminars arranged, and about 230 autobiographies collected with the help of traditional questionnaires as well as the mentioned Writers' Web site. The created and collected sources consists of more than 8,000 pages of text. All in all, nearly 700 people contributed with their stories. The contacts with these people generated in turn several donations of written source material, drawings, photographs and artifacts.

The results of the project must be considered successful, and I believe that a key has been the active interest from the communities of computer users. In order to arouse their interest two things has been considered crucial. Firstly, the importance of an active and continuous collaboration between historians and practitioners. Secondly, the importance of creating *events* where practitioners are given the chance to gather for discussing and remembering their historical past and at the same time socialize. While witness seminars and the specially designed Writers' Web were seen as pure intellectual ventures by historians, they were actually received as social events by practitioners.

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Preface

The purpose of this final report entitled “Documenting the Use of Computers in the Swedish Society between 1950 and 1980” is to describe and evaluate the project “From Computing Machines to IT: Collecting, Documenting, and Preserving Source Material on Swedish IT-History,” which was carried out during 2007–08 (although the first network activities started already 2002) as a collaboration between the Swedish Computer Society (*Dataföreningen i Sverige*), the Division of History of Science and Technology at KTH and the National Museum of Science and Technology (*Tekniska museet*). The project dealt with the collection, documentation, and preservation of source material on Swedish IT-history between 1950 and 1980.

Its main financiers were the Bank of Sweden Tercentenary Foundation (*Riksbankens Jubileumsfond*), the Marcus and Amalia Wallenberg Memorial Fund (*Stiftelsen Marcus och Amalia Wallenbergs Minnesfond*) and the Swedish Arts Council (*Kulturrådet*). Additional funding was received from the Knowledge Foundation (*KK-stiftelsen*), the Swedish Governmental Agency for Innovation Systems (*Vinnova*) and the Sven Tyrén Foundation (*Sven Tyréns Stiftelse*). Specific activities in the project received furthermore funding from: Lantmäteriet, Skatteverket and Vägverket; Handelsbanken, Nordea, SEB and Swedbank; Folksam, Länsförsäkringar and Skandia; Volvo IT.

The people that have been participating in the project are far too many to be mentioned here. Instead they are listed and presented in Appendix IV: Participants in the Project.

“Bang, the last file goes to the garbage can. That’s how I remember the late summer 2007 when we at the staff [koncernstrategier] moves to Stureplan. Full digitization is what counts. I will not take the metro Hässelby–Stureplan just because I forgot a paper. Most of it is already thrown even if some documents were scanned. Thrown is also the 4 cm thick evaluation study of the TIDAS project. That’s typical, just as I was asked to write some lines about it.”¹

¹ “Pang, sista pärmen går i sopcontainern. Det är så jag ser sensommaren 2007 framför mig när vi på koncernstrategier flyttar in till Stureplan. Full digitalisering är vad som gäller. Jag har inte tänkt åka tunnelbana Hässelby - Stureplan t.o.r. för att jag glömt ett papper. Det mesta är redan slängt även om några dokument blev inskannade. Slängt är även den 4 cm tjocka efterstudien till TIDAS projektet. Typiskt, just som jag blev ombedd skriva några rader om det.” Erik Sandström, “En resa i TIDAs,” autobiography no. 54, www.tekniskamuseet.se/it-minnen (accessed June 1, 2009).

Documenting the Use of Computers in Swedish Society between 1950 and 1980

Looking at the role of computers in society over the past 60 years the change has been no less than dramatic.² While the use of computing technology in the 1950s was narrowly focused on scientific computations and specific administrative routines, it takes an almost infinite number of forms in today's society. Computers are on the way to develop into a *generic* technology. In its various shapes they have become an indispensable part of the world we live in. Virtually all sectors of society are computerized today. This expansion may be characterized as a far-reaching *fragmentation* of the use of computing technology.

Clearly, in understanding the role of computers in society, the *user* has to be taken into account. Looking at the historiography of computing one can also observe a shift in perspective during the recent years from inventors and innovations towards the more complex relationship between the design and use of computers. Research questions are changing as well. But what about research methods and research tools? How do we find sources that can help us answer the questions posed? Historians interested in the use of computing share many of the difficulties that scholars of contemporary history in general faces, such as archives not yet accessible, not migrated or even deleted digital sources et cetera. But in addition they have to deal with the fragmented character of the use of digital technology as well as sources that often are complicated and technical in content. Methods of contemporary history have been used by historians of computing since the beginning of the 1980s as a way to overcome these difficulties. In writing histories of the relatively "few" (but overwhelmingly American) pioneers in the field, particularly the oral history interview has been proven successful, but when it comes to writing the history of the "many" users (dispersed all over the world) the method, although still of great value, has its limitations. It is time-consuming, and the numbers of sources that can be created are thus limited. Adopting a user-oriented perspective calls for novel and innovative methods and tools to be used together with oral history interviews.

The project "From Computing Machines to IT" has been an effort to document Swedish computing history from a user-centered perspective. The main objective has been to create, collect and preserve source material on Swedish computing history and make it available on the web. The project was a collaboration between the Swedish Computer Society, the Division of History of Science and Technology at KTH and the National Museum of Science and Technology. The general organization of the project and the choice of methods were the product of a four-year long cooperation between these three parties. It went large-scale in January 2007 and was finished by the end of 2008. The approach consisted of several methods and tools. Traditional oral history interviews and collections of autobiographies were used alongside with new self-structuring and time-saving methods such as witness seminars and Internet collection of memories (Writers' Web).

In the project more than 160 interviews have been conducted, almost 50 witness seminars arranged, and about 230 autobiographies collected with the help of traditional questionnaires as well as the mentioned Writers' Web site (see Appendix I: List of Source Material). All in all, nearly 700 people contributed with their stories. The contacts with

² 'Computers' and 'information technology (IT)', and 'history of computing' and 'IT-history' as well, are used synonymously in this final report.

these people generated in turn several donations of written source material, drawings, photographs and artifacts.

In this introductory part, I shall discuss the recent shift towards a more elaborated user perspective in the international historiography of computing, and I shall relate the Swedish historical writing on computing to this development. Thereafter, I shall problematize the concept of the user in order to find, if not a precise, at least a loose definition of how we understand the term. I shall finally give a brief account of similar documentation projects both internationally and nationally, and I shall argue for the need to adopt and develop the methods and tools of contemporary history.

Towards a User Perspective

In a recent article Thomas J. Misa argues that although everybody knows that “computing has changed the world,” the existing historiography faces, strangely enough, difficulties in addressing this question directly, and he suggest that scholars shift to focus “on the interaction of computing—including hardware, software, and institutional dimensions—with large-scale transformations in economies, cultures, and societies”. Since citizens and policy makers today know that computing has changed the world, continues Misa, historians should help them understand this history.³

He distinguishes three thematic traditions in the field of history of computing. The first focused initially on identifying the “first” digital computers and to understand the technical, i.e. hardware and software, details, and it was dominated by the practitioners and pioneers of digital computing. Scholars criticized this approach as an “insider history” and they argued for, and pursued, a contextual technical history. The second thematic tradition showed instead an interest in the historical roots of the “information age,” and, as Misa points out, in this view computers were machines that “first and foremost processed information and only secondarily provided the functions of calculation, control, or communication”. The third thematic tradition stands for an institutional approach. Instead of emphasizing micro-studies of individual computing machines or macro-studies of the information society scholars shifted focus to the governmental, engineering or corporate institutions that shaped computing.⁴

Since none of these traditions explicitly address the question of how computing has changed the world, Misa propose the “making” of a fourth tradition that takes up the challenge of “comprehending the twin-fold shaping of computing and society”. On the one hand, “we need to show how developments in computing shaped major historical transformations, that is, how the evolution of computing was consequential for the transformations in work routines, business processes, government activities, cultural formations, and the myriad activities of daily life,” and, on the other, our narratives and analysis should “show how major historical transformations shaped the evolution of computing”. He, therefore, urge historians of computing to undertake studies that “situate computing within major historical transformations”.⁵

³ Thomas J. Misa, “Understanding ‘How Computing Changed the World’,” *IEEE Annals in the History of Computing* 29, no. 4 (2007), 52f. A similar shift in perspective for history of technology in general has earlier been advocated by David Edgerton, “From Innovation to Use: Ten Eclectic Theses on the Historiography of Technology,” *History and Technology* 16 (1999), 111–136.

⁴ Misa, “Understanding ‘How Computing Changed the World’,” 53ff.

⁵ *Ibid.*, 56ff.

I think that historians interested in undertaking studies in the direction Misa proposes are *obliged* to address the role of the user. They have to understand how businesses and government developed to leading users of computers. They have to understand how computers entered everyday life and transformed work as well as leisure activities. But they also need to go the other way round and examine how users has shaped digital technology and thoroughly changed our cultural and social understanding of what computers are.

There are examples of recent scholarship, albeit not many, that follows this trajectory. The three-volume *The Digital Hand* written by the remarkably productive James Cortada is perhaps the most notable example. Cortada asks how computers first were used, by whom, and why, and he examines how computing technology was appropriated in American manufacturing, transportation, retail, financial, telecommunications, media, entertainment, and public sector industries (40 in total) during the past half century. He also discusses how the industries in question changed the nature of computing technology. By naming his study *The Digital Hand*, and thus paraphrasing Alfred D. Chandler's *The Visible Hand*, Cortada wanted to emphasize "the crucial supportive role played by computers in helping companies and industries do the work for which they existed".⁶ Among Cortada's key findings are that use varied more by industry than by company, that companies as well as government agencies "preferred to implement new uses in increments," that they concentrated their use of computing to "improve internal business operations and lower operating costs" (and only secondarily to acquire new customers), that they used computers "only if they could both perform a function and support conventional managerial practices," that users and uses became more alike, regardless of industry, as technology and applications matured.⁷ As we shall see in Part II the outline of our project parallels Cortada's broad approach towards the use of digital technology.⁸

How, then, has history of computing or IT-history been written in Sweden? Is it possible to discern "traditions" in the Swedish historiography in a similar manner as Misa has done for the international historiography? And what about the user? Has he or she been taken into account? I would like to stress that Swedish historians in general have paid little attention to the role of computers in society. That only few scholars has dealt with history of computing in Sweden makes it difficult to identify traditions in Misa's sense,

⁶ James W. Cortada, *The Digital Hand: How Computers Changed the Work of American Manufacturing, Transportation, and Retail Industries* (Oxford, 2004); idem, *The Digital Hand: Volume 2, How Computers Changed the Work of American Financial, Telecommunications, Media, and Entertainment Industries* (Oxford, 2006); idem, *The Digital Hand: Volume 3, How Computers Changed the Work of American Public Sector Industries* (Oxford, 2008). He summarizes his three-volume work in James W. Cortada, "The Digital Hand: How Information Technology Changes the Way Industries Worked in the United States," *Business History Review* 80, no. 4 (2006), 755–766; idem, "Studying the Role of IT in the Evolution of American Business Practices: A Way Forward," *IEEE Annals in the History of Computing* 29, no. 4 (2007), 28–39.

⁷ Cortada, "The Digital Hand," 760f; idem, "Studying the Role of IT in the Evolution of American Business Practices," 33f.

⁸ Examples of other studies pursuing a user perspective in a similar fashion are: William Aspray & Paul E. Ceruzzi, eds., *The Internet and American Business* (Cambridge, MA, 2008); David Caminer, ed., *User-Driven Innovation: The World's First Business Computer* (London, 1996); Thomas Haigh, "Inventing Information Systems: The Systems Men and the Computers, 1950–1968," *Business History Review* 75, no. 1 (2001), 15–61; Arthur L. Norberg, *Computers and Commerce: A Study of Technology and Management at Eckert-Mauchly Computer Company, Engineering Research Associates, and Remington Rand, 1946–1957* (Cambridge, MA, 2005); Petri Paju, "National Projects and International Users: Finland and Early European Computerization," *IEEE Annals of the History of Computing* 30, no. 4 (2008), 77–91; JoAnne Yates, *Structuring the Information Age: Life Insurance and Technology in the Twentieth Century* (Baltimore, 2005).

but the studies undertaken so far are clustered, albeit loosely, around three different “themes”.

The first theme deals with computers and politics. Already in 1970 Jan Annerstedt and his co-authors discussed the introduction of computers in the state bureaucracy, the fall of the Swedish computing technology industry, IBM’s corresponding strong influence on the Swedish state, and the lack of an official policy on computers in the book *Datorer och politik*.⁹ Their study was followed by scholarship that partly questioned, partly complemented, it; with Hans De Geer’s *På väg till datasamhället* from 1992 as the most important contribution.¹⁰ Lars Ilshammar analyzed in turn the debates on computers and integrity and the establishment of Swedish legislations on digital information, and Jonas Johansson followed the political debate in Sweden (and Norway) on “the information society” during the 1990s.¹¹ Others focused on the computerization of the Swedish “welfare state” and the role of the labor movement in this process.¹² A reason, perhaps, for the relatively large interest in the relationship between computers and politics is the rise of the welfare state and the quickly expanding public sector in Sweden during the postwar period.

The second theme focuses in a rather straightforward manner on different aspects on the construction of Swedish main frame computers by the governmental agency Matematikmaskinnämnden (*the National Board for Computing Machinery*), and the companies Åtvidabergs Industrier (later Facit Electronics) and Saab (later Datasaab) as well as other players. A number of these studies have been undertaken by practitioners and pioneers in digital technology and focuses above all on technical details,¹³ while others that have been

⁹ Jan Annerstedt, Lars Forssberg, Sten Henriksson & Kenneth Nilsson, *Datorer och politik: Studier i en ny tekniks politiska effekter på det svenska samhället* (Lund, 1970). See also Jan Annerstedt, *Staten och datorerna: En studie av den officiella datorutvecklings- och datorforskningspolitiken* (Stockholm, 1969) and Sten Henriksson’s part in: Peter Naur, *Datamaskinerna och samhället*, med ett tillägg om svenska förhållanden av Sten Henriksson, Swedish transl. (Lund, 1969).

¹⁰ Hans De Geer, *På väg till datasamhället: Datatekniken i politiken 1946–1963* (Stockholm, 1992); Hans Glimell, *Återerövra datapolitiken! En rapport om staten och informationsteknologin under fyra decennier* (Linköping, 1989); Sten Henriksson, “Datapolitikens död och återkomst,” in *Infrastruktur för informationssamhället: Teknik och politik*, ed. Barbro Atlestam (Stockholm, 1995); Idem, “De galna åren – en efterskrift,” in *Informationssamhället – åter till framtiden*, ed. Barbro Atlestam (Stockholm, 2004); Kent Lindkvist, *Datateknik och politik: Datapolitiken i Sverige 1945–1982* (Lund, 1984).

¹¹ Lars Ilshammar, *Offentlighetens nya rum: Teknik och politik i Sverige 1969–1999* (Örebro, 2002); Jonas Johansson, *Du sköna nya tid?: Debatten om informationssamhället i riksdag och storting under 1990-talet* (Linköping, 2006).

¹² See for instance Thomas Kaiserfeld, “Computerizing the Swedish Welfare State: The Middle Way of Technological Success and Failure,” *Technology & Culture* 37 (1996), 249–279; Per Lundin, *Designing Democracy: The UTOPIA-project and the Role of Labour Movement in Technological Change, 1981–1986* (Stockholm, 2005).

¹³ Karl Johan Åström, “Early Control Development in Sweden,” *European Journal of Control* 13 (2007), 1–24; Tord Jöran Hallberg, *IT-gryning: Svensk datahistoria från 1840- till 1960-talet* (Lund, 2007); Jörgen Lund, *Från kula till data* (Stockholm, 1989); Kjell Mellberg, Gunnar Wedell & Bo Lindestam, *Fyrtio år av den svenska databistorien: Från Standard radiofabrik till ...?* (Stockholm, 1997); Per Arne Persson, “Transformation of the Analog: The Case of the Saab BT 33 Artillery Fire Control Simulator and the Introduction of the Digital Computer as Control Technology,” *IEEE Annals in the History of Computing* 21, no. 2 (1999), 52–64. Valuable historical information is also found in the computer club Datasaabs vänners book series on the history of Datasaab: Conny Johansson, ed., *Tema gudar* (Linköping, 2002); Bertil Knutsson, ed., *Tema bank: Datasaab och bankerna* (Linköping, 1996); Viggo Wentzel, ed., *Tema D21* (Linköping, 1994); Viggo Wentzel, ed., *Tema flyg: Flygets datorpionjärer* (Linköping, 1995); Sven Yngvell, ed., *Tema D22–D23: Tunga linjens uppgång och fall* (Linköping, 1997). Of interest are also several of the essays in: Janis Bubenko, Jr., John Impagliazzo & Arne Solvberg, eds., *History of Nordic Computing: IFIP WG9.7 First Working Conference on the History of Nordic Computing (HiNC1), June 16–18, 2003, Trondheim, Norway* (New York, 2005). On the Swedish difference engines of the 19th century, see Michael Lindgren, *Glory and Failure: The Difference Engines of Johann Müller, Charles Babbage and Georg and Edvard Schentz* (Linköping, 1987).

carried out by historians deals with cultural discourses, institutional settings and social networks centered around these early Swedish computers.¹⁴ Added to this theme, perhaps, should be studies that have addressed the physical establishment and the institutional settings of computer networks in Sweden, most notably the Internet.¹⁵

To the third thematic cluster belongs scholarship that adopts an interdisciplinary perspective on the relationship between man, information technology and society (*människa, informationsteknik och samhälle*). Since these studies normally put their main emphasis on developing economic or sociological theories, the historical understanding of the role of computers in society usually comes second. The historical case studies undertaken in these investigations are often of rather limited value for the historian since they are subordinated to the main objectives (discussing and developing theories).¹⁶ But in this thematic cluster we also find the few user-oriented approaches in the Swedish historiography of computing. Lena Olsson investigates how librarians carried out a computerization of Swedish research libraries during the 1970s, and Per Olov Broman as well as Gary Svensson describes and analyzes how artists appropriated computing technology during the postwar period in order to develop new artistic expressions.¹⁷

To conclude this brief survey of literature on the history of computing in Sweden, the question how computing has changed the world has not really been addressed by Swedish scholars. Likewise, explicitly formulated user-oriented approaches, save for the exam-

¹⁴ Anders Carlsson, "Tekniken – politikens frälsare?: Om matematikmaskiner, automation och ingenjörer vid mitten av 50-talet," *Arbetshistoria* 23 (1999), 23–30; idem, "Elektroniska hjärnor: Debatten om datorer, automation och ingenjörer 1955–58," in *Artefakter: Industrin, vetenskapen och de tekniska nätverken*, ed. Sven Widmalm (Hedemora & Möklinta, 2004), 245–285; Magnus Johansson, "Early Analog Computers in Sweden—With Examples From Chalmers University of Technology and the Swedish Aerospace Industry," *IEEE Annals in the History of Computing* 18, no. 4 (1996), 27–33; idem, *Smart, Fast and Beautiful: On Rhetoric of Technology and Computing Discourse in Sweden 1955–1995* (Linköping, 1997); idem, "Big Blue Gets Beaten: The Technological and Political Controversy of the First Large Swedish Computerization Project in a Rhetoric of Technology Perspective," *IEEE Annals in the History of Computing* 21, no. 2 (1999), 14–30; Tom Petersson, *I teknikrevolutionens centrum: Företagsledning och utveckling i Facit, 1957–1972* (Uppsala, 2003); idem, "Facit and the BESK Boys: Sweden's Computer Industry (1956–1962)," *IEEE Annals of the History of Computing* 27, no. 4 (2005), 23–30.

¹⁵ Lena Andersson-Skog, "Från normalspår till bredband: Svensk kommunikationspolitik i framtidens tjänst 1850–2000," in *Omvandlingens sekel: Perspektiv på ekonomi och samhälle i 1900-talets Sverige*, eds. Lena Andersson-Skog & Olle Krantz (Lund, 2002), 117–143; Barbro Atlestam, "Datornät," in *Infrastruktur för informations-samhället: Teknik och politik*, ed. Barbro Atlestam (Stockholm, 1995), 113–127; Inga Hamngren & Jan Odhnoff, *De byggde Internet i Sverige* (Stockholm, 2003). Although the historical findings are limited, the essays in the interdisciplinary anthology Magnus Karlsson & Lennart Stureson, eds., *The World's Largest Machine: Global Telecommunications and Human Condition* (Linköping, 1995) as well as Lars Ilshammar, "Från supervapen till supermarken: Utvecklingen av Internet 1957–1997," in *Den konstruerade världen: Tekniska system i historiskt perspektiv*, eds. Pär Blomkvist & Arne Kaijser (Stockholm & Stehag, 1998), 323–343, and Bernt Skovdahl, *Den digitala framtiden: Om förutsagda informations-samhällen och framväxande IT-realiteter* (Stockholm, 2009) might be of interest.

¹⁶ Joakim Appelquist, *Informationsteknik och organisatorisk förändring: Teknik, organisation och produktivitet inom svensk banksektor 1975–2003* (Lund, 2005); Christer Johansson & Jörgen Nissen, *Människa, informationsteknik, samhälle: MITS – en forskargrupp*, Tema-T arbetsnotat 160 (Linköping, 1996); Magnus Karlsson, *The Liberalisation of Telecommunications in Sweden: Technology and Regime Change from the 1960s to 1993* (Linköping, 1998); Jörgen Nissen, *Pojkarna vid datorn: Unga entusiaster i datateknikens värld* (Stockholm, 1993).

¹⁷ Per Olov Broman, *Kort historik över framtidens musik: Elektronmusiken och framtidstanken i svenskt 1950- och 60-tal* (Stockholm, 2007); Lena Olsson, *Det datoriserade biblioteket: Maskindrömmar på 70-talet* (Linköping, 1995); Gary Svensson, *Digitala pionjärer: Datorkonstens introduktion i Sverige* (Stockholm, 2000). See also Ulf Sandqvist, *Digitala Drömmar: En studie av svenska dator- och tv-spelsbranschen 1980–2005* (Umeå, 2007).

ples mentioned above, are by and large absent.¹⁸ This is perhaps even more surprising for the Swedish historiography than for the international given that Sweden has been salient in involving the user in the design of computing technology and in systems development.¹⁹

But Who Is the User?

At this moment, when I have urged historians to address the question on how computing changed the world by adopting a user perspective, it is time to scrutinize the user as a concept. Who is actually the user? How has the category been defined and discussed by scholars? And how do we define it?

As a point of departure for my discussion in this section I shall take Nelly Oudshoorn's and Trevor Pinch's book *How Users Matter* from 2003, since it gives a nice survey of the state-of-the-art of user-oriented approaches in the quickly growing field of Science and Technology Studies (STS).²⁰ Thereafter I shall give an account of the critique that their work has aroused among historians, and in the next section I shall present an approach and a definition that we advocate.

Oudshoorn and Pinch are concerned with "the role of users in the development of technology in general," and they pay attention to how users consume, modify, domesticate, and resist technologies. Even if they put a main emphasis on "what users do with technology," they also claim to be interested in "what technologies do to users".²¹

Oudshoorn and Pinch notices that users and technology are too often seen as separate objects of research (it should be noted here though, that when they are referring to earlier research it is usually STS they have in mind). Instead they want to view users and technology as "two sides of the same problem—as co-constructed." Their aim with the anthology is to go beyond "technological determinist views of technology and essentialist views of users' identities," and they suggest studies of co-construction of users and technologies as a way to reach this goal.²² Oudshoorn and Pinch distinguish four different approaches to user-technology relations in the earlier literature: the SCOT approach, feminist approaches, semiotic approaches, and cultural and media studies.

The social construction of technology (SCOT) approach was one of the first in technology studies that drew attention to the user. Its founding fathers Trevor Pinch and Wiebe Bijker saw users as a social group that played a part in the construction of technology. They observed that different social groups could construct radically different meanings

¹⁸ Other exceptions are a number of short essays in *Dadalus*, the annual of National Museum of Science and Technology: Mats Höjeberg, ed., *Dadalus 2002: Tekniska museets årsbok: Dator till vardags* (Stockholm, 2001).

¹⁹ Pioneering was the so-called Scandinavian school in systems development. Jørgen Bansler, *Systemutveckling: Teori och historia i skandinaviskt perspektiv* (1987), Swedish transl. (Lund, 1990); Kristo Ivanov, *Systemutveckling och ADB-ännets utveckling*, Rapport LiU-IDA-R-84-1 (Linköping, 1984); Markku I. Nurminen, *People or Computers: Three Ways of Looking at Information Systems* (1986), English transl. (Lund, 1988).

²⁰ Nelly Oudshoorn & Trevor Pinch, eds., *How Users Matter: The Co-Construction of Users and Technologies* (Cambridge, MA, 2003). It should be noted here that the concept of user also is a matter for discussion in information systems research and other related ICT-disciplines. See for instance, Roberta Lamb & Rob Kling, "Reconceptualizing Users as Social Actors in Information Systems Research," *MIS Quarterly* 27, no. 2 (2003), 197–236.

²¹ Nelly Oudshoorn & Trevor Pinch, "Introduction: How Users and Non-Users Matter," in *How Users Matter: The Co-Construction of Users and Technologies*, eds. Nelly Oudshoorn & Trevor Pinch (Cambridge, MA, 2003), 1f.

²² *Ibid.*, 2f.

of a technology—a phenomenon they denoted interpretive flexibility. As a technology eventually stabilized—the interpretive flexibility vanished and a dominant design, a dominant meaning and a dominant use emerged in its place. Since many of the classic SCOT studies focused on the early stage of technologies, they, as Oudshoorn and Pinch points out, did not show any larger interest in how users could modify stable technologies.²³

Moving to feminist scholars these have played an important role in drawing attention to users. Their point of departure was the neglect of women’s role in the development of technology. By focusing on users and use rather than on engineers and design, they argued, it would be possible to go “beyond histories of men inventing and mastering technology”. The work by Ruth Schwartz Cowan played a crucial role, and her concept of “the consumption junction,” defined as “the place and time at which the consumer makes choices between competing technologies,” played a pivotal role.²⁴ Gender studies as well as technology studies reflects, as emphasized by Oudshoorn and Pinch, a shift in the conceptualization of users from “passive recipients to active participants”. Feminist scholars have also acknowledged that “users come in many different shapes and sizes,” and have tried to cope with the diversity of users (and the implicit difference in power relations) by differentiating between “end users,” “lay end users” and “implicated actors”.²⁵ Oudshoorn and Pinch underlines that feminist studies includes an *explicit political agenda*: “to increase women’s autonomy and their influence on technological development.”²⁶

The semiotic approach was in turn introduced by STS scholars who extended semiotics, studies on how meanings are constructed, “from signs to things”. I will not detail my account of this approach, but it should be mentioned that the concepts of “configuring the user” and “script” are central to this approach. The former refer to how to designers configure users, but also to how designers are configured by both users and their own organization, while the latter tries to “capture how technological objects enable or constrain human relations as well as relationships between people and things”. Oudshoorn and Pinch largely dismisses this approach, since, they argue, it stays to close to the old linear model of technological innovation, which gives priority to the agency of designers and producers over the agency of the users.²⁷

Cultural and media studies has, in contrast to technology studies, always had users and consumers as its major topic of analysis. As Oudshoorn and Pinch points out their central thesis is that “technologies must be culturally appropriated to become functional”. In the 1980s many prominent intellectuals such as Pierre Bourdieu, Mary Douglas and Baron Isherwood, and Jean Baudrillard made important contributions to this tradition. It should also be mentioned that the semiotic approach eventually made its way in cultural

²³ An exception is Ronald Kline’s & Trevor Pinch’s article “Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States,” *Technology and Culture* 37, no. 4 (1996), 763–795. Oudshoorn & Pinch, “Introduction,” 3f.

²⁴ Ruth Schwarz Cowan, “The Consumption Junction: A Proposal for Research Strategies in the Sociology of Technology”, in *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, eds. Wiebe E. Bijker, Thomas P. Hughes & Trevor Pinch (Cambridge, MA: MIT Press), 263; Oudshoorn & Pinch, “Introduction,” 4ff.

²⁵ *End users* are “those individuals and groups who are affected downstream by products of technological innovation,” the concept *lay end users* highlights “some end users’ relative exclusion from expert discourse, and *implicated actors* are “those silent or not present but affected by the action”. Oudshoorn & Pinch, “Introduction,” 6.

²⁶ *Ibid.*, 4ff.

²⁷ *Ibid.*, 7ff, 15.

and media studies. But the perhaps most interesting contribution to the study of user-technology relations from cultural and media studies is the notion of “domestication” introduced by Roger Silverstone. With the concept he describes how the integration of technological objects involves “a taming of the wild and a cultivation of the tame,” and he has specified four phases of domestication: appropriation, objectification, incorporation, and conversion.²⁸ Domestication is understood as a process in which both technical objects and people may change, and may thus, according to Oudshoorn and Pinch, inspire to scholarship that “transcend the artificial divide between design and use” and reconceptualize “the traditional distinction between production and consumption”.

With *How Users Matter* Oudshoorn and Pinch want to bridge the above presented approaches to user-technology relations and explore “the creative capacity of users to shape technological development in all phases of technological innovation.”²⁹ In order to reach a thorough understanding of “the role of the users in technological development,” they argue, “the multiplicity and diversity of users, spokespersons for users, and locations where the co-construction of users and technologies takes place” have to be taken into account.³⁰

But exactly what kind users do they have in mind? They do not give an explicit definition, but from their discussion it is clear that they are only interested in users or non-users that *matter* in the development of technology (*or* in the design, the production, and the selling of technologies *or* in the stabilization and de-stabilization of technologies). Users or non-users that do *not* shape the technological development lies outside the scope of their book and are not included in their (implicit) definition of users.

Indeed, as John Krige points out in an insightful review of *How Users Matter*, Oudshoorn and Pinch, although pioneering in bringing in the user, still focus “on their shaping of the process of technological design and innovation”. Their book, thus, only addresses a small subset of users: those that are “articulate, organized, and living in rich industrialized countries where spaces are created for the individual consumer and the citizen to express their interests.” But most “end-users” do not have this capacity; they are, as he remarks, “the sometimes passive, sometimes willing, sometimes resentful ‘victims’ of technological change, deeply affected by it, yet effectively powerless to shape its trajectory.”³¹ A focus on them, continues Krige, “and on that category of intermediate users, notably the coercive apparatus of the state and some major corporations, who demand technologies that disempower people, and peoples, would provide a far less positive picture of the role of human agency in shaping technology”.³²

²⁸ “Appropriation occurs when a technical product or service is sold and individuals or households become its owners. In objectification, processes of display reveal the norms and principles of the ‘household’s sense of itself and its place in the world’. Incorporation occurs when technological objects are used in and incorporated into the routines of daily life. ‘Conversion’ is used to describe the processes in which the use of technological objects shape relationships between users and people outside the household. In this process, artifacts become tools for making status claims and for expressing a specific lifestyle to neighbors, colleagues, family, and friends.” Ibid., 14f.

²⁹ Ibid., 16.

³⁰ Ibid., 24.

³¹ John Krige, “Review: How Users Matter: The Co-Construction of Users and Tehnology by Nelly Oudshoorn & Trevor Pinch,” *Contemporary Sociology* 35, no. 1 (2006), 32. David Edgerton also criticizes Oudshoorn and Pinch using similar arguments. David Edgerton, *The Shock of the Old: Technology and Global History Since 1900* (Oxford, 2007), ix–xviii.

³² Krige, 32.

Following Krige there are hence two very important groups not included in Oudshoorn's and Pinch's implicit definition of the user: those not contributing to the process of technological design and innovation, i.e. the majority of the people in the world, and those empowered by government or corporations with the authority to adapt technology to fit their needs.

Thus, they address far from *all* users that *matter* in the development of technology (technological innovation), which is precisely a point made by JoAnne Yates in her article "How Business Enterprises Use Technology" from 2006. She criticizes the SCOT approach, including Oudshoorn's and Pinch's *How Users Matter* in that tradition, for only taking the individual user into account. In the SCOT (or the STS) approach firms only enter the picture as the producers and the distributors of technological artifacts or of products of technology to individuals.³³ Yates argues for broadening the concept of "technology users or consumers to include business enterprises as well as individuals". Manufactured items are in many cases "created and sold to only other institutional users, whether a business enterprise or a government or nonprofit organization". An example of artifacts involved in this kind of "business-to-business (B2B) transactions" are, or rather were, mainframe computers.³⁴ In fact, according to Yates, critical decisions in Cowan's "consumption junction" (see above) are in many cases taken by an organization consisting of many individuals with different roles and interactions.³⁵

She also argues for extending the focus on users in the scholarship to include studies on technology use, or "technology-in-practice," as well. By studying technology use, she continues, we will be able to understand "the early and ongoing influence of technology on firms and individuals, and these users' influences on the technology and on innovation in general."³⁶

It should be noted here that the above mentioned James W. Cortada takes up Yates' argument when discussing the *raison d'être* for his monumental study *The Digital Hand*.³⁷

The critique raised against Oudshoorn's and Pinch's discussion of user-technology relations may be summarized in three points. First, they are still caught in the powerful master narrative of invention and innovation when discussing user-technology relations. Their interest of the role of users or non-users is limited to technological invention and innovation. But, as David Edgerton has pointed out, most users on the globe are not involved in these processes. Second, they do not address all users that matter in technological development, i.e. intermediate users of technology such as corporations and governments. Third, and related to the second, they only consider individual users, not institutional users such as firms, governments or non-profit organizations.

Introducing the "Elite" User

But how do we understand the term 'user' then? As the above discussion shows, it is obviously difficult to reach "closure" on a definition of the concept. The different positions are nevertheless helpful for us in defining what *we* mean with users and which groups we primarily identify as users.

³³ JoAnne Yates, "How Business Enterprises Use Technology: Extending the Demand Side Turn," *Enterprise and Society* 7, no. 3 (2006), 426f.

³⁴ *Ibid.*, 430.

³⁵ *Ibid.*, 434.

³⁶ *Ibid.*, 424f.

³⁷ Cortada, "Studying the Role of IT in the Evolution of American Business Practices," 30f.

We are primarily interested in the groups of users which have the power to shape major historical transformations. These may be bureaucrats, businessmen, managers, but most of all professionals. We call them “elite” users.³⁸ This is not to say, however, that users in Oudshoorn’s and Pinch’s sense do not have the possibility to change the world. They sometimes do, as the cases in their book indeed shows, but it is obvious that they are not in the same privileged position as elite users. They are not supported by political and economic power to the same extent. Moreover, they are not educated, organized and trained in the same fashion as elite users, and therefore they do not share beliefs, values, and norms to the same extent as these.

While Yates argues for extending the user concept to include organizations such as firms, government agencies and non-profit organizations, we will reserve the concept of elite users for individuals or groups of individuals.³⁹ Besides the obvious practical reason that it is not possible to carry out interviews with organizations,⁴⁰ there is another argument for constraining the concept to the individual, an argument that we borrow from the scholarship on the study of elites, which has moved from a position where class and state were central analytical concepts to a position where agency, exclusivity and mode of relationship are placed in the foreground.⁴¹ As George E. Marcus has pointed out the notion of elites has a personal, informal trait:

In modern societies, elites are creatures of institutions in which they have defined functions, offices, or controlling interests, but in relation to institutions, they recreate a domain of personal relationships that extends across functional and official boundaries. Institutions seem to have a life of their own, and society can be explained wholly in terms of the working of formal organizations. But what if the behavior of the same organizations is attributed to the activities of their controlling elites in closed informal communities? The theoretical vision of modern society then is less a model of the workings of formal organizations than it is an image of the internal cultures of ruling groups and of the effects of their activities upon deceptively monolithic, automatic institutional processes in which or against they operate.⁴²

Ultimately power is connected to individuals, rather than impersonal processes or institutions.⁴³ Here it is necessary to introduce a distinction between the “elite” users as we

³⁸ As alternative concepts we considered “qualified” users as well as “critical” users, but rejected both in the end. An objection raised towards the first, is that many users that can be identified as qualified do not necessarily have the position or the possibility ‘to change the world’, i.e. that they are qualified does not mean that possess elite attributes. An objection to the second concept is that it is already deployed by researchers on user-centered design and they do it with a different purpose. With “critical users” they refer to “users with severe disabilities (motion, sensory or cognitive impairments) who can illustrate the extreme end of the usability spectrum and on whom the impact of poor design is greatest in term of function and stigma. [...] Such users are in a valid critical position because they have similar lifestyles, aspirations and tastes as creative designers, but have to adapt to ill thought out products that may not have been designed with consideration of their capability limitations.” See for instance Hua Dong, et al., “Critical User Forums: An Effective User Research Method for Inclusive Design,” *Design Journal* 8, no. 2 (2005), 49–59.

³⁹ We do, however, understand the analytical value in discussing users on an aggregated level.

⁴⁰ In a discussion of elite oral history Seldon and Pappworth defines for instance elites in society as those individuals who “rose to the top of their chosen occupation”. Anthony Seldon & Joanna Pappworth, *By Word of Mouth: ‘Élite’ Oral History* (London, 1983), 6.

⁴¹ George E. Marcus, “Elite as a Concept, Theory, and Tradition,” in *Elites: Ethnographic Issues*, ed. George E. Marcus (Albuquerque, 1983), 7–13; Niklas Stenlås, *Den inre kretsen: Den svenska ekonomiska elitens inflytande över partipolitik och opinionsbildning 1940–1949* (Lund, 1998), 21–23.

⁴² Marcus, 16f.

⁴³ Stenlås, 23.

define them and the scholarly understanding of “elites”. Scholars devoted to the study of the latter usually deals with economic and political elites – those with the outmost power. Elite users do not necessarily possess the outmost economic or political power, but we argue that they nevertheless are in a position to shape major historical transformations due to their organizational, technical and scientific skills and positions.

We do not see “elite” users as a distinct, given group of individuals. Elite users may change arenas, functions or positions, i.e. they have careers. Designers or producers of a certain technology may shift arena, function or position and become highly qualified users of the very same technology. Qualified users occupying a key role in an organization may, on the other hand, modify or transform technology to a unique product which they after a while start to manufacture and sell as producers and salesmen. And while a scientist develops a certain technology, he or she has to use other technologies. The composition of elite users thus differs depending on the arena or time period studied as well as perspective taken. The concept “elite” user, as we understand it, is therefore necessarily dynamic.

It also means that users are given the attribute ‘elite’ *in relation* to other users (hence seen as being ‘non-elite’). The advent of the PC in the 1980s, for instance, led eventually to a mass use of computers and people that previously had been elite users lost their elite status, when the digital technology suddenly became accessible for the majority.

Elite users’ involvement with technology may furthermore be described with Oudshoorn’s and Pinch’s notion of users and technology as co-constructed.⁴⁴

To summarize, we are certainly interested in users as Oudshoorn and Pinch define them, and we do not neglect “end users” in Krige’s and Edgerton’s sense, but above all we direct our attention towards “elite” users of computing technology (and their interaction with designers, producers, purchasers and salesmen as well as manufacturers and suppliers in both the public, the private and the military sector). The reason for doing that is a simple one, we want to understand how computing has changed the world.

The Need for Documenting the Recent Past

But do we really need to collect and create sources on the use of computers in the Swedish society during the latter part of the twentieth century? Are there not already an abundance of material history of computing in Swedish archives and libraries just waiting to be “discovered” by historians? The situation *in general* for the twentieth century historian is certainly abundance. The salient (source critical) problem for the historian is indeed to find methods to navigate through a flood of material. A set of historical questions often makes a point of departure. Are the sources relevant given the posed questions? Are they representative for the historical phenomena that interest the scholar?⁴⁵

This is, of course, the situation in general. As always there are exceptions. Some archives may have restricted access to the relevant material. Other material may be in private hands. Material in archives of firms and non-profit organizations may have been sorted out due to lack of space or change of ownership. Fusions have occasionally led to the disappearance of whole archives. Even government authorities throw now and then away

⁴⁴ Yates even suggests that the Oudshoorn’s and Pinch’s notion of users and technology as co-constructed could be extended from individual to firm users. Yates, “How Business Enterprises Use Technology,” 437.

⁴⁵ Maria Ågren, “Synlighet, vikt, trovärdighet – och självkritik: Några synpunkter på källkritikens roll i dagens historieforskning,” *Historisk tidskrift* 2005:2, 249–262.

archive material because of ignorance (the worst sinners in this respect are, somewhat ironically, universities and cultural institutions). But these kinds of particularities are of course not exclusive for the twentieth century. Evidence has always disappeared, and will probably continue to disappear. We have to acknowledge that a complete historical record is an illusion.

Of greater concern for us, as Roy Rosenzweig points out, is that the general situation is changing dramatically as we move into a “digital era”. Practices are rapidly being transformed. Government records are digitized. Traditional works like books, journals and films are increasingly “being born digitally”. Paper correspondence is being replaced with e-mails. And web based media such as today’s Facebook, MySpace and YouTube will probably increase in scale and scope at the cost of “analog” media.⁴⁶

At first glance it seems that the future historian will have access to even more sources. Phone calls have for instance, at least to some extent, been replaced by e-mails. Perhaps an essentially complete historical record is not an illusion after all? But then we forget that evidence in the digital era is fragile. Even if the digital sources are here today, they may be gone tomorrow. While paper-based media deteriorate slowly and unevenly, digital media may fail completely – a single damaged bit can render an entire document unreadable. The life-spans of digital media are also considerably shorter than the ones of acid-free paper and micro films, but, stresses Rosenzweig, changes in hardware and software pose far greater problems than the media itself. Platforms and programs change constantly.⁴⁷ A solution is to “migrate” the data stored in old formats to up-to-date formats. Costs for migration will be very high, however, given that hardware and software will continue to change.⁴⁸ While the preservation of digital sources is linked with numerous technical problems, Rosenzweig argues that the social, economic, legal and organizational problems are far worse. There are yet no established practices on how to handle digital material. Web pages come and go. E-mails to or from an organization are usually administered by the organization’s IT support, with little or no knowledge at all of archival practices and obligations, instead of the same organization’s archivists. And how shall national archives and libraries deal with the international web? To conclude this short digital detour we cannot at all be assured that there will be an abundance of sources on our contemporary history. We may even have to face a scarcity of sources in the future.

But, on the other hand, since we are dealing with the period between 1950 and 1980 one could argue that most of the material is in paper form and not really affected by the changes described above. So the question basically remains: Do we really need more sources?

Ultimately the answer depends on which set of questions we are interested in. If sources that are relevant and representative given our historical questions exist, it will of course

⁴⁶ Roy Rosenzweig, “Scarcity or Abundance? Preserving the Past in a Digital Era,” *The American Historical Review* 108 (2003), 735–762. The Center for History and New Media (CHNM) at George Mason University also provides several insightful essays and discussions on history in the digital era at their website: <http://chnm.gmu.edu/> (accessed June 10, 2009).

⁴⁷ Rosenzweig, 741–745.

⁴⁸ A more straightforward solution is to print out digital documents on paper, but then remains of course complex, dynamic and interactive objects such as computer games, digital art and web pages generated out of databases. Since virtually every web page is linked to every other and retaining the full complexity requires ultimately the whole web to be preserved. Thomas J. Misa, “Organizing the History of Computing: ‘Lessons Learned’ at the Charles Babbage Institute” (paper prepared for Conference on the History of Nordic Computing, 21–23 August, 2007, Turku, Finland); Rosenzweig, 742.

not be critical to create and collect new sources (although, as I will argue below, new sources may still be valuable as a complement to existing ones). But that is not always the case. Our existing archival sources often display a strong bias. The activities of the nation-state and organizations (governmental as well as non-governmental) are in general well documented while the activities of other historical actors may be not documented at all. As John Tosh points out written sources are primarily the result of grown-up men's work and therefore it is difficult to find sources on the experiences of women (that not belonged to the letter writing bourgeoisie) and children. And on many other social groups such as non-union labor, peddlers or immigrants there is an almost complete lack of written sources.⁴⁹ This bias in the written sources has often been reflected in the historians' investigations and choice of questions. Labor history deals with trade union officials more often than the rank and file, history of housing with housing policies and sanitary reforms rather than the everyday life of tenants, history of technology with planning and construction of large technological systems (in the Western world) rather than their use (in the rest of the world), and history of science with prominent scientists and laboratories rather than amateur scientists.

With the turn towards (Marxist) social history during the 1970s, and the history of everyday life (*Alltagsgeschichte*), the following decade, historians began to explore new fields in the landscape of the past.⁵⁰ In doing so they started to look for alternative sources in a more systematic manner than before. They turned their attention towards a multitude of non-written sources such as artifacts, landscapes, movies, oral sources, pictures, radio and television, and they often used and interpreted these in very innovative ways.⁵¹ This turn towards alternative sources have been salient in the history of technology, science and medicine as well as its "sub discipline" history of computing.

Creating and Collecting Oral Sources

Oral sources differ from other types of sources (both written and non-written) in one crucial aspect: they are *created* in the meeting between the interviewer and the interviewee.⁵² They are, to use Pinch's and Oudshoorn's term, co-constructed by the historian and the historical subject.⁵³ Below I will discuss in more detail how oral sources have been created and collected by scholars – and for what purpose.⁵⁴ To begin with I will give an account to a predecessor and a parallel phenomenon, namely the collection of autobiographies and the like with the help of questionnaires. Although these are not oral sources in a strict sense they essentially share the same characteristics.

⁴⁹ John Tosh, *The Pursuit of History: Aims, Methods and New Directions in the Study of Modern History* (1984), 4. ed., with Seán Lang (Harlow, 2006), 314f.

⁵⁰ Georg G. Iggers, *Historiography in the Twentieth Century: From Scientific Objectivity to the Postmodern Challenge* (1997), with a new epilogue by the author (Middletown, CT, 2005), chapter 7 & 9.

⁵¹ See for instance Anders Brändström & Sune Åkerman, eds., *Icke skriftliga källor: Huvudtema I* (Umeå, 1991); Mats Burström, *Samtidsarkeologi: Introduktion till ett forskningsfält* (Lund, 2007); Ronald E. Doel & Thomas Söderqvist, *The Historiography of Contemporary Science, Technology, and Medicine: Writing Recent Science* (New York, 2006); David W. Kingery, *Learning from Things: Method and Theory of Material Culture Studies* (Washington, 1996); Steven Lubar & David W. Kingery, eds., *History from Things: Essays on Material Culture* (Washington, 1993); Simon Schama, *Landscape and Memory* (London, 1996); Bosse Sundin & Sverker Sörlin, "Landskapets värden: Kring miljö- och kulturmiljövård som historiskt problemfält," in *Miljön och det förflutna: Landskap, minnen, värden*, eds. Richard Pettersson & Sverker Sörlin (Umeå, 1998), 3–19.

⁵² It should be noted here that historians often distinguish, perhaps subconscious, between written and non-written sources. While this distinction by and large reflects the historians' practice that is dominated by archival research, it is nevertheless misleading from a source critical point of view.

⁵³ In what follows I will restrict the discussion of alternatives to written sources to sources created in the meeting between scholars and their likes on the one hand, and historical subjects on the other.

⁵⁴ Distinguish between the research interview and the archival interview. See de Chadarevian, 60.

In Sweden folklorists and philologists became interested in documenting different aspects of *folkkultur* (popular culture) already in the 1870s and created the ethnographical collections that eventually led to Nordiska museet and Skansen in Stockholm. They developed so-called *frågelistor* (questionnaires) as a method for creating and collecting sources on popular culture, and documentation work along these lines was institutionalized during the first decades of the twentieth century. The documentation focused mainly on peasant culture and dealt with various subjects such as “arbete, trötthet och vila” (work, fatigue and rest), “lynne och karaktär” (temper and character), “brott och straff” (crime and punishment), “källor och brunnar” (springs and wells), and “belysning” (lightning). During the 1940s folklorists at Nordiska museet began to create and collect *arbetarminnen* (workers’ memories) in order to cope with the bias towards agrarian culture in the earlier collections. Memories from more than 30 different occupational groups were collected with the help of questionnaires and the resulting documentation were published in several volumes such as *Sågverksminnen* (Sawmill Memories), *Järnvägsminnen* (Railroad Memories), *Bokbindarminnen* (Bookbinder Memories) and *Stenbuggarminnen* (Stone-Cutting Memories).⁵⁵ Collection of memories and autobiographies with the help of questionnaires has up to the present continued to be a salient feature in Swedish ethnology and folklore,⁵⁶ and as a more recent example serves a selection of the collected life stories of engineers published by Nordiska museet in the volume *Framtiden var vår* (The Future Was Ours). The autobiographical material that this volume contains gives a comprehensive and nuanced picture of the engineering profession and its role in Swedish society.⁵⁷

The dominating method, however, for coping with the bias in the written sources has been to create and use oral sources. Historians since ancient Herodotus and Thucydides has relied on the spoken word, but the nineteenth century development of an academic history discipline led to the primacy of archival research and documentary sources, and a marginalization of oral evidence. Although oral sources continued to be consulted by historians they were not treated as genuine documents, i.e. they were not footnoted.⁵⁸ If historians were hesitant to the use of oral sources, folklorists and social scientists took a more positive stance. A pioneering project devoted to collect oral accounts of the past in form of life histories was launched in the United States in the late 1930s. The Federal Writers’ Project as it was called produced in particular oral histories on labor and slave memories, but without the methodological rigor that the documentation of oral histories later became associated with.⁵⁹ The development of new recording techniques, i.e. the tape recorder, spurred the interest for preserving the spoken word. Allan Nevins, who also coined the term “oral history”, carried out the first modern oral history project at

⁵⁵ Documentation of workers’ memories were also carried out in Denmark by Nationalmuseet and in Norway by Norsk Folkemuseum. Knut Kjeldstadli, *Det förflutna är inte vad det en gång var* (1992), Swedish transl. (Lund, 1998), 185; Sune Åkerman, “Mjukdata,” in *Usynlig historie: Foredrag fra den 17. Nordiske fagkonferensen for historisk metodelære i Tranum Klit 19.–23. mai 1981*, eds. Bjørn Qviller & Birgitte Wählin (Oslo, 1983), 47–54.

⁵⁶ Charlotte Hagström & Lena Marander-Eklund, eds., *Frågelistan som källa och metod* (Lund, 2005); Bo G. Nilsson, Dan Waldetoft & Christina Westergren, eds., *Frågelist och berättarlädje: Om frågelistor som forskningsmetod och folklig genre* (Stockholm, 2003).

⁵⁷ Dan Waldetoft, ed., *Framtiden var vår: Civilingenjörer skriver om sitt liv och arbete* (Stockholm, 1993).

⁵⁸ Soraya de Chadarevian, “Using Interviews to Write the history of Science,” in *The Historiography of Contemporary Science and Technology*, ed. Thomas Söderqvist (Amsterdam, 1997), 54f; Alistair Thomson, “Four Paradigm Transformations in Oral History,” *The Oral History Review* 34, no. 1 (2006), 51.

⁵⁹ The project had for instance to rely on human note-takers because of the absence of audio recorders. Linda Shopes, “Making Sense of Oral History,” *History Matters: The U.S. Survey Course on the Web*, <http://historymatters.gmu.edu/mse/oral/>, February 2002 (accessed March 9, 2009).

University of Columbia in the late 1940s. His project differed markedly from the above mentioned collections since it focused on elites – the leaders in business, the professions, politics, and social life – from the outset,⁶⁰ and as I will discuss below the elite approach has remained an important part of oral history. Soon however scholars once again turned their attention towards marginalized or neglected social groups whose voices by and large remained silent in the existing sources. The interest in recording the experiences of “ordinary” people was especially salient in Great Britain and became an important part in the “history from below” movement among politically-committed social historians from the 1960s and onwards.⁶¹ Paul Thompson, one of the movement’s leading figures and author of the pioneering book *The Voice of the Past*, understood oral history as more or less synonymous with history from below and he emphasized its emancipatory qualities.⁶² Today, however, most scholars prefer to see oral history as a method and not as a field or sub discipline (such as for instance social history).⁶³

As a method, then, oral history has above all been justified and used for giving voices to the “hidden” history,⁶⁴ but since Nevins’ project also elites have been its subjects. I would like to underline that elite oral history the last decades has had a rather different purpose. While Nevins’ approach had an almost hagiographic stance – “great” men were interviewed about great events – scholars today argue that although it is true that elites already have a voice in history sources are not always representative for how they function. These remain silent about several aspects of elites. To mention one example lobbying is rarely recorded in the written sources. Elite oral history, as well as the study of elites, is justified by the fact that elites and their activities have had considerable influence on social change. To examine different aspects of elites will increase our knowledge of how they function and exercise power.⁶⁵ Södertörn University in Sweden initiated 2004 a pilot project in elite oral history aiming at central political decision-makers.⁶⁶

I would like to mention a methodological development regarding elite oral history that has been taken place in Great Britain. Since 1986 the Centre for Contemporary British History (CCBH) has been developing witness seminars as a method for documenting the recent past.⁶⁷ These are a category of oral history methods where a number of individuals, who have participated in, and/or witnessed, a certain series of historical events, gather to discuss and debate their often different interpretations of the past events. We can thus consider them as group interviews. As a method the witness seminar is not exclusively directed towards elites, but that is how it by and large has been adopted. CCBH has for example dealt with events and processes at a political top-level such as “The Ber-

⁶⁰ Ibid.

⁶¹ Alistair Thomson, “Four Paradigm Transformations in Oral History,” *The Oral History Review* 34, no. 1 (2006), 49–70. See also Linda Shopes, “Making Sense of Oral History,” *History Matters: The U.S. Survey Course on the Web*, <http://historymatters.gmu.edu/mse/oral/>, February 2002 (accessed March 9, 2009).

⁶² Paul Thompson, *The Voice of the Past: Oral History* (Oxford, 1978).

⁶³ Soraya de Chadarevian, “Using Interviews to Write the history of Science,” in *The Historiography of Contemporary Science and Technology*, ed. Thomas Söderqvist (Amsterdam, 1997), 52; David Gaunt, “Oral history och levnadsöden,” in *Icke skriftliga källor: Huvudtema I*, eds. Anders Brändström & Sune Åkerman (Umeå, 1991), 64f; Seldon & Pappworth, 4; Tosh, 334.

⁶⁴ “Hidden” could here be exchanged with “invisible” or “forgotten” without losing its essential meaning. Birgitta Odén, “Den ‘osynliga’ historien,” in *Usynlig historie: Foredrag fra den 17. Nordiske fagkonferensen for historisk metodelære i Trondheim 19.–23. mai 1981*, eds. Bjørn Qviller & Birgitte Wählin (Oslo, 1983), 9–24.

⁶⁵ Eva McMahan, *Elite Oral History Discourse: A Study of Cooperation and Coherence* (Tuscaloosa, 1989). See also Anthony Seldon & Joanna Pappworth, *By Word of Mouth: ‘Elite’ Oral History* (London, 1983).

⁶⁶ Ylva Waldemarsson, “Politiska makthavare som historisk källa,” *Arkiv, samhälle och forskning* 2007:2, 6–23; idem, “Den redigerade källan,” *Arbetshistoria* 2008:1, 32–35.

⁶⁷ “What Is a Witness Seminar?,” www.ccbh.ac.uk/witnessseminars.php (accessed June 15, 2009).

lin Crisis”, “Britain and the Marshall Plan”, “The British Response to the Strategic Defence Initiative (Star Wars) in the 1980s”, and “Conservative Government Difficulties 1961–64”.⁶⁸ The witness seminars designed by the CCBH have become the model for similar documentation projects at a number of centers and institutes around the world. In Sweden, the Institute for Contemporary History at Södertörn University has carried out witness seminars essentially patterned after the CCBH’s. These have often, but not always, paid attention to top politicians, leading officials and prominent intellectuals as in the witness seminar on “löntagarfonder” (wage-earners’ investment funds), on “grön politik” (green politics) or on “makten i Stadshuset” (the power in the Town Hall of Stockholm). As such they may illuminate the hidden and more savory aspects of politics and policymaking as well as to highlight informal structures and political networks.⁶⁹

Related to elite oral history is the rather long tradition of conducting oral history in history of science, technology, and medicine. In these disciplines oral history has in particular been used in the study of leading engineers and scientists such as Nobel Laureates or outstanding laboratories, research facilities or research groups such as Niels Bohr’s group in Copenhagen, the Manhattan Project or the Radiation Laboratory at MIT.⁷⁰ I would like to emphasize that oral history in the history of science, technology, and medicine does not necessarily have to deal with elites. Scholars have also used oral sources as a supplement to written sources. Official records and scientific papers are not very representative for the everyday life and practices of engineers and scientists. Conversations with the historical subjects help the scholar to understand the component of “tacit knowledge” in engineering and scientific work and to grasp the often complex and complicated content that characterize recent science. Oral history may also enhance their understanding of professional identities and ideologies.⁷¹ But the main emphasis on engineering and scientific elites remains still today. Part of the explanation is the professional communities and organizations of engineers and scientists. These have been instrumental in creation of oral history archives in fields such as physics, chemistry and medicine. The American Institute of Physics (AIP) host a Center for History of Physics, which dates back to the early 1960s, and that has completed some 1,500 oral history interviews with physicists, astronomers and others.⁷² The U.S.-based Chemical Heritage Foundation (CHF) also run a comprehensive oral history program which has produced a substantial oral history collection over the years that today contain more than 400 oral history interviews with “leading scientists and entrepreneurs”.⁷³ Crossing the Atlantic the British medical research charity, the Wellcome Trust, established a Centre for the History of Medicine in 1990. As in the cases of AIP and CHF it aims to build archives and carry out

⁶⁸ Ibid.

⁶⁹ Torbjörn Nilsson, personal communication, August 24, 2007; “Vittnesseminarier: Samtidshistoriska institutet” (non-published document).

⁷⁰ Alex Soojung-Kim Pang, “Oral History and the History of Science: A Review Essay with Speculations,” *International Journal of Oral History* 10, no. 3 (1989), 270–285. See also Soraya de Chadarevian, “Using Interviews to Write the History of Science,” in *The Historiography of Contemporary Science and Technology*, ed. Thomas Söderqvist (Amsterdam, 1997), 51–70; Lillian Hoddeson, “The Conflict of Memories and Documents: Dilemmas and Pragmatics of Oral History,” in *The Historiography of Contemporary Science, Technology, and Medicine: Writing Recent Science*, eds. Ronald E. Doel & Thomas Söderqvist (New York, 2006), 187–200; E.M. Tansey, “Witnessing the Witnesses: Potentials and Pitfalls of the Witness Seminar in the History of Twentieth-Century Medicine,” in *ibid.*, 260–278.

⁷¹ de Chadarevian, 51f; Hoddeson, 187; Soojung-Kim Pang, 271ff; Tilli Tansey, “Telling like it was,” *New Scientist*, 16 December 1995, 49.

⁷² “Center for History of Physics,” www.aip.org/history/ (accessed June 10, 2009). See also “Sources for History of Quantum Physics,” www.amphilsoc.org/library/guides/ahqp/ (accessed June 10, 2009).

⁷³ “Oral History Collection,” www.chemheritage.org/exhibits/ex-nav2.html (accessed June 10, 2009); Rasheedah S. Young, “Oral History at CHF,” *Chemical Heritage* 23, no. 2 (2005), 34–35.

historical research related to the professional community. A salient feature is to create and collect oral sources, and since 1993 the Centre for the History of Medicine has held witness seminars modeled after the above mentioned CCBH's. Up to date more than 50 such meetings have been held and they have treated subjects such as "Monoclonal Antibodies", "Early Heart Transplant Surgery in the UK" and "Neonatal Intensive Care".⁷⁴ The mentioned institutions have been influential in establishing oral history as a method in the history of science, technology, and medicine.

It seems to me that there are at least two reasons for the comprehensive oral history programs in the history of science, technology and medicine. First, more than 90 percent of all science has been produced during the last half century and the majority of the scientists that have existed are still alive which makes it possible to talk with them – obviously a major advantage for the historian.⁷⁵ It would be no wild guess that this also is valid for the engineering community – although I do not possess statistics to support this statement. Second, and more important, the professional communities themselves have played an active, and even crucial, role in preserving "their" heritage to the posterity by initiating large oral history programs. Oral history in the history of science, technology and medicine thus differ from oral history in social history or political history in one important aspect: the active and often intense collaboration between the members of the professional communities and historians. Arne Hessenbruch has somewhat provocatively argued that collaboration with scientists and their like will be necessary for future historians of science.⁷⁶ As we shall see collaboration with the professional community plays a very important role also in our project.

To summarize, scholars have used oral history in order to approach three areas, or, rather, set of areas, in the historical landscape: social history or "history from below", history of elites, and history of science, technology and medicine. All of these categories aim for the "hidden" history in the sense that the existing sources do not reveal the complexity and details of these areas.

How History of Computing Has Been Documented

To what extent, how, and by whom has history of computing been documented up to the present? Which methods and tools have been used? And which aspects of the history of computing have these efforts aimed to cover? Has a user-centered perspective been taken into account? In this section I shall answer these questions by a brief survey of the major international documentation efforts.

Research and documentation in history of computing have above all been undertaken in the United States with Charles Babbage Institute (CBI) as the pioneering organization. CBI that was established in 1978 in Palo Alto, California, moved only two years later to Minneapolis. Since 1989 it belongs to University of Minnesota where its director also holds a chair. CBI hosts a small staff consisting of historians, archivists and administrative personnel. Its three core activities were from the outset the collecting of archives, manuscripts, media materials and corporate records; historical research; and oral histo-

⁷⁴ Tansey, 260f; "Wellcome Witnesses to Twentieth Century Medicine," www.ucl.ac.uk/histmed/publications/wellcome_witnesses_c20th_med (accessed June 10, 2009).

⁷⁵ Thomas Söderqvist, "Preface," in *The Historiography of Contemporary Science and Technology*, ed. Thomas Söderqvist (Amsterdam, 1997), vii.

⁷⁶ Arne Hessenbruch, "The Mutt Historian?: The Perils and Opportunities of Doing History of Science On-Line," in *The Historiography of Contemporary Science, Technology, and Medicine: Writing Recent Science*, eds. Ronald E. Doel & Thomas Söderqvist (New York, 2006), 279–298.

ries. Over the years there has been a substantial cross-fertilization between these three different areas. Oral histories has usually been conducted within research projects, and the contacts with informants that these have generated has in turn stimulated donations of archives et cetera, which in the long run has created an entire infrastructure for future research. When it comes to oral histories CBI has developed a research-grade model for conducting them. The model includes extensive research beforehand by the interviewer (four days on average for one interview), tape-recording of the usually two to three hour long interviews, and a subsequent process of transcription and editing.⁷⁷ Up to date CBI has completed more than 300 oral histories and if permitted these are published on the web. A glance at the conducted interviews shows that they mainly deal with pioneers in computing technology.⁷⁸ But during the last couple of years CBI has responded to the recent shift in the historiography towards the users of computing and non-pioneering figures, companies and nations by developing new research tools and methods such as blog-, database-, and wikibased technologies as a way to create and collect sources on the “many” users.⁷⁹

Another important institution is the IEEE History Center in New Brunswick, New Jersey. The center, which was founded in 1979, falls back on two organizations: IEEE and the Rutgers State University. I would like to stress two important aspects with this organizational solution. It help giving the IEEE History Center credibility both in academia and in the professional community of electrical engineers, and it also makes the center more economically robust since it receives funding from different trustees.⁸⁰ Like CBI it has a small staff consisting of historians, archivists and administrative personnel. The center is devoted to further the preservation, research and dissemination of information about history of electrical science and technology, and in particular it focuses on the technological and organizational history of IEEE, its members, and their professions, which means that it covers important aspects of the history of computing. Conducting, recording and transcribing oral histories belong to the History Center’s core activities, and up to date about 400 oral histories have been completed. The majority of them are available web-published. Almost all of the oral history interviews are conducted with members of the professional community of electrical engineers. Oral history as a method is very well established at the center. The oral history interviews are always carried out by professional historians and whenever it is possible in relation to ongoing research projects. Lately the center has developed a web based solution for collecting the IEEE members’ stories.⁸¹

⁷⁷ Thomas J. Misa, “Organizing the History of Computing: ‘Lessons Learned’ at the Charles Babbage Institute” (paper prepared for Conference on the History of Nordic Computing, 21–23 August, 2007, Turku, Finland); Arthur L. Norberg, “A Perspective on the History of the Charles Babbage Institute and the Charles Babbage Foundation,” *IEEE Annals of History of Computing* 23, no. 4 (2001), 12–23; Thomas J. Misa, personal communication, May 25, 2007.

⁷⁸ “Oral History Database,” www.cbi.umn.edu/oh/index.phtml (accessed June 15, 2009).

⁷⁹ See for instance the project on FastLane conducted at CBI. Misa, “Organizing the History of Computing”; Thomas J. Misa & Joline Zepcevski, “Realizing User-Centered Computer History: Designing and Using NSF’s FastLane (1990–Present)” (paper presented at the SHOT meeting, 12–14 October, 2008, Lisbon, Portugal).

⁸⁰ Also CBI was initially supported by two organizations. The Charles Babbage Foundation (CBF), an advisory and financial supporting organization consisting of corporate executives, historians, and museum staff, governed the institute together with University of Minnesota until 1989 when the university all authority for the CBI. Norberg, “A Perspective on the History of the Charles Babbage Institute and the Charles Babbage Foundation,” 20ff.

⁸¹ “IEEE Oral History Collection,” www.ieeeahn.org/wiki/index.php/IEEE_Oral_History_Collection (accessed June 16, 2009); Frederik Nebeker, personal communication, May 22, 2007.

Beside CBI and IEEE History Center a number of American institutions have done, and are doing, important documentation work. The National Museum of American History and National Air as well as the Space Museum at Smithsonian Institutions Archives in Washington D.C. hosts a large collection of artifacts and a number of oral history interviews with American pioneers in computing such as J. Presper Eckert, Douglas Engelbart, Bill Gates and Steve Jobs.⁸² The MIT Museum in Cambridge, Massachusetts, focus quite obviously on MIT, and history of computing is only treated if it is related to MIT, but the museum is worth mentioning in this matter since it holds a substantial collection of oral histories on the subject. The vast majority of these are conducted with engineers and scientists affiliated with MIT. If permitted both the Smithsonian and the MIT Museum publish the interviews on the web.⁸³

Also the Computer History Museum in Mountain View, California, which was established in 1996 and currently is the world's largest museum on the history of computing, has created and collected oral histories in form of interviews and panel discussions. These are video taped, transcribed, edited and up to date almost 200 of them are made available online. The oral histories have mainly been completed by senior practitioners from the field, and not by scholars. as at the above mentioned institutions.⁸⁴

Finally, I would like to mention a recent interesting effort, and it is the international and multicultural WiWiW project (Who is Who in the Internet World), which has carried out almost 200 oral history interviews with Internet pioneers around the world since the late 1990s. Along with interviews archive materials are also collected. Many of these interviews, like the Computer History Museum's, have been conducted and processed by a "distributed" global network of practitioners from the field. The WiWiW project has, as in the cases of the CBI and the IEEE History Center, experimented with Internet based tools for creating and collecting sources.⁸⁵

The two last mentioned examples show that there is no patented best practice on how to proceed when creating and collecting oral sources on history of computing. While CBI, IEEE History Center and others have established a successful, but time-consuming model for conducting oral history interviews that includes extensive research and preparations by scholars, alternative models cannot be dismissed a priori. It is worth to note however that all above mentioned institutions and projects have considered it necessary to transcribe and edit the conducted oral history interviews. They seem to agree that audio tapes, and even audio clips made available online, are of limited practical value for researchers.

Few similar documentation efforts can be found in Europe. A notable exception is the UK National Archive for the History of Computing in Manchester that was created in

⁸² The list is not long, but quite impressive. "Computer History Collection," <http://americanhistory.si.edu/collections/comphist/> (accessed June 10, 2009); "Oral History on Space, Science, and Technology," www.nasm.si.edu/research/dsh/oralhistory.cfm (accessed June 10, 2009).

⁸³ More precisely the Institute Archives and Special Collections and the MIT Museum holds them. "Oral History@MIT," <http://libraries.mit.edu/archives/oral-history/index.html> (accessed October 17, 2007); Deborah Douglas, personal communication, October 25, 2007.

⁸⁴ Originally Boston Computer Museum (founded 1979), but relocated to the West Coast some years later. "Oral Histories Collection," www.computerhistory.org/collections/oralhistories/ (accessed, June 10, 2009); Kirsten Tashev & Dag Spicer, personal communication, May 25, 2007.

⁸⁵ Andreu Veà, "Internet History and Internet Research Methods: Engineering the Worldwide WiWiW Project" (paper prepared for the SHOT meeting, 12–14 October, 2008, Lisbon, Portugal); "WiWiW project," wiwiw.org/ (accessed June 15, 2009).

1987. As its American peers the archive also focuses on archival collections, oral histories and research in the history of computing, although the task to document oral sources has been very much subordinated to its other activities.⁸⁶ In Sweden, the museums are the organizations that traditionally have initiated and led documentation projects, but on the whole history of computing has not been favored. To my knowledge only two Swedish museums have paid interest to the subject. The first one is the National Museum of Science and Technology in Stockholm, which inaugurated their first exhibition on computers in 1978, and the second one IT-ceum, a regional museum exclusively devoted to the history of computing that was established in 2004 in Linköping. But none of these two museums have carried out any systematic documentation of the history of computing on their own.⁸⁷

How can the apparent lack of European efforts to document the history of computing be explained? I believe two reasons should be considered at first hand. To begin with oral history as a method has led a rather obscure life in Europe (with the possible exception of Great Britain) compared with the United States. It is only during the last couple of decades that European scholars have begun to create and collect oral sources in a more systematic fashion. Perhaps of more importance, and as I have touched upon earlier, the historiography of computing show an overwhelmingly bias towards pioneers in computing technology, and consequently towards the United States since the majority of the computing technology were developed there. My guess is that the low interest in Europe to document history of computing simply is a reflection of this bias. Why document the development of computing technologies whose impact only have been marginal? Although such efforts could easily be justified intellectually (failed technologies are as interesting for the scholar as successful ones), it is not difficult to imagine that the interest from the national archives and museums as well as the public in the “non-pioneering” countries for such a prospect would be lukewarm at the most. With the shifting emphasis from pioneers and nation-centered history to users and transnational processes in the recent historiography, however, the interest will probably increase.

In summarizing the main findings of this section extensive documentation efforts in history of computing have in particular been carried out in the United States, and these have above all dealt with (American) pioneers in computing technology. Even if the picture is beginning to change, as the example of CBI shows, the user-centered perspective is by and large absent. The method par préférence under nearly three decades has been the oral history interview. This should come as no surprise since the method has proved very well suited for in depth studies of key persons. The examples given in this section also indicates that oral history is transforming – Alistair Thomson even talks about a paradigmatic revolution⁸⁸ – as it enters the “digital” era. Many of the above mentioned institutions and projects use the web to increase the accessibility of their collections, and they

⁸⁶ John Pickstone & Geof Bowker, “The Manchester Heritage,” *IEEE Annals of the History of Computing* 15, no. 3 (1993), 7–8; Geoffrey Tweedale, “The National Archive for the History of Computing,” *Journal of the Society of Archivists* 10, no. 1 (1989), 1–8; “UK National Archive for the History of Computing,” www.chstm.manchester.ac.uk/research/nahc/ (accessed June 10, 2009); James Sumner, e-mail, June 19, 2009. There are also a number of pilot projects carried out in other European countries. The research project “Information Technology in Finland after World War II: The Actors and Their Experiences” that was completed between 2002 and 2005 collected for instance 744 stories with the help of an Internet questionnaire. Satu Aaltonen, “Tunteita, tulkintoja ja tietotekniikkaa: Milloin kuult ensimmäistä kertaa tietokoneista?” -kyselyn tuloksia” (Turku, 2004), 21; Petri Paju, e-mail, June 22, 2009.

⁸⁷ *Dadalus 1978/79: Tekniska museets årsbok* (Stockholm, 1978–79), 171; “IT-ceum: Det svenska data-museet,” www.itceum.se/ (accessed June 15, 2009).

⁸⁸ Thomson, 68–70.

also experiment with information technology in order to find novel and innovative tools and methods for creating and collecting oral sources and the like. This recent trend, which in part is spurred by the shift in the historiography towards the user and technology in use, has especially been visible during the latter part of our current decade.

Documenting History of Computing from an (Elite) User Perspective

As I argued in the introductory section a user perspective on IT-history implies a shift of focus from the “few” pioneers to the “many” users. And the discussion so far has taught us that research tools and methods must be adapted to the historical questions and themes that we are interested in. That we have chosen to document history of computing from an elite user perspective implies that we cannot solely rely on the methods that have been used by the above mentioned international efforts, since they mostly have developed and refined these for the task to document pioneering figures.

But with which methods do we approach the elite user? Quantitatively the elite user occupy some kind of middle ground between the “few” pioneers and the “many” users. They are neither that few nor that many. Methodologically they can therefore still be approached with the help of the “classical” oral history interview. But new methods are also needed. Since the methods for approaching users are still developing we have decided to experiment with various methods at the same time.

This is a part of the explanation. But the choice of methods (and organization) is also the result of negotiations between the project’s three participating parties: the Swedish Computer Society, the Division of History of Science and Technology at KTH and the National Museum of Science and Technology. Therefore the history and particular circumstances that shaped the project must be considered, to which now we turn.

A Project Evolves

I have argued for the necessity of the project from a scholarly point of view. If we want to understand how computing changed the world, we need to address the user, and the uses, of computing technology, and therefore we need sources on these actors, and these events and processes. But beside these scholarly criteria the project was also shaped by *non-scholarly* criteria. These may be divided in factors *internal* and *external* to the project. Among the internal factors that affected the outcome were the choice of organization, the participating parties (organizations as well as individuals) and the work process. Among the external were funding, conditions for grants (*anslagsvillkor*), and perhaps, most important, that the first generation of IT-actors were, and still are, passing away. In this section I shall consider the role of these factors in shaping organization and methodological approach as well as the type of sources collected and created by giving an account of the history of the project. The outcome has to be understood as a trade-off between different, and sometimes conflicting, interests.

The project has a history that traces back to 2002, when the first networks of senior practitioners with an interest in IT-history were formed at the Swedish Computer Society. These groups of seniors originally aimed for writing a Swedish IT-history and they approached a number of interest organizations, museums and universities in an early stage with this purpose. Among these were IT-ceum, IT-företagen, the Museum of Work (*Arbetets museum*), the Royal Swedish Academy of Engineering Sciences (*Kungl. Ingenjörsvetenskapsakademien, IVA*) and Nordiska museet. A steering group with a couple of senior

practitioners and representatives from the above mentioned organizations was formed in 2003. The senior practitioners also formed small networks, so-called focus groups, interested in certain branches or technologies, so-called focus areas. Four focus groups were established during 2004: financial industries, healthcare, hardware and software (later renamed early computers), and systems development. The same year the steering group initiated discussions with the Division of History of Science and Technology at KTH and the National Museum of Science and Technology. Scholarly discussions on theoretical approach and methodology started. The idea that documentation of the Swedish IT-history must be a first step towards writing a Swedish IT-history now began to take shape, and eventually it was concluded that this should be the main objective of a joint project with the Swedish Computer Society, the Division of History of Science and Technology at KTH and the National Museum of Science and Technology as participating parties. The *raison d'être* for such a project was formulated in a straightforward manner: people were passing away.

The senior practitioners in the focus groups made the first documentation efforts. They carried out a number of interviews with each other, but without following the established practice in oral history to record them at first hand (or make careful notes at second hand). Inspired by the curators at Nordiska museet the members in one focus group also decided to write their own autobiographies, but it resulted in no more than a half-dozen autobiographies. Although the outcome of these first steps may seem poor at first glance, they nevertheless were important since they forced the participants to reflect over methodology. It became clear that interviews must be carried out in another manner and that autobiographies, given the low percentage of answers, has to be collected at a large scale.

Meanwhile the first steering group was dissolved in 2005 and replaced with a new constellation with representatives from museums, trade and industry, and universities. With initial grants from the Bank of Sweden Tercentenary Foundation, the Marcus and Amalia Wallenberg Memorial Fund and the Knowledge Foundation the constellation carried out a number of oral history interviews and witness seminars under scholarly guidance during 2005 and 2006. Together with the first steps taken by the focus groups these experiences gave important methodological insights, but highlighted above all the need for a robust organization. How should the material be gathered, processed, administrated, and disseminated? And by whom? By the senior practitioners or by scholars or by museum curators? Who should be responsible for the project? And who should lead and oversee the work?

With a research program written by the participating scholars the project managed to obtain funding from the Bank of Sweden Tercentenary Foundation and the Marcus and Amalia Wallenberg Memorial Fund at the end of 2006. The research program argued for a user-oriented approach when documenting history of computing. In a sense this choice fell out natural since the Swedish Computer Society has been a user organization since it was founded in 1949. In the mean time focus groups in the areas of defense, manufacturing industries as well as user organizations and user participation had been established during 2005 and 2006.⁸⁹ Since the project had grown quickly in both scale and scope, the achieved funding was limited to a year period, and the documentation efforts had to start as soon as possible since the historical actors were passing away, it became acute to solve the organizational problems.

⁸⁹ The name 'user organizations and user participation' may in retrospect seem confusing since the whole project has a user perspective, but when the focus group was established the project had not yet decided its direction.

The steering group identified especially two potential organizational threats to the realization of the project. First, the collaboration consisted of three parties with, to say the least, different organizational cultures and aims. There are few Swedish examples, if any, on successful collaborations between museums, trade and industry, and universities. Second, the collaboration contained senior practitioners from the field working on a non-profit basis on the one hand, and professional scholars and museum curators working on profit basis on the other. International documentation efforts by organizations such as CBI and IEEE History Center have indeed shown the importance of co-operating with practitioners, but have also made it clear that a project has to be very careful in not relying too much on the efforts made on non-profit basis when it comes to meet time schedules and delivering products.⁹⁰

After intense discussions the steering group decided that these potential threats should be solved through a meticulous design of the project's organization and work process. Making the organizational structure and the different parties' responsibilities explicit from the beginning, it was argued, would remove many potential pitfalls in organization and chain of command and thus minimize possible misunderstandings between the three participating parties. It would also clarify the different roles of those individual participants working on a non-profit basis and those working on profit basis. It would furthermore make it easier for individuals to enter (and to leave) the project. A formal description of the organization, the work flow and the different participants' responsibilities was therefore elaborated at the beginning of 2007. It was presented in a Project Manual, together with descriptions of the methods applied. The Project Manual was distributed to all project members and its content was discussed with them at a specially designed workshop during the spring of 2007. The purpose was to get the project and the more and less autonomous focus groups to go in the same direction. The general organization, the agreed upon deliverables and the structure of the work process for each focus area are described in Appendix III: Formal Description of Organization and Work Process.⁹¹

Methods

Knowledge Outlines

Knowledge outlines are a part of the work that consists of drawing a course map over the landscape of the past. The purpose of knowledge outlines is to give a guide for the principal task of creating and collecting source material. Which parts of the past should be documented and why? If there, for instance, are abundant written sources on the events and processes in a certain part of the past, it becomes less important to create and collect complementary oral sources. If, on the other hand, the events and processes have left no traces, or few, in the existing archives, it becomes more important to create and collect new sources about precisely these events and processes. However, an unexplored area in the landscape of the past is, at the same time, not a sufficient reason to start documenting. Such a project will easily become insurmountable. There are many unexplored areas. The documentation efforts should, therefore, ideally be linked to those problems that have been observed by earlier historical research on the given part of the past, and also, the role of the knowledge outline is to identify these. Thus, the compilation of knowledge outlines consists of two stages. In the first place, to get a picture of

⁹⁰ Frederik Nebeker, personal communication, May 22, 2007; Thomas J. Misa, personal communication, May 25, 2007.

⁹¹ Parallel with the work on organization methodology was discussed ...

the existing historical research dealing with a focus area, and, in the second, to identify existing sources by compiling bibliographies and listing relevant archives. If carried out as described, the knowledge outlines will become an important preparatory work for the documentation efforts to follow.

Oral History Interviews

Interviews are a method for creating oral sources that have been used extensively for decades, and we drew particularly upon the experiences of the Charles Babbage Institute (CBI) in Minneapolis and the IEEE History Center in New Brunswick, since they have interviewed IT-actors since the beginning of the 1980s.⁹² One should emphasize that in many aspects oral history interviews differ from, for instance, job interviews or newspaper interviews. One aspect is the “best-before date”. While a job interview has a best-before date of, say, three weeks, an oral history interview is required to last for at least fifty years. Another is the amount of preparation. The value of the oral history interview depends very much on the preparations, the purpose, and the questions, how the interviewer carries it out, and how it is documented. The interview can be more or less formalized regarding the questions posed, how careful the interviewer follows a questionnaire, which has been devised beforehand and how the interviewee’s answers are dealt with and are followed up.⁹³

I would like to underscore that a crucial difference between oral and written source material is that the former is *created* in the meeting between the interviewer and the interviewee, which means that the conduct and questions of the interviewer affect the outcome of the interview. This so-called interviewer effect makes it important to take a critical stance vis-à-vis the problems that occur when researchers and actors actively create source material together.⁹⁴ A way to facilitate source criticism is to preserve the different steps in the processing of oral sources (recording of sound and images, transcript, and edited transcript). In the project “From Computing Machines to IT,” we preserved material from all these steps in our work with oral sources at the National Museum of Science and Technology.

The interviews conducted in our project were recorded with sound in digital format and then transcribed. The research secretaries then edited the transcript regarding readability and comprehension. At the same time, they aimed at keeping the transcript’s oral character. Before making the edited transcripts available on the web, the interviewees had the chance to clarify, correct, or comment on their contributions. Minor changes such as corrections of names, dates, and technical concepts were inserted in the transcript without comments. In individual cases, the research secretaries added sentences or subordinate clauses, as suggested by the interviewee, to make lines of thought or conversations more complete. Furthermore, we included extensive comments from the interviewee using addenda. The interviews are typically between one to three hours long and the edited transcripts roughly between fifteen and forty-five pages.

⁹² “Charles Babbage Institute’s Collections,” www.cbi.umn.edu/oh/ (accessed October 21, 2008); “IEEE Oral Histories,” www.ieee.org/web/aboutus/history_center/oral_history/oral_history.html (accessed October 21, 2008).

⁹³ Frederik Nebeker, personal communication, May 22, 2007; Thomas J. Misa, personal communication, May 25, 2007.

⁹⁴ Robert Perks & Alistair Thomson, eds., *The Oral History Reader*, 2nd ed. (New York, 1998).

Witness Seminars

The Centre for Contemporary British History (CCBH) has since 1986 been developing and using witness seminars as a documentation method in its research.⁹⁵ Witness seminars are a category of oral history methods where a number of individuals, who have participated in, and/or witnessed, a certain series of historical events, gather to discuss and debate their often different interpretations of the past events. Thus, we can consider them as group interviews. The witness seminars designed by the CCBH have become the model for similar documentation projects at a number of centers and institutes around the world. The Institute of Contemporary History at Södertörn University in Sweden, for instance, has carried out witness seminars patterned after the CCBH's. These seminars have dealt mostly with political history such as the women's liberation movement during the 1960s and the 1970s or the debate on industrial democracy during the 1970s and the 1980s.⁹⁶ However, the questions and themes addressed by historians of science and technology are in many cases distinct from the ones studied by political historians. We were thus confronted with somewhat different methodological questions and aspects, and we, therefore, chose to model our witness seminars on the meetings that the Wellcome Trust Centre for the History of Medicine has been arranging since the 1990s, because they have been concerned with similar methodological questions and problems that we were faced with: How does one get hold of scientific and technical practice and the tacit knowledge embedded in it? How does one deal with sources that contain complex scientific and technical reasoning?

In the experience of both the CCBH and the Wellcome Trust, witness seminars, when compared to particular interviews, stimulate an entirely different interaction between the participants. The meeting becomes a sort of collective recollection. But they also point out that the method has some obvious disadvantages. The lineup of participants is critical to the outcome of the seminar. If potential witnesses are unable or unwilling to participate, there is not much one could do. There is also an inherent risk that conflicts may be suppressed and that dissentients are not able to make their voices heard, with too "streamlined" recollections as a result. Another danger is that the reminiscences may be too anecdotal; a feature witness seminars, of course, share with other forms of oral history.⁹⁷ Overall, a witness seminar can serve to highlight different interpretations of an event and thereby contribute to a deeper understanding of the complexity of historical processes.

The witness seminars we held were processed them roughly in the same way as the oral history interviews with three important exceptions. Firstly, we recorded them with both sound and images. Secondly, we added explanatory footnotes to the edited transcripts. The footnotes contain biographical information about persons as well as descriptions of subjects mentioned during the seminar. The research secretary worked on the footnotes in close cooperation with the participants, and they, therefore, function as complementary source material. Thirdly, the edited transcripts were published both in print and electronic versions. Our witness seminars normally span over three to four hours and the edited transcripts are about forty to fifty-five pages long.

⁹⁵ "Centre for Contemporary British History's Witness Seminars," <http://icbh.ac.uk/icbh/witness/welcome.html> (accessed October 21, 2008).

⁹⁶ Lars Ekdahl, ed., *Löntagarföndsfrågan: En missad möjlighet?* (Huddinge, 2002); Elisabeth Elgán, ed., *Kvinnorörelsen och '68: Aspekter och vittnesbörd* (Huddinge, 2001).

⁹⁷ E.M. Tansey, "Witnessing the Witnesses: Potentials and Pitfalls of the Witness Seminar in the History of Twentieth-Century Medicine," in *The Historiography of Contemporary Science, Technology, and Medicine: Writing Recent Science*, eds. Ronald E. Doel & Thomas Söderqvist (New York, 2006).

Picture 1. The project “From Computing Machines to IT” held its first witness seminar in September 2005. The theme for the seminar was “Working with the Computing Machines of the 1950s” and it was moderated by Lars Arosenius (not on the picture). From left to right: Carl-Ivar Bergman, Bengt Beckman, Hans Riesel, Elsa-Karin Boestad-Nilsson, Erik Stemme, Gunnar Stenudd, Bert Bolin and Gunnar Wahlström.

Autobiographies

Autobiographies are an effective and laborsaving way to collect the actors’ experiences. A model for us was the collections of autobiographies that ethnologists at Nordiska Museet in Sweden have carried out, systematically, since the 1940s. They did them with the help of detailed questionnaires and aimed at occupational groups of various kinds. The questionnaires were sent out *en masse* by mail or announced in the media. The result is a rich documentation of different work cultures in twentieth-century Sweden.⁹⁸ For instance, the museum has published a selection of the collected life stories of engineers in the volume *Framtiden var vår* (The Future Was Ours). The autobiographical material gives a comprehensive and nuanced picture of the engineering profession and its role in Swedish society.⁹⁹ The method has several advantages. It is effective and timesaving. Furthermore, it makes it possible to collect large amounts of material. There are no direct intermediaries such as in interviews, and the material, therefore, becomes autobiographical in a unique sense. Nevertheless, it is also important to be aware of the drawbacks. These include certain individuals who had difficulty expressing themselves in writing; some choose not to participate; the collected written material may appear too carefully prepared and revised.¹⁰⁰

Picture 2. The project’s call for autobiographies in the journal *Ny teknik*, no. 18, 2 May 2007.

We collected about 190 autobiographies through different notices that featured between April and June 2007 in the daily press, specialist press, trade union press, and on the television. We wrote some of these notices for the general public; we aimed others toward specific occupational groups such as metalworkers, nurses, and doctors.¹⁰¹ While the oral history interviews and witness seminars we have carried out paid attention to “elite” users, the collection of autobiographies provides a more representative picture of IT-users in Sweden between 1950 and 1980. Among the collected stories, we also find those by secretaries and operators. A measure of diversity is the number of participating women. In the interviews and seminars we carried out, the share of women was only 7 percent while it was 21 percent in the collection of autobiographies.

Picture 3 With the call for autobiographies we were able to reach the “end” user, which often was a woman. The office worker Ingeli Åkerberg with the word processor Wordplex at the end of the 1970s.

Writers’ Web

In the project “From Computing Machines to IT,” we also developed tools for collecting autobiographies over the internet as an alternative to the “traditional” way described above. At least one similar attempt occurred internationally, although the outcome of this pioneering work was rather poor. One explanation is that the virtual platform developed

⁹⁸ See Sune Åkerman, “Mjukdata,” in *Usynlig historie: Foredrag fra den 17. Nordiske fagkonferensen for historisk metodelære i Tranum Klit 19.–23. mai 1981*, eds. Bjørn Qviller & Birgitte Wählin (Oslo, 1983), 53ff.

⁹⁹ Dan Waldetoft, ed., *Framtiden var vår: Civiingenjörer skriver om sitt liv och arbete* (Stockholm, 1993).

¹⁰⁰ Charlotte Hagström & Lena Marander-Eklund, eds., *Frågelistan som källa och metod* (Lund, 2005).

¹⁰¹ Include our questionnaire.

was too complicated.¹⁰² We considered this experience when developing our Writers' Web—a simple virtual platform based on the questionnaires we used for the collection of traditional autobiographies. At the Writers' Web, which has the URL <http://ithistoria.se>, the visitors are invited to write down their memories in the form of autobiographies. It is also possible for them to upload files of different kinds, for instance pictures. We, furthermore, provided the Writers' Web with a function that allows the visitors to comment on earlier uploaded contributions, and thus makes an interaction between the platform's visitors possible.

However, the Writers' Web was not as successful as our traditional collection of autobiographies. As of 2008 October, about forty life stories and comments appear at the Writers' Web. One explanation is that we did not combine the launching of the Writers' Web with nationwide notices. Another is that there are large variations in the familiarity with the internet among people with memories from the period between 1950 and 1980, depending on the professional, social, and cultural background. It is simply not possible to reach everybody with this kind of method.

Picture 4. The project launched its Writers' Web in June 2007. The picture shows the homepage for the Writers' Web.

Choosing Method

The presentation and discussion of methods so far show that each of them has its pros and cons. A routine-like application of any method entails a risk of collecting material of less value for scholars. I would like to emphasize the necessity of reflecting over which method is most suitable in relation to the events and the processes documented. The relation between the methodological approach and the stories one wants to collect is crucial. Depending on what is required, this relation may be more or less formalized, structured, or guided. Is it the actors themselves or the historical events and processes of which the actors only constitute a small part that are the focus of the documentation efforts? For us, it was important to find a balance between the isolated autobiography and the “technobiography,” i.e. the biography of the technology in question.¹⁰³

The work carried out in the project “From Computing Machines to IT” has led me to the conclusion that the interaction between the practitioners and the research secretaries in the focus groups was decisive for shaping the outcome of the documentation efforts. The practitioners taking part in the focus groups had, on the one hand, a comprehensive and profound *understanding* of the historical events because they had been *close* to them, while they, at the same time, had difficulty contextualizing and valuing the events precisely because of their involvement in them. The research secretaries, on the other hand, had as trained historians an ability to see the events as a part of *a greater whole*, precisely because of their *distance* to the past events. This interaction was also important in order to avoid so-called Whig history, that is, a history of the winners, since the networks that the focus groups emanated from in many cases represented the established actors.

¹⁰² Arne Hessenbruch, “The Trials and Promise of a Web-History of Materials Research,” in *The Science–Industry Nexus: History, Policy, Implications*, eds. Karl Grandin, Nina Wormbs & Sven Widmalm (Sagamore Beach, 2004), 397–413; idem, “The Mutt Historian?: The Perils and Opportunities of Doing History of Science On-Line,” in *The Historiography of Contemporary Science, Technology, and Medicine: Writing Recent Science*, eds. Ronald E. Doel & Thomas Söderqvist (New York, 2006).

¹⁰³ Flis Henwood, Helen Kennedy & Nod Miller, eds., *Cyborg Lives?: Women's Technobiographies* (York, 2001).

Created and Collected Sources

In this section I will give an account of the source material that the participants in the project “From Computing Machines to IT” created and collected. It consists of autobiographies, oral history interviews, witness seminars, Writers’ Web entries, and finally archives, artifacts, pictures and the like. Complete lists of the different types of source material are found in Appendix I: List of Source Material.

Two types of calls for autobiographies were made in the project: a general call and a number of focused calls. The project’s research group completed the general call for autobiographies in collaboration with the National Museum of Science and Technology and Nordiska museet, and the call resulted in 249 answers consisting of 1,461 pages of text in total. Of the answers 190 were considered as autobiographies. The remaining answers consisted of material lacking autobiographical qualities (queries et cetera). The 129 autobiographies, for which we have the autobiographer’s permission, are available electronically at the National Museum of Science and Technology’s web page www.tekniskamuseet.se/it-minnen. The remaining autobiographies are deposited in the museum’s archival collections and are available for researchers only.

Several of the focus groups did separate calls for autobiographies in addition to the general call. These were first of all directed towards the senior practitioners in the focus group in question as well as people in their networks. The resulting 24 autobiographies consist of 534 pages of text in total. The 6 autobiographies, for which we have the autobiographer’s permission, are available electronically at the National Museum of Science and Technology’s web page: www.tekniskamuseet.se. The remaining autobiographies are deposited in the museum’s archival collections and are available for researchers only.

The research secretaries (and in certain cases the senior practitioners participating in the focus groups) completed in total 166 oral history interviews. 153 of the interviews were recorded with sound in digital format, transcribed and edited; 7 of them were recorded with sound in digital format, transcribed, but not edited; 6 of them were recorded with notes only. The resulting recordings and transcripts are all deposited in the National Museum of Science and Technology’s archival collections. The interviews are typically between one to three hours long and the edited transcripts roughly between fifteen and forty-five pages. The 153 edited transcripts consist of 3,905 pages of text in total. The **127** edited transcripts, for which we have the interviewer’s/interviewee’s permission, are available at the National Museum of Science and Technology’s web page: www.tekniskamuseet.se/it-intervjuer. The remaining transcripts (edited or not edited) are deposited in the museum’s archival collections and are available for researchers only.

The research secretaries and the senior practitioners in the focus groups furthermore arranged 47 witness seminars. 45 of them were recorded with both sound and images in digital format, while 2 were recorded with sound only. All of the seminars were transcribed and edited. The resulting recordings and transcripts are deposited in the National Museum of Science and Technology’s archival collections. The witness seminars normally span over three to four hours and the edited transcripts are about forty to fifty-five pages long. The 47 edited transcripts consist of 2,417 pages of text in total. All transcripts were edited, and 44 of them published both in print and electronic versions (2,271 pages of text). The electronic versions are available in KTH’s working paper series TRITA-HST at the Academic Archive On-line (DiVA): www.diva-portal.org. The remaining three are available electronically at the National Museum of Science and Technology’s web page: www.tekniskamuseet.se.

In addition to the call for autobiographies the research group developed a virtual platform, Writers' Web, with the URL <http://ithistoria.se/>. 27 autobiographies and 17 comments to these were posted at the Writers' Web site between May 2007 and February 2009. All these entries are available at the web site <http://ithistoria.se/>, which is hosted by the Swedish Computer Society.

Picture 5. The collection of autobiographies, interviews and witness seminars generated several donations of archives, artifacts, pictures and the like. The picture shows a document dated June 1, 1960, from the Royal Board of Roads and Water Building that describes the role of computing machinery in the planning and construction of roads.

Additional Material

Beside the created and collected source material described in the previous section the participants in the project produced material that primarily serves to contextualize the documentation efforts. This consists of knowledge outlines, final reports as well as papers and publications on the project produced *within* the project. Complete lists of the different types of additional material are found in Appendix II: List of Additional Material.

As mentioned earlier the research secretaries completed knowledge outlines as part of their preparatory work for the documentation efforts to follow. The 18 knowledge outlines carried out in the project have the character of research notes. We have therefore decided not to make them available online. Instead they are deposited in the National Museum of Science and Technology's archival collections where they are available for researchers only.

The research secretaries summarized the documentation work carried out in each and every focus group in a final report, where they discuss which criteria that were decisive for the choice of documentation efforts. In the report they also give an account of the planning and realization of interviews and witness seminars, and discuss the editing and publication process. Finally, they identify the possible additional documentation work that would be desirable to do in the focus area, and they suggest how the created and collected material could be used for research. There are 21 completed final reports for the 16 focus groups. The reports are available electronically at the National Museum of Science and Technology's web page: www.tekniskamuseet.se.

The project has been presented at seven academic conferences (three national and four international) and at seven other occasions. It is also described and discussed in three publications (one national report, one national article, one international article).

Administration and Dissemination of Results

[This section will be based on the planning and construction of the web site <http://ithistoria.se/>.]

International experiences indicate that the difference in accessibility between material being deposited in archives and available through requests or archive visits only, and material being available online may be up to several magnitudes. Before the oral history interviews were made available online the IEEE History Center had 20 to 40 requests per year from people who wanted to consult their edited transcripts. The center does not have download statistics for online material, but the figures can nevertheless be com-

pared with CBI's download statistics of approximately 6,000 downloads annually.¹⁰⁴ It is therefore essential to make sure that the material is available online, and that it also is easy to find and to search.

Conclusions

This concluding part is divided into two sections. In the first section I discuss the organization of the project "From Computing Machines to IT," and I suggest that the work in the project not only has resulted in the development of methods and the production of sources, but also in the development of a project model for co-operation between museums, trade and industry, and universities. I also consider the possibility of a more permanent form of organization. In the second section I discuss the experiences on methods and tools we have made in the project. I especially emphasize the collaboration between historians and practitioners and I argue for the importance of creating events where practitioners are given the chance to gather for discussing and remembering their historical past and at the same time socialize.

Observations on Organization

My first observation is that the project has evolved "organically," and that this historical process has led to a mutual shaping of methods, organization, and theoretical approach. The reason for emphasizing this is because it has to a large extent formed the resulting collection of source material. Thus organization has to be considered when discussing and evaluating methodology, theoretical approach and the created and collected sources. I will illustrate this with two examples.

That the Swedish Computer Society, a user organization, was a party instead of for instance *Datasaabs vänner* (*Friends of Datasaab*), an informal club focused mainly on hardware, aroused the researchers interest for the project because they saw the possibility of exploring and developing a user perspective on the history of computing. It was furthermore not without importance for the chosen approach on "elite" users that the National Museum of Science and Technology, with its long history of co-operating with engineers and engineering industry, was a party instead of, for instance, Nordiska museet or the Museum of Work with their preeminent focus on skilled and unskilled labor. The choice of user perspective legitimized and cemented in turn the organization of the project in focus groups and focus areas – an organizational form that went hand in hand with the Swedish Computer Society's organizational culture.

Addressing users and technology-in-use also implied an empirical focus on the use of computing technology in different sectors and areas instead of the traditional focus in history of computing on hardware and software. What was required from the participating researchers was therefore a historical understanding of these sectors and areas rather than of computing technology. As a result the project chose to enroll scholars specialized in the history of the focus areas (defense, financial industries, health care, transports et cetera) rather than in the history of computing.

My second observation is on the choice of project as overarching organizational form. Even if it has become more common to carry out documentation in form of projects the choice is far from obvious. The international documentation efforts in history of computing that I surveyed in Part I have overwhelmingly been accomplished by single institu-

¹⁰⁴ Misa, "Organizing the History of Computing"; Nebeker, personal communication, May 22, 2007.

tions (although these sometimes have been backed by several trustees).¹⁰⁵ The institution as organizational form is in many aspects the ideal solution. It guarantees permanence and facilitates long-term planning. The work can be done by a small staff over a long time. It is possible to relate the documentation to ongoing research. CBI and IEEE History Center have for instance carried out oral history interviews for almost 30 years and can afford to spend up two years, including lead times, to process an interview. This obviously secures competence and quality.

But the conditions we were facing were strikingly different. In comparison with CBI and IEEE History Center we started 25 years late and it was not possible for us to build competence and conduct the interviews and the witness seminars in relation to research. Since the historical subjects were becoming older and increasingly fragile the task to create and collect sources was urgent. Another constraint was that our funding was limited in time. We were thus set with the task to accomplish a large-scale documentation of the use of computers in Swedish society during a limited time period. It was therefore not possible to blueprint the American solutions and decided therefore to choose the project as organizational form. Because of the constraints we had to involve many people during a short time period. The majority had not worked with documentation before and training became an important part of the project. Therefore we arranged an introductory workshop that was followed up with frequent working meetings. In order to get the research secretaries familiar with the interview situation we used auscultation. The many activities needed requirements on steering and control. We saw it as necessary to formalize. Here we drew on the long experience of large projects that the several of the members in the steering group had from trade and industry. What we did was to develop a project model.

I believe this formalized approach has been a necessary measure given the many organizations and participants involved. It has made it possible for them to plan and predict their work. It has made the project less vulnerable and less dependent on critical persons. It has been a way to cope with the many uncertainties. A drawback of this formalized approach is of course that there has been limited space for improvisation, i.e. for following up unexpected or newly discovered threads such as witnesses that we were not aware of and even focus areas that we did not consider when planning the project (the energy sector is one such example). This has been true both on project's level and the individual research secretaries' and focus group's level. A solution for coming around this rigidity in approach could be to allocate resources for taking possible urgent measures (*brandkårsutryckningar*).

I would like to suggest that the organization of the project, even if it is an outcome of particular and historical circumstances, could serve as project model for carrying out documentation of historical events, processes and things in the future. The design of organizational bodies, the explicit delegation and distribution of responsibilities, and the structured work process would be certainly be of great value for other two- or tripartite collaborations with similar objectives.

But why recommend a collaboration between two or three parties at first hand? Why should not a single institution carry out all the work? Let me give a couple of reasons. First, the Swedish research foundations have started to distinguish between documentation and research. This development is due to a professionalization and demarcation of

¹⁰⁵ These institutions have of course realized the documentation in form of projects but then within the existing organization.

the work carried out by academia on the one hand, and archives, libraries and museums on the other. Thus academia have become less inclined to carry out documentation and archives, libraries and museums less inclined to carry out research.¹⁰⁶ But research is often needed for documentation and vice versa. Collaboration between academia and archives, libraries and museums is therefore desirable, perhaps even essential, when it comes to documentation. Second, as I will discuss in more detail in the following section, documentation projects will most likely be more successful if they from the beginning involve the subjects whose memories are to be documented. There are of course certain risks in such collaborations, but based on our experiences I would argue that the gains are far higher than the losses.

As I have argued above the project as organizational form has been useful, and probably necessary, for carrying out documentation on a large-scale during a short time period, and similar documentation efforts in the future will most likely have to face similar challenges. Nevertheless, the project as organizational form has an obvious drawback when it comes to preservation of the created and collected sources – it is supposed to end at a certain date (in our case December 31, 2008). Thus projects in contrast to institutions such as archives, libraries and museums cannot guarantee permanence. The question of making the project permanent in form of an institute or a foundation therefore arises. There are a number of reasons. First, the existing institutions such as the National Museum of Science and Technology have difficulties to receive and administer new collections since their old collections need all available resources. Second, the experiences made, the existing knowledge gathered, and the personnel involved could be reused to a certain sense. Third, and related, the administration of the gathered material could be secured and the collections eventually extended and made on a long-term basis. Fourth, researchers using the material could be associated to the institute thus linking the processes of documentation and historical research to each other.

Observations on Methods

Methodological innovations and practices have, from the perspective of the project, taken place on a micro-level and on a macro-level. Innovations and practices on the latter level have been shaped to a larger extent by organization and theoretical approach than innovations and practices on the former.¹⁰⁷

Even if the ensemble of methods applied was decided and fixed at roughly the same time as the project went large scale, i.e. at the beginning of 2007, there were still plenty of room for the participating research secretaries to experiment with oral history interviews and witness seminars within the given format. Thus, there are several observations on method to be made on the micro-level. The extent of preparations, the skills of the interviewer, arrangements and techniques, and the interplay between interviewer and interviewee do vary from situation to situation. Each and every interview or seminar is a unique event. It is therefore difficult, perhaps impossible, to recommend a best practice on how to make oral history. Methods have to be adapted to the specific circumstances, to the abilities of the interviewer and not least to the subject of the interview (or the

¹⁰⁶ There are of course exceptions from this general trend. See for instance Marie Lennersand, "Historikern som arkivarie," *Arkiv, samhälle och forskning* 2008:2, 62–66.

¹⁰⁷ As I will discuss more thoroughly in the following section this mutual interdependence also affected the choice of methods. A user perspective implies a shift in empirical focus from the "few" pioneers to the "many" users, which in turn calls for the adoption and development of new and innovative methods such as witness seminars and collection of autobiographies.

seminar). Recognizing this we designed the project to be, in a sense, a methodological experiment from the beginning to the end.

When it comes to oral history interviews and witness seminars my conclusions on methodology are very much in accordance with those in the literature. The following observations are attempts to generalize from the particular material we have gathered. As always when making generalizations there are exceptions to be found, we simply have to acknowledge the fact that reality is more complex than the most sophisticated model or theory, but it is the overarching features that counts.

While surveying the oral history interviews carried out I have made five observations. The first one stems from the question whether the senior practitioners themselves or scholars should conduct the interviews. Of the 166 interviews completed in the project senior practitioners were involved in 31 of them. Often it was the case that the informant was an old colleague, which meant that the interviewer and the interviewee belonged to the same social network and shared similar experiences. Since they had much in common with the informant it makes it difficult for them to pose critical questions. What the historian and the posterity find interesting is often mere truisms for them.¹⁰⁸ They rather analyze the past than collect sources on it. Unfortunately many of those interviews proved to be of limited value.

The second observation is rather straightforward. Interviews need to be well prepared and the questions open-ended. Since our documentation efforts were not linked with an explicit research program the knowledge outline became an essential tool for the research secretary to get acquainted with the focus area.

The third observation has to do with the question of active or passive interviews. My conclusion is that active interviews are better than passive interviews, but only if the interviewee are well-prepared and has a good knowledge of the field. An active interview by an interviewee not sensitive and aware of the many nuances and empirical details will be of limited value. The interviewee is in a sense *missing the point*. Then a passive interview, albeit unstructured, will be of more value. This observation underlines once again the necessity of extensive preparations.

The fourth observation concerns the difference between “research” interviews and “archival” interviews. Life stories-interviews seem to be of more value compared with interviews focused on certain aspects in the professional life of one individual.¹⁰⁹ This has of course to do with the aim of the project, which is to create a source material that is broad and open and for many potential uses. When dealing with a specific research project, it may be justified to limit the interview to details of interest for a particular research question, but not when creating source material for the posterity. The life story-interview, furthermore, starting with the childhood “opens up” the interview situation. The informant usually does not expect, or is not used to, these kinds of questions. It helps the interviewee to come behind the official “mask” of the informant.¹¹⁰ And often can early experiences in life explain decisions later on. It may be possible to understand why a person acts as he or she did.

¹⁰⁸ If they should be aware of ... the informant (and colleague) may not be keen to explain the evident ...

¹⁰⁹ Compare and contrast with de Chadarevian.

¹¹⁰ Hoddeson.

The fifth observation is on the interview setting. The research secretaries and the practitioners experimented rather freely with the setting of the interview situation. Sometimes two interviewers (usually a research secretary and a senior practitioner) were involved, sometimes two interviewees, and in rare cases a mix of these settings. A conclusion is that one interviewer is to prefer. It makes it easier keep the authority and to construct a story. The other way round seems not to be that critical. Two persons can be interviewed at the same time given that they share experiences of course.

The most crucial methodological observations on a macro-level are first the mutual interdependence of methods, organization and theoretical approach as I touched upon in the previous section, and second the importance of collaboration between historians and practitioners. I will analyze the second in what follows.

A key to its success has been the active *interest* from the communities of computer users. In order to arouse their interest two things has been considered crucial. Firstly, the importance of a continuous *collaboration* between historians and practitioners. The focus groups have in this respect been tremendously useful for the historians in their efforts to identify important events and processes as well as actors. Secondly, the importance of creating *events* where practitioners are given the chance to gather for discussing and remembering their historical past and at the same time socialize. While witness seminars and the specially designed Writers' Web were seen as pure intellectual ventures by historians, they were actually received as social events by practitioners.

The different methods gave rise to mutually reinforcing events. Interviews led to witness seminars which led to interviews which eventually led to the donation of archive material, artifacts, pictures, or the writing of autobiographies. Furthermore, a large part of the witness seminars had an audience of a majority of practitioners, colleagues to the witnesses, from the community. Together with our continuous dissemination of the edited and published transcripts it clearly raised the interest for the project.

The sheer intensity in the activities, the large number of events during a limited time period, created a social fabric. The word was spread, which made it much easier, and gave legitimate reasons, for the research secretaries to approach people otherwise inaccessible. This facilitated very much our work.¹¹¹

The work carried out in the project "From Computing Machines to IT" has led me to the conclusion that the interaction between the practitioners and the research secretaries in the focus groups was decisive for shaping the outcome of the documentation efforts. The practitioners taking part in the focus groups had, on the one hand, a comprehensive and profound *understanding* of the historical events because they had been *close* to them, while they, at the same time, had difficulty contextualizing and valuing the events precisely because of their involvement in them. The research secretaries, on the other hand, had as trained historians an ability to see the events as a part of *a greater whole*, precisely because of their *distance* to the past events. This interaction was also important in order to avoid so-called Whig history, that is, a history of the winners, since the networks that the focus groups emanated from in many cases represented the established actors.

¹¹¹ This reciprocity in the relationship between informants and researchers, I believe, also helps to single out successful from unsuccessful projects.

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Appendix I: List of Source Material

This appendix lists the source material (autobiographies, oral history interviews, witness seminars, Writers' Web entries, and archives, artifacts, pictures et cetera) created and collected in the project.

Autobiographies (General Call)

As mentioned in the second part of this final report two types of calls for autobiographies were made (a general call and a number of focused calls). The general call for autobiographies, which was carried out by the Research Group in collaboration with the National Museum of Science and Technology and Nordiska museet, resulted in 249 answers consisting of 1,461 pages of text in total. Of the answers 190 were considered as autobiographies. The remaining answers consisted of material lacking autobiographical qualities (queries et cetera). The 190 autobiographical entries are listed below according to the following format: [entry number], [name of autobiographer], [possible title], [number of pages]. 129 of the autobiographies are available electronically at the National Museum of Science and Technology's web page www.tekniskamuseet.se/it-minnen and they are marked with italics in the list below. The remaining autobiographies are deposited in the museum's archival collections.

- No. 1, Ragnar Svensson, "Mitt livs historia fram till juli 2007," 3 pp.*
No. 2, Bo Nyqvist, "Ett yrkesliv från 1952 till 2004 med och utan IT," 3 pp.
No. 4, Roy Johansson, "IT-vittnen," 3 pp.
No. 7, Bertil Ahlberg, 2 pp.
No. 8, Göran Dahlström, 9 pp.
No. 9, Inga-Britt Svärd, "Teknikens barfotabarn: Min livshistoria utan och med datorer," 27 pp.
No. 11, Lennart Lövegård, "Bidrag till Databeskrivning," 2 pp.
No. 12, Thomas Ljungdell, 2 pp.
No. 13, Yngve Larsson, "Den första användningen av datorer inom Sydkraft (EON Sverige)," 3 pp.
No. 14, Yngve Lossing, 5 pp.
No. 15, Gunnel Berglund, "Från matematikmaskin till IT," 2 pp.
No. 16, Jan Dahlberg, "Produktionsplanering av Spraytorn – mitt bästa totalmisslyckande," 2 pp.
No. 18, Ulla Lord, 1 pp.
No. 19, Åke Gustavson, "IT-minnen," 2 pp.
No. 20, Bengt Kynning, "Upprop om IT-historia," 4 pp.
No. 21, Pia Gawell, 1 pp.
No. 24, Erik Elvers, 1 pp.
No. 25, Ib Lenneke, 1 pp.
No. 27, Ann Christine Lundh, 1 pp.
No. 30, Åke Rehnberg, 3 pp.
No. 34, Anders Lindgren, 1 pp.
No. 36, Lars B Hedberg, "Självbiografiskt upprop om IT-historia 1958–2007," 34 pp.
No. 38, Gillis Een, 13 pp.
No. 40, Per Mikael Sternberg, 1 pp.
No. 41, Arne Franklin, 1 pp.
No. 49, Alexander Roussos, "Mitt liv som IT-gubbe," 6 pp.
No. 51, Torbjörn Alm, "Vad jag upplevt under mer än 50 år av datautveckling," 6 pp.
No. 53, Torgny Sundin, 1 pp.
No. 54, Erik Sandström, "En resa i TIDAs," 6 pp.
No. 57, Ingvar Holmberg, 6 pp.

- No. 58, Björn Elmblad, 1 pp.
 No. 59, Maria Kallin, 1 pp.
 No. 64, Conny Norman, 1 pp.
 No. 65, Sten Zeilon, 1 pp.
 No. 66, *Kaj Vareman*, 3 pp.
 No. 67, *Kurt Malm*, "Minnen från en svunnen tid – ett inlägg i den svenska IT-historien," 2 pp.
 No. 68, Janis Platbardis, 1 pp.
 No. 70, Bengt-Olov Ljung, 2 pp.
 No. 71, Uno Ahlström, 5 pp.
 No. 72, *Magnus Mogensen*, "Några anspråkslösa rader om mina datorminnen," 2 pp.
 No. 74, *Per-Åke Jansson*, "Mina IT-erfarenheter," 3 pp.
 No. 75, *Bo Andersson*, 5 pp.
 No. 76, Anita Nordstedt-Sparrvik, 1 pp.
 No. 77, *Jacob Palme*, "Datorer på 60-talet och 70-talet. Några svenska datorminnen," 9 pp.
 No. 79, *Mats-Åke Hugoson*, "Svenska IT-historien," 1 pp.
 No. 80, *Bertil Lindberg*, "Mitt liv med informationstekniken," 2 pp.
 No. 81, *Nils Erik Thorell*, "Mina tidiga erfarenheter av datorer," 2 pp.
 No. 82, *Evald Holmén*, "Erfarenheter av matematikmaskiner och datorer," 6 pp.
 No. 83, *Stig L Olsson*, "Min självbiografiska historia," 11 pp.
 No. 85, *Ulf Jansson*, 3 pp.
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- No. 249, Arne Larsson, "MIN IT-historia," 3 pp.

Autobiographies (Focused Calls)

In addition to the project's general call for autobiographies there were a number of calls carried out by the focus groups. These were directed towards the senior practitioners in each focus group and people in their networks. The resulting 24 autobiographies consist of 534 pages of text in total, and they are listed below. 6 of the autobiographies are available electronically at the National Museum of Science and Technology's web page, www.tekniskamuseet.se, and they are marked with italics in the list below. The remaining autobiographies are deposited in the museum's archival collections.

Early Computers

- Lars Arosenius, "Människor i datavärlden – några personliga minnen," 6 pp.*
- Elsa-Karin Boestad-Nilsson, "Besk från FOAs horisont," 3 pp.
- Ingemar Dahlstrand, "To Sort Things Out," 195 pp.*
- Gert Persson, "Computers and Computing' i Skandinavien: Tillbakablick över de första 15 åren i ett svenskt perspektiv," 10 pp.*
- Gunnar Stenudd, "BESK – bygge, byggare och användare," 4 pp.
- Gunnar Stenudd, "Forskning och utveckling efter BESK-tiden," 14 pp.*
- Gunnar Wedell, "Dataminnen," 5 pp.*

Healthcare

- Bengt Dahlin, "Historien om en datorjournal," 21 pp.
- Ingemar Jungner, "Berättelsen om AutoChemist," 77 pp.*
- Åke Holmgård, "Hudiksvall," 4 pp.
- Leif Ohlsén, "Datasytem AutoChemist (ACH) och ACH-Prisma 1964–86: En historisk tillbakablick," 18 pp.
- Leif Ohlsén, "Datasytem Autochemist (ACH)," stencil, 20 pp.
- Torsten Seeman, "Datautvecklingen inom Göteborgs sjukvård 1972–1997," 14 pp.

Higher Education

- Bengt Olsen, "Svensk superdatorhistoria – några minnesbilder," 6 pp.

Information Technology Industries

- Kurt Fredriksson, "Kurt Fredrikssons tillbakablick," 14 pp.

Schools

- K-G Ahlström, 1 pp.
Göran Axelsson, 1 pp.
Robert Ekinge, 3 pp.
Bengt Bruno Lönnqvist, 5 pp.
Gunnar Markesjö, 2 pp.
Bertil Petersson, 5 pp.

Transports

- Kjell Byström, "I huvet på en gammal IT-gubbe," 5 pp.
Jan U Storm, "Hej Bröder i Vägsektorns historia," 2 pp.

User Organizations and User Participation

- Lennart Lennerlöf, "Mitt Arbetliv: En rekonstruerad forskningshistoria," 99 pp.

Oral History Interviews (Recorded, Edited)

166 interviews were created and collected in the project (collected since 11 of the interviews were originally conducted in the 1990s and later donated to the project). The resulting recordings and transcripts are all deposited in the National Museum of Science and Technology's archival collections. 153 of the interviews were recorded, transcribed and edited. The edited transcripts consist of 3,905 pages of text in total. They are listed below. **127** of the edited transcripts are available at the museum's web page: www.tekniskamuseet.se/it-intervjuer. **They are marked in italics below.** The remaining edited transcripts are deposited in the museum's archival collections.

- No. 1: Ingemar Ringström, interview from 2007 by Per Lundin, Div. of History of Science and Technology, KTH, Stockholm, 22 pp.
- No. 2: Gunnar Wedell, interview from 2007 by Per Lundin, Div. of History of Science and Technology, KTH, Stockholm, 19 pp.
- No. 3: Karl Johan Åström, interview from 2007 by Per Lundin, Div. of History of Science and Technology, KTH, Stockholm, 33 pp.
- No. 4: Sture Johannesson and Ann-Charlotte Johannesson, interview from 2007 by Anna Orrghen, School of Culture and Communication, Södertörn University, Stockholm, 30 pp.
- No. 5: Göran Sundqvist, interview from 2007 by Anna Orrghen, School of Culture and Communication, Södertörn University, Stockholm, 28 pp.
- No. 6: Jan W Morthenson, interview from 2007 by Anna Orrghen, School of Culture and Communication, Södertörn University, Stockholm, 30 pp.
- No. 7: Sten Kallin, interview from 2007 by Anna Orrghen, School of Culture and Communication, Södertörn University, Stockholm, 48 pp.
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- No. 98: Kjell Hellberg, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 48 pp.
- No. 99: Birger Kvaavik, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 32 pp.
- No. 100: Gunnar Stenudd, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 37 pp.
- No. 101: SM Eriksson, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 34 pp.
- No. 102: Curt G Olsson, interview from 2008 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, and Anders Rönn, 26 pp.
- No. 103: Jan Wallander, interview from 2008 by Rune Brandinger and Björn Thodenius, Center for Information Management, Stockholm School of Economics, 20 pp.
- No. 104: Rolf Nilsson and Bo Loftrup, interview from 2008 by Martin Emanuel, Div. of History of Science and Technology, KTH, Stockholm, 30 pp.
- No. 105: Kerstin Gunnarsson, interview from 2008 by Sofia Lindgren, Stockholm, 18 pp.
- No. 106: Ingvar Sundgren, interview from 2008 by Sofia Lindgren, Stockholm, 18 pp.
- No. 107: Gunnel Atterfelt, interview from 2008 by Sofia Lindgren, Stockholm, 27 pp.
- No. 108: Bengt Axelsson, interview from 2008 by Sofia Lindgren, Stockholm, 17 pp.
- No. 109: Tom Engström, interview from 2008 by Sofia Lindgren, Stockholm, 26 pp.
- No. 110: Jan Aschan, interview from 2008 by Sofia Lindgren, Stockholm, 15 pp.
- No. 111: Göran Rosman, interview from 2008 by Sofia Lindgren, Stockholm, 19 pp.
- No. 112: Gunilla Carlén, interview from 2008 by Sofia Lindgren, Stockholm, 22 pp.
- No. 113: Stig Medin, interview from 2007 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, and Bengt-Åke Eriksson, 36 pp.
- No. 114: Per Lindberg, interview from 2008 by Sofia Lindgren, Stockholm, 20 pp.

- No. 115: Thord Nilsson, interview from 2008 by Sofia Lindgren, Stockholm, 19 pp.
- No. 116: Bengt Marnfeldt, interview from 2008 by Sofia Lindgren, Stockholm, 21 pp.
- No. 117: Per Olofsson, interview from 2007 by Sture Hallström and Björn Thodenius, Center for Information Management, Stockholm School of Economics, 36 pp.
- No. 118: Rolf Holmberg, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 43 pp.
- No. 119: Sören Arlbring, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 31 pp.
- No. 120: Rune Brandinger, interview from 2008 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, 19 pp.
- No. 121: SPP/AMF, group interview with Perolof Axelson, Jan-Erik Erenius, Birger Fernström and Göran Krantz from 2008 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, 38 pp.
- No. 122: Trygg Hansa, group interview with Olli Aronsson, Kjell Gunnarson and Lars Ågren from 2008 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, 37 pp.
- No. 123: Länsförsäkringar, group interview with Per Lind, Jan-Gunnar Persson, Göran Öfverström and Johnny Östberg from 2008 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, 52 pp.
- No. 124: Lennart Bernhed, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 45 pp.
- No. 125: Christer Jacobsson, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 32 pp.
- No. 126: Per-Olov Lindblom & Stefan Melander, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 38 pp.
- No. 127: Ingvar Anderberg, interview from 2007 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, and Anders Rönn, 24 pp.
- No. 128: Sune Vallgren, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 30 pp.
- No. 129: Göran Nydahl, interview from 2008 by Martin Emanuel, Div. of History of Science and Technology, KTH, Stockholm, 27 pp.
- No. 130: Örjan Broman and Mats Bäck, interview from 2008 by Martin Emanuel, Div. of History of Science and Technology, KTH, Stockholm, 29 pp.
- No. 131: K-G Ahlström, interview from 2008 by Martin Emanuel, Div. of History of Science and Technology, KTH, Stockholm, 25 pp.
- No. 132: Göran Kjellberg, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 27 pp.
- No. 133: Anita Kollerbauer, interview from 2008 by Martin Emanuel, Div. of History of Science and Technology, KTH, Stockholm, 34 pp.
- No. 134: Jan Boström, interview from 2008 by Martin Emanuel, Div. of History of Science and Technology, KTH, Stockholm, 30 pp.
- No. 135: Bengt Nilsson, interview from 2008 by Martin Emanuel, Div. of History of Science and Technology, KTH, Stockholm, 33 pp.
- No. 136: Ulla Riis, interview from 2008 by Martin Emanuel, Div. of History of Science and Technology, KTH, Stockholm, 38 pp.
- No. 137: Bo Holmqvist & Fred Norling, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 43 pp.
- No. 138: Bernhard Gustafsson, interview from 2008 by Gustav Sjöblom, Technology and Society, Chalmers University, 29 pp.

- No. 139: Sture Hallström, interview from 2008 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, 29 pp.
- No. 140: Bengt-Åke Eriksson, interview from 2008 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, 15 pp.
- No. 141: Erik Altenstedt, interview from 1998 by Kurt Fredriksson, 9 pp.
- No. 142: Jonny Andersson, interview from 1998 by Kurt Fredriksson, 4 pp.
- No. 143: Sven Brunnander, interview from 1998 by Kurt Fredriksson, 10 pp.
- No. 144: Bengt Ek, interview from 1999 by Kurt Fredriksson 5 pp.
- No. 145: Sven Eklöf, interview from 1998 by Kurt Fredriksson 4 pp.
- No. 146: Lars-Olof Granat (formerly Karlsson), interview from 1998 by Kurt Fredriksson, 14 pp.
- No. 147: Stig Karlsson, interview from 1998 by Kurt Fredriksson, 18 pp.
- No. 148: Stig Larsson, interview from 1996 by Kurt Fredriksson, 6 pp.
- No. 149: Jörgen Nilsson, interview from 1999 by Kurt Fredriksson, 3 pp.
- No. 150: Lennart Palm, interview from 1998 by Kurt Fredriksson, 11 pp.
- No. 151: Nils Råberg, interview from 1998 by Kurt Fredriksson, 9 pp.
- No. 152: Birger Skog, interview from 2007 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, and Sture Hallström, 32 pp.
- No. 153: Thomas Glück, interview from 2007 by Björn Thodenius, Center for Information Management, Stockholm School of Economics, and Per Olof Persson, 19 pp.

Oral History Interviews (Recorded, Not Edited)

7 of the 166 interviews conducted in the project were not edited. This was due to one or more of the following three reasons: content of the interview not considered valuable; poor quality of audio files; interviewee did explicitly not permit the material to be edited or used. The recordings and transcripts of the interviews, which are listed below, are, however, deposited in the National Museum of Science and Technology's archival collections.

- Dines Bjørner, interview from 2007 by Per Lundin, Div. of History of Science and Technology, KTH, Stockholm.
- Inger Marklund, interview from 2008 by Martin Emanuel, Div. of History of Science and Technology, KTH, Stockholm.
- Åke Sandberg, part I, interview from 2008 by Per Lundin, Div. of History of Science and Technology, KTH, Stockholm.
- Åke Sandberg, part II, interview from 2008 by Per Lundin, Div. of History of Science and Technology, KTH, Stockholm.
- Werner Schneider, interview from 2005 by Hans Peterson and Urban Rosenqvist.
- Sven Stegfors, interview from 2008 by Sofia Lindgren, Stockholm.
- Albert Öjemark, interview from 2007 by Rune Brandinger and Björn Thodenius, Center for Information Management, Stockholm School of Economics.

Oral History Interviews (Not Recorded, Edited)

6 of the 166 interviews conducted in the project were not recorded, but edited based on notes made by the interviewer during the interview session. These 6 interviews, which not should be seen as edited transcripts, were used as sources for the chapter "Användarna kommer till tals" by Mats Utbult in the published report *Användarna och datorerna: En historik 1960–1985*, Vinnova Rapport VR 2009:2 (Stockholm, 2009). They interviews

are listed below, but it should be noted that they are *not* deposited in the National Museum of Science and Technology's archival collections.

Martti Hakkala, interview from 2008 by Mats Utbult, Stockholm.
Christian Hörup, interview from 2008 by Mats Utbult, Stockholm.
Peter Kjellqvist, interview from 2008 by Mats Utbult, Stockholm.
Claes Leo Lindwall, interview from 2008 by Mats Utbult, Stockholm.
Sture Ring, interview from 2008 by Mats Utbult, Stockholm.
Mats Schultze, interview from 2008 by Mats Utbult, Stockholm.

Witness Seminars (Edited, Published)

47 witness seminars were held within the project. The resulting recordings and transcripts are all deposited in the National Museum of Science and Technology's archival collections. The 47 edited transcripts consist of 2,417 pages of text in total. All transcripts were edited and 44 of them published both in print and electronic versions (2,271 pages of text). These are listed below. The electronic versions are available in KTH's working paper series TRITA-HST at the Academic Archive On-line (DiVA): www.diva-portal.org.

- Dávila, Milena, ed., *Datorisering av medicinska laboratorieverksamhet 1: En översikt: Transkript av ett vittnesseminarium vid Svenska Läkaresällskapet i Stockholm den 17 februari 2006*, TRITA-HST 2008/5 (Stockholm, 2008), 41 pp.
- Dávila, Milena, ed., *Datorisering av medicinska laboratorieverksamhet 2: Massanalyser och hälsokontroller: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 20 september*, TRITA-HST 2008/6 (Stockholm, 2008), 40 pp.
- Emanuel, Martin, ed., *ABC 80 i pedagogikens tjänst: Exempel på tidig användning av mikrodata i den svenska skolan: Transkript av ett vittnesseminarium vid Cloetta Center i Linköping den 23 september 2008*, TRITA-HST 2008/32 (Stockholm, 2009), 56 pp.
- Emanuel, Martin, ed., *Folkbildning kring datorn 1978–85: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 9 oktober 2008*, TRITA-HST 2008/36 (Stockholm, 2009), 52 pp.
- Emanuel, Martin, ed., *Datorn i skolan: Skolöverstyrelsens och andra aktörers insatser, 1970- och 80-tal: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 30 oktober 2008*, TRITA-HST 2008/40 (Stockholm, 2009), 62 pp.
- Ernkvist, Mirko, ed., *Svensk dataspelsutveckling, 1960–1995: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 12 december 2007*, TRITA-HST 2008/28 (Stockholm, 2008), 54 pp.
- Gribbe, Johan, ed., *Att modellera slagfältet: Tidig databehandling vid FOA, 1954–66: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 15 oktober 2007*, TRITA-HST 2007/7 (Stockholm, 2007), 39 pp.
- Gribbe, Johan, ed., *JA 37: Pilot system: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 11 december 2007*, TRITA-HST 2008/1 (Stockholm, 2008), 51 pp.
- Gribbe, Johan, ed., *NIBS: Utvecklingen av Näckens informationsbehandlingssystem, 1966–82: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 14 januari 2008*, TRITA-HST 2008/3 (Stockholm, 2008), 46 pp.
- Gribbe, Johan, ed., *LEO: Databehandling och operativ ledning inom försvaret: Transkript av ett vittnesseminarium vid Högkvarteret i Stockholm den 15 januari 2008*, TRITA-HST 2008/4 (Stockholm, 2008), 59 pp.
- Gribbe, Johan, ed., *Tidig flygradar: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 15 april 2008*, TRITA-HST 2008/13 (Stockholm, 2008), 55 pp.

- Klein, Kajsa, ed., *Integritetsdebatten åren kring 1984: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 30 november 2007*, TRITA-HST 2008/9 (Stockholm, 2007), 46 pp.
- Larsson, Ebba, ed., *Fastighetsdatasystemet: Transkript av ett vittnesseminarium vid Linköpings universitet den 30 september 2008*, TRITA-HST 2008/35 (Stockholm, 2008), 59 pp.
- Lindgren, Sofia & Julia Peralta, eds., *Lysator: Transkript av ett vittnesseminarium vid Linköpings universitet den 21 februari 2008*, TRITA-HST 2008/8 (Stockholm, 2008), 69 pp.
- Lindgren, Sofia & Julia Peralta, eds., *Datacentralerna för högre utbildning och forskning: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 27 mars 2008*, TRITA-HST 2008/17 (Stockholm, 2008), 55 pp.
- Lindgren, Sofia & Julia Peralta, eds., *Högre datautbildningar i Sverige i ett historiskt perspektiv: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 24 januari 2008*, TRITA-HST 2008/18 (Stockholm, 2008), 53 pp.
- Lindgren, Sofia, ed., *Dataföreningar i Sverige: 1949–1990: Framväxt och förändringsmönster: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 26 september 2008*, TRITA-HST 2008/33 (Stockholm, 2008), 53 pp.
- Lindgren, Sofia, ed., *Fackpress på dataområdet: Exempel från 1960- och 1970-talet: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 14 oktober 2008*, TRITA-HST 2008/37 (Stockholm, 2008), 48 pp.
- Lundin, Per, ed., *Att arbeta med 1950-talets matematikmaskiner: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 12 september 2005*, TRITA-HST 2006/1 (Stockholm, 2006), 43 pp.
- Lundin, Per, ed., *Tidig programmering: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 16 mars 2006*, TRITA-HST 2007/1 (Stockholm, 2007), 43 pp.
- Lundin, Per, ed., *Databehandling vid Väg- och vattenbyggnadsstyrelsen/Vägverket 1957–1980: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 22 maj 2006*, TRITA-HST 2007/2 (Stockholm, 2007), 42 pp.
- Lundin, Per, ed., *Administrativ systemutveckling i teori och praktik: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 26 november 2007*, TRITA-HST 2008/19 (Stockholm, 2008), 52 pp.
- Lundin, Per, ed., *Tidiga e-postsystem: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 14 februari 2008*, TRITA-HST 2008/20 (Stockholm, 2008), 54 pp.
- Lundin, Per, ed., *Den skandinaviska skolan i systemutveckling under 1970- och 1980-talen: Exemplet DEMOS och UTOPLA: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 31 mars*, TRITA-HST 2008/21 (Stockholm, 2008), 54 pp.
- Lundin, Per, ed., *Styrbjörn: Utvecklingen och användningen av ett konstruktions- och produktionsystem för skeppsbyggnad vid Kockums under 1960- och 1970-talen: Transkript av ett vittnesseminarium vid Tekniska museet i Malmö den 2 oktober 2008*, TRITA-HST 2008/30 (Stockholm, 2008), 53 pp.
- Nilsson, Mikael, ed., *Staten och kapitalet: Betydelsen av det dynamiska samspelet mellan offentligt och privat för det svenska telekomområdet: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 18 mars 2008*, TRITA-HST 2008/10 (Stockholm, 2008), 46 pp.
- Nilsson, Mikael, ed., *Sambandsystem 9000 ur ett användarperspektiv: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 13 mars 2008*, TRITA-HST 2008/11 (Stockholm, 2008), 51 pp.
- Nilsson, Mikael, ed., *Radiokommunikationsutvecklingens betydelse för mobilteleindustrin: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 12 mars 2008*, TRITA-HST 2008/12 (Stockholm, 2008), 36 pp.
- Orrghen, Anna, ed., *Tidiga söksystem: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 21 januari 2007*, TRITA-HST 2007/7 (Stockholm, 2008), 62 pp.

- Peralta, Julia, ed., *ADB i Folkbokföring och beskattning: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 17 januari 2008*, TRITA-HST 2008/14 (Stockholm, 2008), 53 pp.
- Peralta, Julia ed., *Statskontoret: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 5 februari 2008*, TRITA-HST 2008/15 (Stockholm, 2008), 45 pp.
- Peralta, Julia ed., *ADB och den allmänna försäkringen: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 12 februari 2008*, TRITA-HST 2008/16 (Stockholm, 2008), 56 pp.
- Sjöblom, Gustav, ed., *Systemutveckling och långtidsplanering vid SAS Data i Stockholm, 1964–1982: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 5 december 2007*, TRITA-HST 2008/22 (Stockholm, 2008), 49 pp.
- Sjöblom, Gustav, ed., *Standardekonomisystem för stordatorer: EPOK, EPOS & FACTS, 1969–1986: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 29 januari 2008*, TRITA-HST 2008/23 (Stockholm, 2008), 62 pp.
- Sjöblom, Gustav, ed., *Standardisering och integration av datasystem inom godstransportsektorn, 1964–1985: Transkript av ett vittnesseminarium i Göteborg den 11 mars 2008*, TRITA-HST 2008/24 (Stockholm, 2008), 54 pp.
- Sjöblom, Gustav, ed., *IT-konsultbranschens uppkomst och tillväxt, 1964–1985: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 1 april 2008*, TRITA-HST 2008/25 (Stockholm, 2008), 69 pp.
- Sjöblom, Gustav, ed., *Varubushandelns datorisering före 1980: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 29 september 2008*, TRITA-HST 2008/34 (Stockholm, 2009), 51 pp.
- Sjöblom, Gustav, ed., *Dagligvarubandelns datorisering före 1985: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 20 oktober 2008*, TRITA-HST 2008/38 (Stockholm, 2009), 47 pp.
- Sjöblom, Gustav, ed., *Införandet av streckkoder i Sverige: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 22 oktober 2008*, TRITA-HST 2008/39 (Stockholm, 2009), 48 pp.
- Skoglund, Crister, ed., *Föreställningar om informationsambället under 1980-talets första hälft: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 27 maj 2008*, TRITA-HST 2008/41 (Stockholm, 2008), 46 pp.
- Thodenius, Björn, ed., *IT i bank- och finanssektorn 1960–1985: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 13 mars 2006*, TRITA-HST 2008/2 (Stockholm, 2008), 53 pp.
- Thodenius, Björn, ed., *Teknikutveckling i bankerna fram till 1985: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 12 november 2007*, TRITA-HST 2008/26 (Stockholm, 2008), 55 pp.
- Thodenius, Björn, ed., *De viktigaste drivkrafterna för att utnyttja IT inom försäkringsbranschen 1960–1985: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 29 mars 2006*, TRITA-HST 2008/27 (Stockholm, 2008), 56 pp.
- Thodenius, Björn, ed., *Uttagsautomater: Transkript av ett vittnesseminarium vid Tekniska museet i Stockholm den 16 januari 2007*, TRITA-HST 2008/31 (Stockholm, 2008), 53 pp.

Witness Seminars (Edited, Not Published)

3 of the 47 edited transcripts of witness seminars are not published in print or electronically, but are available electronically at the National Museum of Science and Technology's web page: www.tekniskamuseet.se.

Ernkvist, Mirko, ed., "Införandet av EDB som stöd för logistikprocessen inom Volvo 1958–1973, skildrad utifrån användarnas perspektiv: Rapport bearbetad utifrån ett

- vittnesseminarium på Volvo IT den 29 maj 2006” (non-published report, 2007), 49 pp.
- Geijerstam, Jan af, ed., “Sandvikens Jernverks AB och IT: Transkript av ett vittnesseminarium vid Sandvik AB i Sandviken den 30 oktober 2007” (non-published report, 2008), 49 pp.
- Geijerstam, Jan af, ed., “VIS/MIS – visionen om den kompletta informationen: Transkript av ett vittnesseminarium vid Chalmers tekniska högskola i Göteborg den 8 maj 2008” (non-published report, 2008), 48 pp.

Writers' Web Entries

In addition to the call for autobiographies the project developed a virtual platform, Writers' Web, with the URL <http://ithistoria.se/>. 27 autobiographies and 17 comments to these were posted at the Writers' Web site between May 2007 and February 2009. The autobiographies and comments are listed below according to the following format: [name of autobiographer], [title], [day of the week], [date and time] by [user identity]. All entries are available at <http://ithistoria.se/>.

- Paul Hall, “Vi datoriserade patientinformation av Paul Hall,” mån, 2007-05-28 10:06 av Isabelle Dussauge.
 Comment: “Cigarrlådan' Paul nämner,” fre, 2007-10-19 08:04 av todan.
 Comment: “Vi på Spårvägen hade två,” fre, 2007-10-26 20:28 av Lars.
- Lars-Erik Lundberg, “Service av datorer och digital utrustning,” tors, 2007-08-30 09:16, av Labiata.
- Malcolm Thomason, “IT erfarenheter från 70 talet – minnen,” ons, 2007-09-19 09:19, av Malcolm Thomason.
 Comment: “Hej Malcolm! Du skriver,” tors, 2007-09-20 20:06 av Lars.
 Comment: “Hej Lars, Jag har kollat och,” fre, 2007-09-21 06:45 av Malcolm Thomason.
- Henric Nordlander, “Bidrag till IT-historia - Minnen från Kreditbanken,” mån, 2007-10-01 10:57 av henricn.
- “Monte Carlo funkade inte...,” ons, 2007-10-10 19:48 av lmesbob.
- “AKORD, Automatisk KONstruktion och ReläsatsDokumentation,” tis, 2007-10-23 20:28 av Neve.
- Björn Sölving, “År 2000 hade jag jobbat 40 år med datorer,” lör, 2007-10-27 11:19 av BjörnSölving.
- Ingvar Holmberg, “Från OC71 till Internet,” ons, 2007-11-07 19:47 av Ingvar_Holmberg.
- Thom jaxhagen, “Från glödtråd till chips,” tors, 2007-11-08 12:04 av Tjjax.
- B.Svante Eriksson, “Hur Sunet skapades,” sön, 2007-11-18 13:00 av B.Svante.
- Lars Fors, “Min IT-historia,” mån, 2007-11-26 14:31 av LarsF.
- Sam-Olof Sandström, Generationsbyten, ons, 2007-11-28 17:33 av Sam-Olof.
- Christian Ekvall, “Självbiografi av Christian Ekvall,” tors, 2007-11-29 14:54 av Anne Marcusson.
- Kurt Svensson, “Från mekanik till elektronik,” fre, 2007-11-30 10:38 av Kurt.Svensson.
- Teddy L. Rosenthal, “IT-hågkomster med spretiga minnesbilder,” fre, 2007-11-30 13:03 av TeddyLennart.
- Bengt Dahlin, “Historien om en datorjournal,” fre, 2007-11-30 13:17 av bengtdahlin.
- Bertil Palmgren, “Mina 40 års verksamhet i Svensk Dator Tillverkning,” lör, 2007-12-01 19:25 av Z-man.
- Gunvor Svartz-Malmberg, “Att söka vetenskaplig litteratur via dator av Gunvor Svartz-Malmberg,” mån, 2007-12-03 12:13 av Anne Marcusson.

Tom Wallin, "Bibliografisk IT-historia från datoranvändare på KTH-institution Tom Wallin, född 1933," tis, 2007-12-04 12:56 av Anne Marcusson.

Sven Westman, "Mössen invaderar BESK!," tors, 2007-12-06 12:18 av sgiw.

Owe Svensson, "Den första medicintekniska datorn i Lund," tors, 2007-12-13 22:03 av Owe.

Helge Eriksson, "Kommunal entré i datavärlden," fre, 2007-12-28 18:18 av helge.e.
 Comment: "Gunnar Eriksson Roland," fre, 2008-11-21 19:59 av Gunnar.

"När minnesdumpar inte räckte...," ons, 2007-10-10 20:49 av lmesbob.
 Comment: "Säkerhetsnivån vid," lär, 2007-11-03 13:47 av Bernte.
 Comment: "OK, Bernte! Men jag minns," ons, 2007-11-07 14:19 av Lars.
 Comment: "Ett av de smartare sätten," ons, 2008-01-09 15:25 av Bernte.
 Comment: "Ang. Stockholms Spårvägar," tis, 2008-01-01 16:30 av helge.e.
 Comment: "Jo, sådant var vanligt på," ons, 2008-01-16 22:03 av Lars.
 Comment: "Jag tror han var," tors, 2008-01-17 12:31 av Lars.
 Comment: "Underliga äro elektronernas," sön, 2008-01-20 18:46 av ollee.
 Comment: "Jomennisst! Vissa system," tis, 2008-01-22 19:10 av Lars.
 Comment: "Jodå Olle – och du var en," tors, 2009-01-29 20:26 av Bernte.

Lars Asplund, "Som programmerare 1966-1982," mån, 2007-09-03 20:57 av Lars.
 Comment: "Resten av mitt liv med," ons, 2008-01-30 21:09 av Lars.

Carl-Uno Manros, "Min IT-historia 1964 till 2001," tis, 2007-10-23 18:40 av Manros.
 Comment: "Jag tycker att det är en," sön, 2007-11-18 17:44 av Lars.
 Comment: "Kul och intressant historia," tors, 2008-02-07 17:12 av Niklas.

Patrik Strömberg, "Från Abc 80 till Compiz och senare Atari och Mac," mån, 2008-06-16 17:17 av Patrik_Strömberg.

"Hur hamnade jag inom IT?," lär, 2009-02-21 14:53 av Grosen.

Appendix II: List of Additional Material

Final Reports

The 21 final reports on the work carried out by the 16 focus groups are available electronically at the National Museum of Science and Technology's web page: www.tekniskamuseet.se.

- Dussauge, Isabelle, "Slutrapport: IT inom vården" (non-published report, 2008), 10 pp.
- Emanuel, Martin, "Slutrapport: Datorn i grundskolan, gymnasieskolan och i folkbildningen" (non-published report, 2009), 11 pp.
- Ernkvist, Mirko, "Slutrapport: Svensk dataspelsutveckling, 1960–1995" (non-published report, 2008), 6 pp.
- Geijerstam, Jan af, "Slutrapport: Industri" (non-published report, 2008), 13 pp.
- Gribbe, Johan, "Slutrapport: IT i försvaret" (non-published report, 2008), 9 pp.
- Klein, Kajsa, "Slutrapport: Integritetsdebatten" (non-published report, 2008), 9 pp.
- Lindgren, Sofia, "Slutrapport: ABM" (non-published report, 2009), 8 pp.
- Lindgren, Sofia, "Slutrapport: Media" (non-published report, 2009), 8 pp.
- Lindgren, Sofia & Julia Peralta, "Slutrapport: IT i universitet och högskolor" (non-published report, 2008), 11 pp.
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- Orrghen, Anna, "Slutrapport: ABM (arkiv, bibliotek, museer)" (non-published report, 2008), 16 pp.
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- Sjöblom, Gustav, "Slutrapport: IT-industrin" (non-published report, 2008), 8 pp.
- Sjöblom, Gustav, "Slutrapport: IT i transportbranschen" (non-published report, 2008), 8 pp.
- Sjöblom, Gustav, "Slutrapport: Handel" (non-published report, 2009), 6 pp.
- Thodenius, Björn, "Slutrapport: Finans/Bank" (non-published report, 2008), 19 pp.
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- Utbutt, Mats, "Slutrapport: Användarreaktioner på en metallindustri, ett kommunalt energiverk, ett tidningsföretag och ett pappersmassabruk, speglade genom arbetslivsintervjuer; användarreaktioner inom kontorsarbete i statens tjänst, speglad genom en studie av fackförbundspress" (non-published report, 2008), 6 pp.

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- Dussauge, Isabelle, "Datorer och hälsokontroller (1960- och 1970-tal)" (non-published document, 2008), 19 pp.
- Dussauge, Isabelle, "Kunskapsöversikt: IT och patientjournal" (non-published document, 2008), 25 pp.

- Emanuel, Martin, “Kunskapsöversikt: Datorn i skolan” (non-published document, 2009), 22 pp.
- Geijerstam, Jan af & Anne Marcusson, “Notiser ur datoriseringens historia vid Sandvikens Jernverks AB/Sandvik AB” (non-published document, 2007), 19 pp.
- Klein, Kajsa, “Kunskapsöversikt: Integritetsdebatten 1966–1986” (non-published document, 2007), 55 pp.
- Lindgren, Sofia & Julia Peralta, “Introduktion till kunskapsöversikt gällande fokusområdet universitet och högskola” (non-published document, 2008), 31 pp.
- Lundin, Per, “Kunskapsöversikt: IBM Nordiska Laboratorier” (non-published document, 2007), 17 pp.
- Nilsson, Mikael, “Forskningsöversikt, området mobil telekom” (non-published document, 2008), 8 pp.
- Orrghen, Anna, “Kunskapsöversikt: ABM: Datoranvändning för litteraturhantering” (non-published document, 2008), 13 pp.
- Orrghen, Anna, “Kunskapsöversikt: Datorer och konst” (non-published document, 2008), 26 pp.
- Peralta, Julia, “Offentlig förvaltning, rationaliseringsarbete och den nya ADB-tekniken” (non-published document, 2008), 51 pp.
- Schedin, Mats, “IT-historia (Industrigruppen): Affärer och IT samverkade” (non-published document, 2008), 7 pp.
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- Du Rietz, Peter, *Samdoks höstmöte*, Stockholm, Sweden, November 21, 2008.
- Lundin, Per, *Comparative Perspectives on the History of Nordic Information Technology: Planning Symposium at the Seili Island*, August, 24–26 2005, Seili, Finland.
- Lundin, Per, *IFIP WG9.7 Second Working Conference on the History of Nordic Computing*, August 21–23, 2007, Turku, Finland.
- Lundin, Per & Isabelle Dussauge, *Society for the History of Technology's Annual Meeting*, October 12–14, 2008, Lisbon, Portugal.
- Sjöblom, Gustav, *Teknik- och vetenskapshistoriska dagarna*, Stockholm, Sweden, April 9, 2008.
- Sjöblom, Gustav, *European Business History Association Conference*, Bergen, Norway, August 23, 2008.

Other Presentations on the Project

- Du Rietz, Peter, Pelles Lusthus, Nyköping, Sweden, March 6, 2008.
- Du Rietz, Peter, Senioruniversitetet, Stockholm, Sweden, September 24, 2008.

- Lundin, Per, KTH Seminar, Div. of History of Science and Technology, KTH, Stockholm, November 5, 2007.
- Lundin, Per & Gustav Sjöblom, IT-CEUM, Linköping, October 30, 2007.
- Sjöblom, Gustav, The Swedish Research School of Management and Information Technology, Gothenburg, Sweden, February 6, 2008.
- Sjöblom, Gustav, lunch seminar, School of Technology, Management and Economics, Chalmers University of Technology, Gothenburg, Sweden, April 17, 2008.
- Sjöblom, Gustav, workshop, Dept. of Economic History, University of Gothenburg, Sweden, April 22, 2009.
- Sjöblom, Gustav, EHFF, Stockholm School of Economics, Sweden, May 5, 2009.

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- Lundin, Per, "From Computing Machines to IT: Collecting, Documenting, and Preserving Source Material on Swedish IT-History," in *IFIP WG9.7 Second Working Conference on the History of Nordic Computing* (forthcoming 2009 on Springer Science).
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- Utbult, Mats, "Användarna kommer till tals," in *Användarna och datorerna: En historik 1960–1985*, Vinnova Rapport VR 2009:2, ed. Birgitta Frejhagen (Stockholm, 2009), 112–138.

Appendix III: Formal Description of Organization and Work Process

Organization and Responsibilities

The project is led by *the project leader* Rolf Berndtson, chairman in the Swedish Computer Society. The project leader delegates the responsibility for identifying, collecting and creating of source material as well as producing edited material to *the Research Group*, which is located to the Division of History of Science and Technology at KTH and is led by *the research project leader* Per Lundin. Furthermore, the project leader delegates the responsibility for administration, preservation and dissemination of source material to *the Group for Administration of Material*, which is located to the National Museum of Science and Technology and is led by the *administration project leader* Peter Du Rietz.

A *Steering Group* advises the project leader in his work. A *project coach* assists and advises the project leader, the Research Group and the Group for Administration of Material in their work. Per Olof Persson, Athena Konsult AB, is project coach.

A *Managerial Group* consisting of the project leader, the research project leader, the administration project leader and the project coach has the operative responsibility.

The Research Group has two tasks. Firstly, to co-ordinate, develop and evaluate the methods used, to keep the project updated on the state of the art in computing history and oral history, to establish and maintain contacts with national and international research environments. The Research Group participates in ongoing discussions on methods for contemporary history and presents the project's results at national and international conferences. Secondly, to identify, collect and create source material as well as produce edited source material. The research project leader is responsible for delegating the second task to *the research secretaries*.

The research secretaries belong under the Research Group. Each of the research secretaries is in turn responsible for a *Focus Group*. The Focus Group is related to a *focus area*. The project has identified sixteen focus areas. These are early computers, healthcare, financial industries, manufacturing industries, information technology industries, systems development, user organizations and user participation, transports, defense, public administration, telecommunications, higher education, archives, libraries and museums, media, schools, and retail industries. The Focus Group consists of a *research secretary* and a number of practitioners with experience from the area in question. The practitioners should be representative for the focus area. The role of the practitioners is to assist and advice the research secretary in his or her work. Together they identify important historical events and processes as well as relevant and representative witnesses of these. Furthermore, they arrange witness seminars, conduct interviews and invites people to write autobiographies. It is the responsibility of the research secretary to work out knowledge outlines, to decide – in consultation with the practitioners – which topics that should be covered, which type of collection that should be carried out and to which extent. The research secretary is also responsible for the process of collecting, creating and editing source material as well as publish it when appropriate. He or she is furthermore responsible for presenting a final report on the work completed by the Focus Group.

A *Scientific Council* advice the Research Group in its methodological work. The Scientific Council is led by Arne Kaijser.

The research project leader and the research secretaries are assisted by a *project secretary*, which belongs under the Research Group. The project secretary functions foremost as the link between the research secretaries and the Group for Administration of Material and is responsible for delivering the collected and created source material to the Group for Administration of Material. The project secretary also assists the Managerial Group.

The Group for Administration of Material is responsible for registering and preserving the source material, which the Focus Groups have collected and created, in the National Museum of Science and Technology. It also has the responsibility to oversee that documentation efforts are performed along the lines a long-term preservation practice requires. An archivist, a curator, a librarian, a photographer belongs under the Group for Administration of Material.

An *Administrative Council* advice the Group for Administration of Material in its work. It is led by Anne Louise Kemdal (later replaced by Ann Follin).

The participants in the organizational bodies described above are listed in Appendix IV: Participants in the Project.

Picture 6. An overview of the project organization.

Deliverables and Debriefing

As mentioned each research secretary is responsible for realizing the documentation in each focus area. For *each focus area* the project has, towards the financiers, agreed to deliver:

- 1 knowledge outline
- 3 witness seminars
- 10 interviews
- 1 final report

It should be emphasized that this composition of deliverables may vary from focus area to focus area. In some cases it may be more relevant with more interviews and less witness seminars. In other cases the reverse may hold true. The composition of deliverables for each focus area is specified by the research secretary and the Focus Group.

Each research secretary has 25 paid weeks to his or her disposal. These are suggested to be distributed approximately as follows:

- 1 knowledge outline, 3 weeks
- 3 witness seminars, 13 weeks (5+4+4)
- 10 interviews, 6 weeks (3 days for each interview)
- 1 final report, 1 week
- Research Group-/Focus Group-activities, 2 weeks

The project has, over and above these deliverables, agreed to deliver about 200 autobiographies. The collection of these is carried out by the Research Group with the help of questionnaires according to the methodology developed by Nordiska museet as well as with the help of a specially designed Writers' Web.

Debriefing

Research secretaries and the project secretary debriefs to the research project leader in form of a monthly status report, while the research project leader, the administration project leader and the project coach in turn debriefs to the project leader in form of a monthly status report.

Work Process for a Focus Area

The work within a focus area is divided into three phases: *initiation*, *realization* and *finalization*. The phase of initiation is estimated to three months, the phase of realization to twelve and the phase of finalization to two months.

Initiation

The work within a focus area begins with the production of a *project plan*. The project plan includes a preliminary study of the focus area in question. It contains furthermore a budget, deliverables and a time schedule. The project plan is prepared by the Managerial Group. The plan is approved by the project leader.

A research secretary is engaged after the project plan has been prepared and approved. The Managerial group handles this task. The project leader makes the decision to employ. A Focus Group is assembled after the project plan has been prepared and approved and a research secretary has been employed. The research secretary and the project coach carries together out this task.

The phase of initiation is completed when a project plan has been approved, a research secretary employed and a Focus Group assembled.

Realization

The Focus Group elaborate a detailed *plan of action* for the realization of the work according to the overarching guidelines that have been given in the project plan. The plan of action specifies the number of deliverables. The research secretary is responsible for the preparation of the plan of action, which in turn is approved by the research project leader. The process of creating and collecting source material according to the criteria and methods set up by the project can then start.

The phase of realization is completed when the deliverables (including a final report) have been produced. The research secretary's commitment comes to an end with the completion of the phase of realization.

Finalization

The Focus Group's commitment on non-profit basis may continue for a while after the research secretary's commitment has come to an end. That the group's continuing commitment is limited to only two months of time is due to the National Museum of Science and Technology's limited capacity to receive and administer material over and above the Group of Administration of Material's tasks.

Administration of Created and Collected Sources

The Group for Administration of Material at the National Museum of Science and Technology is responsible for the administration of the created and collected sources. It receives the material from the Focus Groups, and sort out material of low quality and possible duplicates in dialogue with the research secretaries. It make sure that the mate-

rial is consistent with the Personal Data Act (*personuppgiftslagen, PUL*), and in consultation with the donor the administration project leader clarify copyrights for material that may be copyright protected. The Group for Administration of Material also classifies the material, provide it with metadata and store it in digital form.

Material that cannot be incorporated in the National Museum of Science and Technology's collections should either be returned to the donor or be forwarded to another interested party. It is the responsibility of the administration project leader to make these decisions in consultation with the donor.

The Group for Administration of Material register the received the material in the databases for the National Museum of Science and Technology's collections (the database for pictures and artifacts, the database for archives, and the library catalogue).

Information Management

The project uses Projektplatsen at www.projektplatsen.se as a tool for managing internal information. We have designed Projektplatsen so it contains different sections for shared information, for the Research Group and for each and every one of the Focus Groups. The web site also contains an overarching description of the project, its current status and news. The section for shared information contains the Project Manual, protocols from the Steering Group's meetings and information on funding. The section for the Research Group contains information on methodology, reference literature and protocols from the Research Group's meetings. The sections for the different Focus Groups contain information on the activities of each group.

Each research secretary has the responsibility to document the meetings in his or her Focus Group and upload the protocols to Projektplatsen. The project secretary administer the web site.

External information on the project is found at the web portal <http://ithistoria.se>, which links to the web pages of the Swedish Computer Society (www.dfs.se), the Division of History of Science and Technology at KTH (www.kth.se/abe/inst/philhist/tekhist), and the National Museum of Science and Technology (www.tekniskamuseet.se). The project leader is responsible for updating the information at the web portal and the project secretary for administering it.

Appendix IV: Participants in the Project

Steering Group

Rolf Berndtson (chairman)	The Swedish Computer Society
Per Olof Persson (secretary)	Athena Konsult P O Persson AB
Peter Du Rietz	The National Museum of Science and Technology
Anne-Marie Fransson*	IT & Telekomföretagen
Inger Gran	The Swedish Computer Society
Gunnar L. Johansson	formerly CEO Volvo, formerly CEO Industriförbundet
Arne Kaijser	Div. of History of Science and Technology, KTH
Per Lundin	Div. of History of Science and Technology, KTH
Per Olofsson	formerly CEO IBM Sweden
Helene Sjunnesson**	The National Museum of Science and Technology

* Fransson replaced Ylva Hambræus-Björling, IT & Telekomföretagen, in 2007.

** Sjunnesson replaced Anne Louise Kemdal, the National Museum of Science and Technology, in 2008.

Managerial Group

Rolf Berndtson (chairman)	The Swedish Computer Society
Sofia Lindgren* (secretary)	The Swedish Computer Society
Peter Du Rietz	The National Museum of Science and Technology
Per Lundin	Div. of History of Science and Technology, KTH
Per Olof Persson	Athena Konsult P O Persson AB

* Lindgren replaced Cecilia Calmfors in 2007. Calmfors had earlier replaced Åsa Hiort af Ornäs.

Scientific Council

Arne Kaijser (chairman)	Div. of History of Science and Technology, KTH
Per Lundin (secretary)	Div. of History of Science and Technology, KTH
Boel Berner	Dept. of Technology and Social Change, Linköping University
Isabelle Dussauge	Div. of History of Science and Technology, KTH
Jan Garnert	The National Museum of Science and Technology
Lars Ilshammar	Labour Movement Archives and Library
Jenny Sundén	Media Technology and Graphic Arts, KTH

Administrative Council

Anne Louise Kemdal (chairman)	The National Museum of Science and Technology
Peter Du Rietz (secretary)	The National Museum of Science and Technology
Torbjörn Hörnfeldt	The National Archives
Per Olof Persson	Athena Konsult P O Persson AB

Research Group

Per Lundin (chairman)	Div. of History of Science and Technology, KTH
Milena Davila	Div. of History of Science and Technology, KTH
Isabelle Dussauge	Div. of History of Science and Technology, KTH

Martin Emanuel	Div. of History of Science and Technology, KTH
Mirko Ernkvist	Dept. of Economic History, University of Gothenburg
Jan af Geijerstam	Div. of History of Science and Technology, KTH
Johan Gribbe	Div. of History of Science and Technology, KTH
Kajsa Klein	Dept. of Journalism, Media and Communication, Stockholm University
Ebba Larsson	The Swedish Computer Society
Sofia Lindgren	The Swedish Computer Society
Mikael Nilsson	Div. of History of Science and Technology, KTH
Anna Orrghen	School of Culture and Communication, Södertörn University
Julia Peralta	Dept. of Economic History, Uppsala University
Gustav Sjöblom	Technology and Society, Chalmers University
Crister Skoglund	School of Culture and Communication, Södertörn University
Björn Thodenius	Center for Information Management, Stockholm School of Economics
Mats Utbult	Arbetslivsjournalisterna

Group for the Administration of the Material

Peter Du Rietz (chairman)	The National Museum of Science and Technology
Ellinor Algin	The National Museum of Science and Technology
Martin Lindberg	The National Museum of Science and Technology
Anne Marcusson	The National Museum of Science and Technology
Peter Westerberg	The National Museum of Science and Technology

Project Secretary

Sofia Lindgren* (secretary)	The Swedish Computer Society
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* Lindgren replaced Cecilia Calmfors in 2007. Calmfors had earlier replaced Åsa Hiort af Ornäs.

Focus Groups

Early Computers

Lars Arosenius, Bo Lindestam, Tord Jöran Hallberg, Gunnar Holmdahl, Stig Holmberg, Thomas Höglund, Kurt Katzeff, Per Lundin, Gert Persson, Per Olof Persson, Pär Rittsel, Gunnar Stenudd, Gunnar Wedell

Healthcare

Isabelle Dussauge, Bengt Olsen, Hans Peterson, Urban Rosenqvist

Financial Industries

Banking: Rune Brandinger, Bengt-Åke Eriksson, Sture Hallström, Per Olof Persson, Fredrik Runnquist, Anders Rönn, Björn Thodenius

Insurance: Olli Aronsson, Perlof Axelson, Göran Carlsson, Anders Kleverman, Per Lind, Göran Lindberg, Per Olof Persson, Björn Thodenius

Manufacturing Industries

Jan af Geijerstam, Kurt Gladh, Peter Lundh, Bernt Malmkvist, Per Olof Persson, Mats Schedin, Anders Svedberg, Ingvar Söderlund

Information Technology Industries

Lars Arosenius, Gunnar Hesse, Per Olof Persson, Gustav Sjöblom, Anders Skarin, Thord Wilkne, Gunnar Wedell, Viggo Wentzel

Systems Development

Janis Bubenko, Harold "Bud" Lawson, Per Lundin, Tomas Ohlin, Lars Wiktorin, Ulf Åsén

User Organizations and User Participation

Klas Barklöf, Peter Docherty, Birgitta Frejhagen, Lars Ilshammar, Ove Ivarsen, Cecilia Katzeff, Kajsa Klein, Lennart Lennerlöf, Per Lundin, Jenny Maniette, Christer Marking, Bengt Sandblad, Cecilia Sjöberg, Crister Skoglund, Yngve Sundblad, Per Tengblad, Peter Ullmark, Mats Utbult, Åke Walldius, Gunnela Westlander, Anders Wiberg

Transports

Roger Bydler, Dag Ericson, Esbjörn Hillberg, Bo Midander, Anders Rydberg, Per Olof Persson, Gustav Sjöblom, Rune Svensson, Ingvar Söderlund, Bengt Wennerberg

Defense

Jonas Agerberg, Tomas Ahlberg, Ingemar Carlsson, Helge Gard, Johan Gribbe, Sigurd Håkanson, Malte Jönson, Gunnar Lindqvist, Sven Olof Olson, Gert Persson, Gert Scyborger, Carl-Olof Ternryd, Bertil Wennerholm, Christina Winblad

Public Administration

Olli Aronsson, Göran Ernmark, Dag Osterman, Julia Peralta, Gert Persson, Per Olof Persson, Nils Qwerin

Telecommunications

Göran Kihlström, Per Lundgren, Mikael Nilsson

Higher Education

Ingemar Dahlstrand, Sofia Lindgren, Julia Peralta

Archives, Libraries and Museums

Sofia Lindgren, Anna Orrghen

Media

Peter Blom, Mirko Ernkvist, Lars Kjell Dahl, Sofia Lindgren, Anna Orrghen, Pär Rittsel

Schools

Martin Emanuel, Ulla Riis

Retail Industries

Rolf Holmberg, Per Olof Persson, Gustav Sjöblom