Research on IT use and users in Sweden, with particular focus on 1990–2010

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Hans Fogelberg
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Introduction

Context to this overview

This overview has been conducted within the context of an earlier historical project on IT implementation, as well as the aim to develop a new project that focuses on IT use in Sweden.

The first project (Från matematikmaskin till IT), which covers the period from the 1950s to the 1980s, has been finalised in terms of collecting structured data and documenting actors’ retrospectives from past development. That project generated data from a group called ‘elite users’, a term that refers to the various experts who were active in system design, implementation and diffusion of IT in Sweden between 1950 and the mid-1980s. The aim was to generate representations of a development of the past through the memories of key persons from that time. This was achieved through the use of structured ‘witness seminars’, which were recorded and transcribed, complemented with various other methods, such as autobiographies, all with aim of generating researchable textual data about this period. The resulting material, which is quite extensive, is now available at ithistoria.se and on the Tekniska Museet website. The final report (Lundin, 2009) also includes a short research overview, which concludes that no Swedish historians have, to any large extent, focused on the role of computers in society. The major research themes identified by Lundin fall into three categories: (1) computers and politics, (2) main-frame computers of the National Board for Computing Machinery (Matematikmaskinnämnden), and (3) various interdisciplinary studies that have been evaluated as being more about developing economic or sociological theories than about describing and understanding the historical role of computers in society (Lundin 2009, pp. 8ff). Lundin’s note on earlier research has indicated that there are weak spots in the research.

There is probably a need to delve deeper into the literature from the first period, especially with respect to finding research about also ‘common’ users from this time. From at least the 1970s onwards, there has been a development towards user-focused implementation studies in the so-called Scandinavian School of systems design. Also, the initiation of the Arbetslivscentrum centre and the development of a general Swedish ‘user-centred view’ are important developments. However, assuming that a more thorough overview of earlier research will not fundamentally change the picture presented in Lundin (2009), it is safe to conclude that historical analysis that integrates technical and social description is either delimited to a few specific computer developments, and that earlier research is largely silent about technology and focuses only on political or theoretical aspects. The question, then, becomes the extent to which the new data from witness seminars solve the identified lack in the previous research of the first period. It seems to have provided high-quality data and guidance for historical research. To a lesser extent, perhaps, it provides the complete data that will help fill the gaps in an historical research agenda on IT.

The second ‘project’ context within which this overview is situated (När alla blev användare) aims to study the period from 1990 to the present (that is, about 2010). This project represents the aim to prepare for future projects or a larger programme on historical research into IT use. While such a project is, in one sense, a continuation of the first project, the multiplicity of users and uses and the large number of people and institutions that
implement ICT in Sweden in this period makes it difficult to continue with the same approach and methodology. Therefore, the present literature overview has not formulated a group of ‘elite users’ that is parallel to that of the earlier study (cf. Lundin 2009 on the notion of elite users). Arguably, however, it is possible in principle to find a translation for the term ‘elite users’. The earlier rationale for a focus on elite users was a ‘now or never’ situation; it was felt that there was a lack of data about a past period, and data was collected without having a specified research question in mind. It should be remembered, however, that implementation is not simply a completed ‘phase’ that ended in the mid-1980s, since which time we have just ‘used’ IT. Implementation is an ongoing development and is probably much more intensive now than earlier. New uses, diffusion of new technology, and the co-evolution of technology development and use develop in very short time-frames. In a sense, technology is diffused ‘everywhere’ and the qualitative change of this quantitative diffusion has only started (cf. Gossas & Lundqvist 2009). These developments are the result of large-scale implementation that has many facets. There has been substantial diffusion of copper, fibre, hubs, 3G masts, and broadband nets in apartment, houses and cities. This on-going development is not self-propelled. A number of modern ‘elite users’ in the more recent period could also be approached using witness seminars. However, now that the urgency of the matter is not so much that they are old – also bearing in mind that this community is now much larger – a general view has been that more solid historic research questions should guide data sampling.

Thus, instead of elite users, the new project and this overview primarily concerns the history behind the widespread use of ICT, which is undoubtedly a phenomenon that became manifest during the 1990s.

Table 1: Relationship between the documentation project (phase 1, 1950s-1980s) and the literature overview of this project (phase 2, 1990s-2010)

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td>Group</td>
</tr>
<tr>
<td>Elite users</td>
<td>Expert</td>
</tr>
<tr>
<td>Common user</td>
<td>You, me, society</td>
</tr>
</tbody>
</table>

Many of the elite users from earlier studies were experts who designed and/or helped to implement ICT systems in organisations and society. The present overview focuses more on ‘mundane users’ and common use, which indicates the impact of ICT on everyday life. This focus on ICT as a common technology, or in Phaffenberger (1988) sense of a technology that becomes a ‘total societal phenomenon’, means that ICT is omnipresent in society as a material, social and symbolic fact (cf. discussion about omnipresence in Gossas & Lundqvist 2009). It follows that there is a need for a comprehensive overview of earlier literature. However, the consequences of something being almost everywhere and a reality of everyone need to be handled. In almost any conceivable academic field, there has been research that is more or less relevant to a broad formulation of research on ICT use. The knowledge interest of ‘how everyone became a user of ICT’ in Sweden is, in a sense, too broad a definition to delimit a research agenda. This implies that decisions have to be made about what topics, areas and aspects should be made part of literature overviews and future historic analysis.
Say “I do user research,” and many researchers from many fields doing a lot of different things will respond “So do I!” and as you start talking, it may well turn out that you have absolutely nothing in common (Hektor 2001: 2).

Research on IT is a widespread academic topic, partly because it is a multi-faceted phenomenon. Rob Kling, one of the more knowledgeable persons in the field, realised this quite early on: “There are tens of thousands of settings in which people and organizations computerize; these vary in social scale, ecology of social interests and their balance of power, relevant ideologies, technical and economic options, and so on. We therefore have trouble assembling a credible composite historical portrait of the links between computerization and the larger social order” (Kling 1991: 343). Another reason, at least in the Swedish context, is that first ‘computers’ and later ‘ICT’ and the ‘Internet’, have been societal and political topics and concern. This longer political and societal interest has resulted in governmental commissions, and research agencies and research programmes have funded investigations in this area. For non-Swedish readers, it should be noted that the Swedish research system is exceptionally reliant on external funding and that changes in policy translate directly to what research is actually performed. IT research has primarily taken place in the area of engineering. However, for historical reasons, a far from insignificant amount of research has been conducted by researchers from the social sciences and humanities. This point will be looked at again later.

This overview aims to provide a picture of academic research (social science and historical) rather than more general knowledge. A large number of reports have been made by, for example, IT commissions, various government institutes and several other research institutes. A decision was made not to try to map out ‘everything’ or most of the relevant contributions of pieces of knowledge. The lexical ambition of this overview was reduced considerably after a first mapping of reports from research agencies, institutes, public records, and so on. This body of research was found to be extremely large and each trail led to even more publications. Because of the large body of literature, a decision was made to focus primarily on research publications rather than report publications or books aimed at a broader public. To the extent that the analysed literature has given research publication status to reports, this also qualifies these reports for the present overview. However, the more narrow focus on peer-reviewed research publication still made it necessary to wade through a large body of literature. Consequently, it has not been possible to devote adequate attention, space and representation to the richness of each research field, researcher or their publications. My ambition has been to give each field an honest reading, but it is possible that not all researchers from any of the many fields will feel completely satisfied.

1 The acronyms IT (information technology) and ICT (information and communication technology) have corresponding Swedish acronyms, IT (informationsteknologi) and IKT (information- och kommunikationsteknologi). In almost all cases, these acronyms are used interchangeably and do not really mean different things in most of the studied literature.
The study used traditional methods of mapping research in university library database search engines. The Google Scholar search engine was also used to trace titles and authors, which in many cases led to a visit to the home pages of institutes or individual authors and publication lists. Another commonly used method in this overview was reliance on the previous research section of dissertations from various academic fields. These paint a picture of the relevant work. These trails are then followed using the snowballing method. While a weakness of this method is that the starting point becomes important for what research community you find, it was still seen as helpful in finding literature.

Since the number of publications of potential interest increased more rapidly than I thought it would, the actual reading of research had to be complemented with some other type of mapping activity. I opted for a soft version of bibliometric analysis of previous research on IT, ICT and Internet in Sweden. Scopus was searched on journal articles by Swedish authors that use the term ‘ICT’ in the title, abstract or key-word fields. However, this provided only 71 articles, distributed over 62 journals, which meant that very few of these authors had more than one article in a particular journal (based on the Scopus search). It also meant that it was not possible to identify any clustering around particular journals, and no research group clustering was identified since authors were distributed geographically in 26 different universities or other academic institutions. A similar search using ‘internet’ as a search term provided about three times more hits but resulted in a much more heterogeneous count, with a smaller share of articles being relevant to the overview. A larger and more thorough bibliometric analysis was conducted using the social science databases of Web of Science (reported in Jarneving 2011). Swedish authors in international journals were traced using the term ‘Swed*’ in the title, abstract or keyword, in combination with search terms related to IT use. This analysis of a first cohort of publications led to the following preliminary results (counts): internet studies 109, information technology 90, telecom 18, ict 31, internet user 9, computer technology 13, e-government 13, information society 13, informatics 3, cscw 2, mobile information technology 1.

An initial reflection is that these are very low numbers, both in total and for specific subjects, such as CSCW (computer supported cooperative work). The imbalance becomes even more obvious when it is noted that a portion of the articles are in the field of health and medicine rather than social science. If interdisciplinary databases are included, the number of such articles increases drastically. A ‘manual’ mapping of publications from Swedish research institutes and larger research programmes indicated a large number of studies on IT, especially in the area of informatics. On the other hand, analysis of publications from research institutes also reveals that these publications are usually not about Sweden or that this is not explicit in the text (or traceable through bibliometric analysis). The same is also true for the limited number of international research articles in informatics that I have studied more closely. The bibliometric method has limitations for mapping out IT research. Jarneving (2011) concluded that only a limited portion of the Swedish production of social science publication on IT appear in the WoS database. The analysis below is made on the articles that did appear in WoS. The first figure describes the relative role of different journals and closeness.

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Scopus search string was: TITLE-ABS-KEY(ict) AND AFFILCOUNTRY(sweden) AND DOCTYPE(ar) AND SUBJAREA(ARTS OR SOCI OR BUSI OR MULTI OR COMP).
Figure is adopted from Jarneving (2011).

The second figure describes citation links. Several Swedish authors appear, and the role of Castells is obvious. In fact, Castells is an almost mandatory reference in the Swedish IT studies I have examined. Apart from the cluster in the upper-right corner, there is an interesting link to (economic) innovation studies in the lower and left sides of the image. However, historical innovation studies are largely absent.

Figure is adopted from Jarneving (2011).
The reason for the relative invisibility of Swedish IT studies is related both to the characteristics of databases such as WoS and to publication behaviour. Social scientific research in general, and humanities in particular, are not well represented in major databases, such as Web of Science and Scopus. In 2009, for example, when all publications submitted to the GU database were compared with the representation of this research in the major databases, the result was disappointing.\(^3\) The hit rate was 5–11 percent in WoS, 4–12 percent in Scopus and 18–29 percent in Google Scholar. The low hit rate of the social sciences and humanities in databases such as Web of Science and Scopus is explained by the publication tradition of these disciplines in comparison to, for example, natural sciences and to the fact that WoS is article-heavy and does not include books, dissertations and various other types of publications. The Google Scholar database has better coverage of the variety of publications in social science, and especially of history disciplines, since it basically just traces online content such as university publication databases. On the other hand, Google Scholar counts many publications that do not represent peer-reviewed high quality research, which makes it difficult to separate these from other publications. Therefore, in the case of Web of Science and Scopus, the problem may arise of under-representation of the sought-after research and, in the case of Google Scholar, a probable over-representation of publications other than high standard quality publications. Assuming this general pattern is also true for IT research, there is a methodological problem for mapping IT research using bibliometric analysis.

Attention now turns to the qualitative method used in this overview. With respect to the analysis of single publications, this task has been approached in the following manner. Each contribution was read and evaluated using a few heuristic questions (which are not at all specific to the subject of IT). The first question is about the research interest and problem or phenomenon that the text aims to inform. This is often a mix between a ‘societal issue’, which is typically a contemporary discussion in the public sphere, and concerns and formulations of this issue within a disciplinary academic context. If forced to identify the most important of the two, the public debate could be said to be the crucial one. It is clear that public debate, in which some researchers actively participate, structure how the field of ‘IT studies’ develop. A second question asked of the analysed text concerns perspective and methodology. Here, the home department of the researcher clearly makes a difference. However, there are also important overlaps between disciplines, especially in social science. Similar perspective or theoretical inspiration can be found in very different academic milieus (such as departments for computer science, informatics, sociology, or media studies). This is probably the result of the fact that ‘IT studies’ have also developed their own interdisciplinary characteristics and boundaries. IT research is often conducted in inter- or multi-disciplinary research environments (institutes, projects, etc.) in which the disciplinary belongings may have a relatively small impact. Conducting research on IT involves being part of specific professional academic communities of IT researchers that, in the words of Knorr-Cetina (1999), develop a partly separate ‘epistemic culture’. This is also evident from the number of dedicated but inter-disciplinary journals that deal with various aspects of IT development and use. The third question pertains to something that is not usually made explicit in individual journal publications; namely, the empirical case and data. While, for

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\(^3\) Source: Karin Henning at the University of Gothenburg. This example discusses all research areas and not only IT.
example, a single dissertation usually formulates its aim and contribution at an abstract or conceptual level, the important aspect for this overview is what is actually researched, described, and brought to the surface in the form of empirical data. Since the underlying knowledge interest is historical, this may even be the most important dimension in the research overview. For example, it could be the case that different publications study the same or very similar empirical material, just from slightly different perspectives. If so, the overview should reveal this. Finally, the analysis aims to describe the major findings of each contribution with respect to the research interest of this overview. This does not necessarily mean that the stated conclusion of each contribution is referred to, only that the part that is close to the aim of this research overview is described and commented.

**Meta-theoretical devices**

Meta-theoretical concepts are usually helpful and a few concepts are used here that are seen as important to an historical aim. The notions of internalist-, externalist- and contextual historical analysis are familiar meta-historical concepts in the history of technology (cf. Staudenmaier 1985, Roe and Reber 1989). Externalist studies rely on social analysis of technology but do not attempt to describe the details of technical change or explain the workings of technology and its respective technical ‘content’ (Staudenmaier 1985). With respect to the present overview, externalism can be described as a lack of description of ‘IT’ in IT studies; a problem that has been well described by Orlikowski and Iacono (2001). In an externalist account, IT is simply an acronym or shorthand for a change that is not really described. Internalist studies, on the other hand, perhaps pay too much attention to the ‘internal’ aspects and changes of technical artefacts or a technical system. Social change is implied but not studied. While social data may also occur in internalist descriptions, it is not used to explain the technical development, or it is used only to explain why technical development fails but not why it develops successfully. This is known in history and sociology of technology as ‘asymmetric’ explanation and is usually something an analyst strives to avoid. This is why success and failure should be analysed using the same type of explanation, and why both successful and not-so-successful developments must both be studied. The contextual tradition or, rather, the contextual ambition (because it is an ideal) was proposed as a way to avoid the imbalance of both internalist and externalist descriptions. In the history of technology, this was formulated as the ‘seamless web’ argument (cf. Hughes 1986), and the same concern was expressed in the sociology of technology (cf. Bijker 1995). Contextual analysis seeks to link the description of technical development with a description of social change. The concepts of ‘seamless webs’, ‘systems’ or ‘networks’ became ways for analysts to handle the two-way causal relationship between technology and society development. The web-system-network framework of analysis was specifically designed to cope with co-production phenomena. Kling (1991) argued that detailed contextual studies are crucial to any analysis of ‘IT and social change’ since it undermines simplistic expectation of a social transformation as a result of IT development.

Therefore, the above-mentioned concepts relate to three other well-known concepts: technological determinism, social determinism and co-production. Technical determinism is often noted as being a common aspect of public or political IT discourse in the sense that ‘IT’ is seen as a pervasive phenomenon and development, with its own logic, which will transform society
and how we live. Almost all of the social studies examined below acknowledge this view and take a sceptical opinion of such simplistic and deterministic idea. The social sciences and humanities have commonly refuted technical determinism, however basically, by promoting another deterministic idea, that only social or political factors determine the development. Analysis, then, leans towards social determinism, where technological development is seen as the sole result of political decisions, institutions or social groups. This is usually accompanied by ‘black-boxing’ of technology in the sense that no detailed descriptions are given of technical change (cf. ‘mild’ constructivism). The notion of co-production, on the other hand, binds social and technical change together (cf. Hughes 1986, Callon and Law 1989, Latour 1987). Co-production perspectives do have downsides, but one of the more interesting positive aspects is that it becomes possible to combine producer-, user- and design-centred descriptions and analyses (cf. Oudshoorn and Pinch 2005). It is possible to describe change processes where the dichotomy of user/producer breaks up. Central theorising in that direction is promoted by, for example, Woolgar (1991) and von Hippel (2005). It is both an interesting and challenging task because it seeks a fluid and non-conventional definition of ‘user’ and ‘producer’. The development of a historically informed conceptual framework of the user/producer dichotomy may be a project for future research.

Earlier overviews of IT research

The present report on IT research is, of course, not the first attempt to grapple with Swedish IT. In their book entitled Users in Action. Stories of Users in Everyday Life, Karlsson and Östlund (1999) distinguished among three relationship levels between technology and use in earlier ICT research. Level I is represented by studies of the design of technology or technical artefacts (e.g., ‘design of the TV set’). The pertinent research questions at this level relate to technical improvement of user categories of this technology. The main disciplines are found in the area of computer science and behavioural sciences. Level II is represented by research into the use of technology or artefacts, with research questions that pertain to the meaning of ICT for users and organisations (e.g., ‘watching TV’). The main disciplines and perspectives at this level are systems theory, economy and organisational studies. Level III, which concerns the societal and cultural context of technology (‘technology and society’), promotes research questions regarding the social consequences of using technology or of the mechanisms of technology development and diffusion. The disciplines are described as social science in a broad sense, in which the engagement of individual researchers from different disciplinary origins are common (e.g., sociology, ethnography, etc). The first research ‘level’ is not included in this overview since it concerns cognition phenomena of technology with a focus on the individual, or on the interface between individuals and technology. In this sense, level I is not about social or historic phenomena. Level II is partially relevant because of its clear focus on the use of ICT in relation to organisational activities; perhaps the primary example is studies of ICT in the field of work science. Karlsson and Östlund (1999) noted that level III is a stream of research that positions technology development and diffusion of ICT in a social and historical perspective. This is also the primary interest and focus of the present overview.

This distinction between three types of research is a stepping stone for Östlund’s (2000) research overview, entitled Svensk forskning om användning av informations- och
Östlund’s overview, which is based on interviews with contemporary IT researchers, pointed out several important research trends from the late 1990s. One such trend was the move from narrow human-machine-interface (HMI, level I) framing to an understanding of ‘use’ as a contextual process. In the words of Östlund: “user-oriented research has moved from a focus only on how [presumed] correct information about users allow for technical optimisation, to an interest on how people negotiate and interact with technology [more generally]. In other words, research about use has become a more qualified, complex and multi-faceted field” (Östlund 2000: 19, my translation).

Another trend in researchers’ conceptualisation is expressed as a need to distinguish between studies of existing use and studies of possible future uses of ICT. I feel that Östlund’s strategy was to preserve a space for academic research, primarily in the area of a focus on existing ICT use. Östlund warned about the more far-reaching consequences of the fact that the Swedish research into ICT use had developed a lack of historical interest and a lack of solid theory. According to Östlund, the reason for this was that researchers are overly focused on keeping pace with the rapid changes in uses of technology.

Now, 10 years later, there is still a lack of historical studies. The research system did not promote historical research. The political system used research institutions as tool in the implementation of IT. Because the meaning of IT as inherently efficient wherever it is applied had become a social fact and part of the ideology of implementation, there was little interest in policy for historical studies about the actual outcome of implementation. In the context of KFB, even Östlund (2000) find no room to promote historic contextual studies. The contextual approach was primarily outlined for contemporary research and future longitudinal studies. The new research programme should record two new phenomena: (1) the new inroads of ICT in domestic milieus, and (2) the new and increasing use of mobile ICT. The fundamental problem remains; namely, a long Swedish research tradition and agenda that prioritises studies of recent or future change, rather than developing a solid contextual (including historic) understanding of use and implementation.

### Mapping of policy and research policy programmes

#### Policy for IT use

Most technologies that are developed and diffused in society do not become the subject of long-term political discussion and detailed planning for its development and diffusion. ‘IT’ is one example of a technology area in which the state takes a proactive and direct role, and in which politicians engage in detailed discussions on development and implementation. While Sweden and other relatively small countries have not participated in the frontline of research

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4 For a comparison of US user research, see Hektor (2000).
5 For an overview of earlier research on IT use in educational contexts, see Riis (2000b). A parallel contribution to that of Östlund for KFB is found in Atlestam (1995 and 2004) for the technology policy actor NUTEK.
and development of IT as a basic technology field, Sweden has been at the frontline of development of use and diffusion. This was a result of the state playing a role that was, internationally speaking, quite active (Glimell 1989). One way to describe this activity is by mapping the various technology policy initiatives. An active role of the state is usually accompanied by a host of policy initiatives. IT development became a political subject, through a number of public investigations and commissions, and some of the resulting policy initiatives are described below.

Johansson (1993) describes the first major political activities in IT, which had links to military technology development and a concern about having access to advanced computer components. From 1947, Matematikmaskinnämnden organised the design and production of the first Swedish computers (called Bark and Besk). This development was initiated by two military government agencies, one military technology development agency and one intelligence agency (Foa and Försvarets Radioanstalt). In 1955, a new actor was created – Kommitten för maskinell databehandling – which became a de facto policy actor for computer development during the 1960s. This committee was followed by the Svenska Databehandlingskommittén, the primary objective of which was to develop the use of computers for civil purposes in administration and office context (SOU 1962:32). According to Glimell (1989), the state promoted diffusion in the 1960s, industrial concerns were raised and new policies for development were developed in the 1970s. Ilshammar (2002) suggested a different perspective on phases of development. In the first phase (1970–1982), the state promoted an IT policy governed by a concern of ‘consequences’ for society. The second phase (1983–1993) was dominated by policies aimed at the ‘development’ of IT. The third phase (1994–1998) was a period of policy for the ‘diffusion’ of IT. Other important policy activities were Dataeffektutredningen (SOU 1984:20), Data- och elektronikkommittén (DEK) and Datadelegationen. Datadelegationen was first to acknowledge that IT had become part of all ‘sectors’ of society. Glimell (1989) described how the political ambition of Datadelegationen was separated in a total of 108 ‘aspects’ of IT development, diffusion and use in which the state had a role to play. A primary role was linked to defence. The impetus for development programmes in the early 1980s was military in nature and was linked to the need to supply advanced electronic components to the new JAS fighter. However, the subsequent IT programme from the mid-1980s also had strong civil dimension and rationale. This is a Swedish example of policy in the era of state-financed ‘large programmes’, which are policy that has been studied in other European contexts by Mustar and Laredo (2002). In the late 1980s, ‘users’ and ‘use’ arose as important development logic and rationale for state involvement. For example, Datadelegationen investigated the use of computers in households. A major policy actor was the IT-kommissionen (1994–2003), which in 1994 produced a report entitled Vingar åt människans förmåga (SOU 1994:118) and a government bill in 1995 entitled Åtgärder för att bredda och utveckla användningen av informationsteknologi (prop. 1995/1996:125). These were followed in 1999 by a report of the commission entitled Bredband för tillväxt i hela landet (SOU 1999:85) and the government bill Ett informationssamhälle för alla (prop. 1999/2000:86).

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7 For a view on the development in the 1960s, see also Annerstedt et al. (1970), Bäck (1982) and de Geer (1992).
Even though this policy overview is by no means complete (it relies on the descriptions found in various dissertations and articles), it still indicates that the involvement of the state has been substantial. This material is a type of data that has been covered by earlier research. Most social scientific dissertations start with or relate to this policy. Even though important work has been done, I feel that a more thorough and comprehensive description of the whole period will probably give new and interesting insights both to IT history and to the relation between this history and national security politics and growth.

Research policy for social and historical studies of IT use

One way to create an understanding of interdisciplinary and heterogeneous research field is to analyse research policy through the programmes of various research agencies. Studies of IT use do not appear in an institutional vacuum; there is always a knowledge interest expressed by funding patrons. In terms of research, this is usually expressed in changing focus areas and goals of research calls of agencies. The present study originally sought to map the major activities of the research funding actors with respect to ICT use studies. However, two things prevented this from happening. The first was that the total amount of material turned out to be much larger than anticipated – ‘IT’ seems to be a favourite subject of research policy. Secondly, some earlier agencies have been terminated and the project catalogues of these agencies are difficult, or at least time-consuming, to analyse. This means that the description of research policy, as outlined below is biased towards information that is comparably easy to find and map. Several accessible research agency and government agency databases were searched and the method was a manual selection of relevant projects in project databases selected by reading all project descriptions. The concluding section of this overview suggests that a more comprehensive mapping and analysis of Swedish research policy in IT studies is one task for future research.

It is difficult not to start an overview of research policy with the Swedish National Board for Technical Development (STU). In the early 1980s, STU funded competence-enhancing programmes that aimed to develop education and research in technical universities in areas relevant to IT. In the planning phase of a new national IT programme, the state envisioned three pillars of IT research: hardware development, system engineering, and research into the use of IT. The first two objectives were developed as engineering-focused education, research and development policy through two large programmes: the 700 MSEK large National Programme for Microtechnology (Nationella mikroelektronikprogrammet, NMP 1985–1990), and the National Programme for Information Technology (Informationsteknologiska programmet, IT 1986–1992), which consisted of four sub programmes, IT 1–4. For IT4 in particular, industrial development and demonstration was designed to be a large programme and included the work and interest in this new technology from different organisations, including FMV, Televerket, ABB, Ericsson, Nobel Industrier, Saab-Scania and Teli. Most of the actual work in these programmes was engineering research and industrial development, neither of which focused explicitly on the user (Glimell 1989). Instead, to some extent, user research emerged from another programme and context, the Development Programme (Utvecklingsprogrammet, UP 1983–1987), which aimed to develop learning in work contexts. One of the conclusions from that development was that the more advanced technology is in a work context, the more ‘the user’ becomes a central aspect for
implementation. This was seen as being particularly true in the case of IT, which at this point in time was considered an advanced technology. This led to a focus on users in Människa-Datateknik-Arbetsliv (MDA), a six-year (1987–1992), 64-MSEK interdisciplinary research programme that was funded by Arbetsmiljöfonden and NUTEK (NUTEK came after STU was terminated). This programme engaged as many as 125 researchers from the fields of engineering, social science, and humanities. The aim was to bridge the gap between hard and soft sciences in IT research and to establish a new interdisciplinary academic field that focused on IT design for better work content. An overview of the programme is provided in Utbult (1993).

In 2000, the ‘STU portion’ of the subsequent NUTEK was integrated with the Communications Research Board (KFB) and the Swedish Council for Working Life (RALF) to become the Swedish Governmental Agency for Innovation Systems (VINNOVA). This agency developed into a major innovation policy actor in Sweden, funding innovation development and technology development projects, some of which are social scientific. One important difference between VINNOVA and its ancestors was that VINNOVA had a stronger focus on economic growth and the creation of new markets and industrial sectors; ‘IT’ clearly ranks high for such an agency and agenda. VINNOVA organised not only engineering research in ICT but also user-oriented IT research through a number of large research programmes on IT use, which include the programs: Tjänsteproduktion och IT-användning – favorIT, IKT-användning and the development programme entitled IT för sjukvård i hemmet. In addition, VINNOVA co-funds several research programmes, including Citizens’ Services, e-Government, e-Health, Living Labs, Var Dags IT, Visualisation, Sectorial research for IT and telecom. Almost all of these programmes include research projects that are potentially relevant to this overview. However, since VINNOVA has a very strong bias towards development, innovation and growth, the above-mentioned research programmes, some of which are quite large, should not be interpreted as evidence of a fertile ground for social scientific or historic research.

The Swedish Council for Working Life and Social Research (FAS), which was established in 2001, also funded IT use studies. However, only half of the approximately 15 projects selected for their potential relevance relate to IT use in the sense of this report. Several projects do not qualify here because they are concerned with the use of the Internet for cognitive treatment and therapy.

Many large programmes originate from one particularly important research actor. The Knowledge Foundation (KK-Stiftelsen) was created in 1994 and developed to become a central funding agency for IT research in the Swedish system. The background was that three large research foundations were created based on the so-called Wage Earner Funds that existed in Sweden between 1983 and 1991. These (very large) funds were used to lay the ground for several large research actors in Sweden. The three largest foundations are SSF (strategic research), MISTRA (environmental research) and the Knowledge Foundation (development of knowledge and learning). Together, these foundations had an estimated market value at their initiation of 23 billion SEK. The Knowledge Foundation was created with three primary objectives: to fund research at the universities that had recently been

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established in various parts of Sweden, to create interaction between academia and industry, and to support the use of IT. As a result, IT research became a comparably strong research subject for the new universities in Sweden and this can also be traced in research projects and publication patterns. While the larger and older universities do have strong IT research components, the smaller universities and institutes were given the resources they needed to take a comparably large portion of the Swedish IT research portfolio. The KK Foundation particularly initiated IT activities in the areas of education, learning and organisational development. And the foundation established a new programme that aimed to research the development it had initiated. This formed the background for the establishment of a larger research programme from 1999 on learning and IT, called Lärande och IT (LearnIT). This programme focused on three areas in particular: IT and society, IT and the organisation, and IT and the individual.9 Between 2000 and 2009, and at a total cost of 128 MSEK, the LearnIT programme created 47 research projects, many of which were doctoral student projects. Among other things, it resulted in 25 dissertations and 53 articles published in international academic journals (Aasen et al. 2010, programme evaluation report). The implementation of the LearnIT programme is one explanation of why there are so many dissertations and researchers active in the area of IT and learning. Several contributions from this programme context are also included in the present research overview. The Unga närkulturer research programme is a more recent programme from the KK Foundation, which currently includes nine comparatively large research projects on topics such as gaming, cyber norms and entrepreneurship.

An analysis of the project catalogue of the Research Council (VR) points at 17 relevant projects in the humanities and social science category since the agency was created in 2001 (the project catalogues of the precursor to VR are still to be analysed). The projects focus on subjects such as gaming, gender, simulated meeting places, etc. The most visible and largest funding of IT research by the Research Council is within the Linnaeus Centre programme mechanism. The Linnaeus programme, which originates from government proposition (prop. 2004/05:80), was established with the aim of creating strong environments for basic research. There are currently 40 Linnaeus centres running in Sweden, seven of which have an explicit or implicit focus on engineering the next generation of ICT technology. However, LinCS is the only purely user-oriented IT project within the Linnaeus programme mechanism. The Linnaeus Centre for Research on Learning, Interaction and Mediated Communication in Contemporary Society (LinCS) was established in 2006 and is funded with 5 MSEk per year for 10 years.

Several research agencies and institutes have not here been mentioned or studied.10 Nonetheless, this admittedly limited description of the Swedish research policy for research

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9 These themes were organised in a number of projects. According to the LearnIT website, its current projects include: Digitala läromedel, Expertkompetensprogrammen, Folkbildning & IT, GLIT-programmet (jämställdhet, genus & IT), IT & lärarutbildning, Internetanvändning, Kunskap, medier och AI Online Learning Communities (OLC), Retorik, lärande och IT, Uthållig IT-utveckling.

on IT use still indicates that IT has been a significant research policy topic and that changes in what are considered important societal topics for IT policy are reflected in changes in IT research policy (and, therefore, in what IT researchers actually do and publish). Analysis of IT research policy are important part of the analysis of the expert-centred discussion on IT in a historical perspective.

Research institutes, reports and statistical surveys

A large portion of reports on IT use in Sweden are produced by governmental analysis agencies and research institutes. The Swedish Government Official Report (SOU) builds on such institute reports or contributions by researchers, one example is Amnå (1999), *IT i demokratins tjänst*, in which 10 Swedish IT researchers reflected on the subject of IT and democracy. Research agencies have produced primarily statistical and quantitative descriptions of IT use. The work of governmental agencies has taken place based on government commission and is primarily reported in reports that are part of an ongoing policy process. Examples of agencies that have produced such reports are *Institutet för tillväxtpolitiska studier* (ITPS), which produced about 40 reports, and the subsequent agency, the *Swedish Agency for Growth Policy Analysis* (Tillväxtanalys), which has so far produced a smaller number of reports in this area. Also *Post och Telestyrelsen* has conducted investigations (see e.g. *Post och Telestyrelsen 2000*). The Swedish Institute for Transport and Communications Analysis (SIKA) has conducted studies of ICT use since 1996 in an annual *Swedish National Communication Survey*. This survey generates statistics of ICT use in the Swedish population and maps use in relation to spatial movements of several thousand people during a particular (individual) measurement day for data collection. Two particularly important trends have been identified. The first is that ICT use varies by age more than by any other factor. The 2003–2004 survey shows that close to 100 percent of people aged 15 to 24 used a computer, surfed the Internet and sent an e-mail during the day. Significant levels of use remain until about 60 years of age, after which it drop rapidly. Another conclusion is that a dramatic increase in the use of ICT for communication has not really reduced the amount of travel. For example, during a period of one month, only 7 percent of the population used a telephone conference and only 2 percent used a video conference system (SIKA 2006). Statistics Sweden (SCB) has conducted annual statistical surveys of IT use, such as on the use of computers and Internet in private firms (see SCB statistics). Longitudinal statistical surveys of IT and Internet use are also produced by the NORDICOM institute and the SOM institute, both of which are part of the University of Gothenburg.

In addition to reports, research institutes also produce high quality academic articles. Relevant groups at these institutes include the Mobility Studio Stockholm at the *Interactive Institute*,11 the User Laboratory Group at the *Swedish Institute of Computer Science – SICS*,12 the e-Society group at the *Santa Anna IT Research Institute AB*,13 and the User Involvement

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project and the Open Platform for Nomadic Devices project at the Viktoria Institute. A large portion of this research is design-oriented user studies where informatics is a major or important research tradition. The production is impressive in terms of article count and has been difficult to analyse; nevertheless, one conclusion is that the emphasis in these research articles is not on Swedish development, history, or use.

**Studies of IT use and Swedish society**

*IT and politics*

The study of IT and society is the strongest and longest of the research themes. One theme is studies of IT and political processes. These studies point to the fact that political and public discussion about ICT rely on technological determinism. When technological determinism dominates or affects views about the logic of societal change, this alters the rules of the game in the political arena. Criticism of IT development becomes suspect and viewed as somehow being ‘against’ progress and economic wealth development. Acknowledgement of this problem is a starting point for many of the contributions of research grouped under this heading.

In a dissertation about IT, democracy, citizenship and integrity, entitled *Offentlighetens nya rum*, Ilshammar (2002) described how political images of the benefits that ICT has for democratic development in society sit uncomfortably with the outcome of the actual implementation of ICT. (A similar critical view is developed also in Olsson (2002), *Mycket väsen om ingenting: Hur datorn och internet undgår att formas till medborgarens tekniker*). The study by Ilshammar focused on the aspects of the formal political system using four case studies: the Data Act of 1969 (Datalagen), the Personal Data Act of 1998 (Personuppgiftslagen), the Cable TV Act of 1996, and finally the deregulation of the Swedish telecommunications system in the late 1980s. Although the stated perspective is science and technology studies, Ilshammar promoted a knowledge interest that is closer to political science and history. The data in Ilshammar’s study consists primarily of government commission texts, public documents, and interviews. One of Ilshammar’s major arguments is that the political practice of using ICT for democratic purposes has, in direct contrast to the expected outcome, led to reduced transparency and reduced access to important democratic arenas. One reason for this outcome was that the political system detected a state of urgency in IT, in which the Swedish system had to act rapidly, and important decisions were handed over to technical experts who could use their new influence to develop their partial interest in IT. Another reason is that the legal context of IT that was subsequently developed reduced some of the earlier

14 For example, in *Datamakt*, Kerstin Anér (1970) gave a personal but insightful account of the general discussion on computers and communication technology in contemporary Swedish society in the 1970s. She provided a view of how these issues were discussed in other international contexts, as well as a surprisingly broad and multifaceted overview that commented on virtually all modern issues of later studies. Other studies of the early period are Annerstedt, Jan, et al. (1970) *Datarr och politik: Studier i en ny teknikis politiska effekter på det svenska samhället*; Bäck, Mats (1982) *Datorisering och datapolitik*; Lindkvist, Kent (1984) *Datapolitiken i Sverige 1945–1982*; and De Geer, Hans (1992) *Vägen till datorsamhället: Datatekniken i politiken, 1946–1963.*
space and ability of citizens to act on democratic arenas. Access to democracy became an individual responsibility rather than a collective or societal responsibility.

Johansson’s (2006) dissertation entitled *Du sköna nya tid?* builds on and departs from a position close to that of Ilshammar. Johansson studied the formal political debate around ICT and broadband implementation in Sweden and Norway during the 1990s. Johansson used theory that emphasised the role of discursive struggles, the establishment of hegemonic views in politics and, from media studies, how ‘public images’ (samförståndsbilder) about ICT are being established in society. The Swedish data is about the political discussion on the development towards a Swedish Information Society. Johansson primarily used public documents from the 1990s that described views of different political parties. The material also included the work of the major official ICT commissions and their numerous reports. The national ICT roadmap, *Vingar åt människans förmåga* (SOU 1994:118) is a central material for the Swedish case study. An important background is the expectation of a pivotal change in society that is driven by ICT development; the expected inevitable epochal shift from ‘industrial’ society towards a post-industrial and ‘information-based’ society. The study analyse how this expectation become part of political debate and agenda. The studied discussions are partly grounded in collective (and internationally shared) public images of progress from IT. The study traces the Swedish and Norwegian national political reception and ‘versions’ of that broader international debate and development. The reception in Norway was more critical, as it also emphasised and included ‘soft’ political and social values, whereas the Swedish case displayed a political system occupied with economic growth issues that Johansson’s study termed ‘hard’ political values. Sweden developed a discursive field in which, essentially, all political actors subscribed to this general techno-optimistic view and expectation.

Public documents were empirical data also for Karlsson’s (2005) *Nödvändighetens väg*, which is a study of representations of information society as constructed in government documents. The data for that study was based on public government record from 1994 to 2004 that discusses information society or information technology. This study is more focused on ‘government expert reports’ than political documents. The study focuses on the underlying (technology deterministic) assumptions that make these images seem reasonable and true in a way that they can form part of political action. Karlsson used constructivist perspectives from the field of science and technology studies to analyse documents ‘as texts’ and, in this way, was inspired by the ‘linguistic turn’ in social studies. The study is also explicit with regard to the issue of limiting its object of inquiry to texts ‘in themselves’. The underlying (actual) phenomena of ICT implementation in Sweden and its role in society (that which the claims of experts represent) are not objects of inquiry. Karlsson found that worldviews can be separated into categories: the ‘objective’, which regards ICT as a creator of society or as a tool for progress; the ‘social’, in which ICT is represented in documents as a democratic project but is actually found to be technocratic; and the ‘subjective’ aspects, which found that texts constructed a positive image of flexible and change-prone citizens, while those who did not align were portrayed as laggards who prevented the required development. This

15 Basically, the material consists of public records (Offentliga utredningar, SOU, Protokoll, Motioner, Betänkanden, Skrivelser, Propositioner).

16 SOU, IT-propositioner, regeingskskrivelser publikationer i Departementsserier (Ds).
perspective shows that ‘information society’ is also a text-based activity in which these analysed documents form an important part of this constructed social reality. However, even though the benefit of text analysis is that it provides solid epistemology (that is, textual analysis of text with no external reference and no claim about external realities), the downside is that conclusions in principle say nothing about text-external social or material realities.

In *Facket, informationsteknologin och politiken*, Rolandsson (2003) contribute to this tradition of document studies. This dissertation is mainly situated in the sociology of work tradition, but it also demonstrates a strong political science dimension by providing an example of the handling of the topic of IT within a major and historically important actor of the Swedish Welfare State. The study analyse how the Swedish Trade Union Confederation (LO) responded to the issue of Swedish IT development and how it struggled to construct and stabilise a shared collective view on development. The study uses material from proceedings and reports of LO congresses between 1976 and 1996. The corporatist Swedish Model of development demanded that the work union achieve a balance between being a progressive force for development and preventing that this development led to unemployment or deskilled work. IT was initially treated like any other new technological change. With the diffusion of this technology, and by becoming a more general societal discussion, things also changed for the Union Confederation. During the period between the mid-1980s and the mid-1990s, it shifted perspective from treating IT as a traditional topic of ‘new technology’ for work productivity and impoverished labour (threat), to being seen as a more general concern of preparing its members for a coming information society era. The earlier threat of impoverishment was somehow extended to concerns outside the work context, emphasising the importance of educating wage earners in various IT skills. From this point, unions were a driver for IT use and education.

The diffusion of IT was a political concern that had to be handled at different levels. Sundqvist’s (2001) study entitled *Bredbandspolitik* studied IT discussions at the municipal level in the late 1990s focussing managers of municipal IT tasked with implementing broadband internet technology infrastructure in Sweden. Sundqvist’s study is based in social constructivist theory of technical change and use public documents from IT commissions and public investigations (SOU), in combination with interviews with municipal IT managers. At stake in the studied historic process is the balance between roles and responsibilities for implementation between public and private actors, between the state and municipalities, and between a ‘technology-neutral’ policy and a policy that demanded (chose) a particular technology (such as in the choice of fibre optics for broadband infrastructure in Sweden). It was clear to all involved actors that a denser broadband network (myggnät) that was capable of reaching all households in Sweden needed some form of subsidies or state support to be realised. Regardless of the choice made in technology or public-private balance, the municipal actors were expected to be crucial agent. In general, municipalities already had a grid that fulfilled the needs of the local administration and other types of local services, such as computers in schools. The new broadband demand of the state, however, required a different and much more capable technology, which meant new initiatives had to be taken and higher cost had to be allocated. Sundqvist’s study point to the fact that IT organisation and ownership structure vary substantially between studied municipalities, and that there was no consensus about what model of private, public, or private-public partnership that was preferred or seen as most efficient. Municipal IT managers were
flexible in their approach to and view of technology, and they also used different technology, different organisation and different ownership models. In this sense, technology did not stabilise or reach closure (cf. Bijker 1995) in one common form and norm.

Wihlborg et al (2003) study, entitled Kommunala bredband – Lokal politik för IT-sambället, analysed a similar process of IT at the municipal level. It focus on the implementation of a government proposition (Ett IT-samhälle för alla, prop. 1999/2000:86) from a municipality perspective. The study use a governance perspective combined with a socio-technical systems perspective. The empirical studies are based on web texts and documents describing municipal IT action plans available on the websites of 18 different municipalities. A smaller number of interviews were conducted with IT managers and consultants. Like Sundqvist (2001), this study concluded that municipalities tend to handle IT implementation in very different ways. IT development was interpreted as the issue of implementing municipal broadband infrastructure. IT became a topic of technicalities related to this implementation, whereas user-oriented concerns were not as important. Successful local system builders were primarily created around existing municipal public-private partnership cultures that were historically specific and differed between municipalities since they had been formed around earlier collaborations.

Another study of IT and politics is Smart, fast and beautiful. On rhetoric of technology and computing in Sweden 1955–1995 by Johansson (1997). The part of this dissertation that concerns the studied period is chapter 6, which describes the discussion of the implementation of ‘superhighways’ for information in Sweden during the first half the 1990s. The studied period includes the beginnings of the convergence of computer and telecommunication networks. However, this period still concerns the period before the Internet became a major formulation of information infrastructure in Sweden. Johansson’s theoretical foundation is in literature studies, which is combined with historical perspectives from science and technology studies. The study provides some information on technological frames and the relevant social groups of the 1990s: political, governmental, interest groups and individuals. The study’s main empirical focus is on their arguments and the rhetorical images they present (as it appears in policy documents) and it approaches the policy history of IT during the early to mid-1990s, which was a period of increased IT ‘hype’ that began with a speech by Carl Bildt in 1994 at an IVA meeting. Among the many public investigations and discussions that were initiated at that time was e.g. a governmental delegation by the Ministry of Industry and also several studies and reports commissioned by the first and second IT Commission. A ‘Top Manager Forum’ was established and the period ends with the implementation of a National IT Bill in 1996, in which the state defined the roles and strategies for implementation of a new IT infrastructure. Johansson argue that Sweden thereby basically copied the IT policy of the Clinton Administration in the United States and that of the so-called Bangeman Report. The outcome of the policy and bill is not studied.

Klang (2006) Disruptive Technology. Effects of Technology Regulation on Democracy studies a type of political discussion that arise when the effects of diffusion of IT become manifest. This dissertation is based on perspectives from informatics and is focused on several Internet phenomena related to democratic value, especially, governmental regulation of the Internet. IT was successfully diffused in the form of the Internet, however use and users turned out to be ‘unregulated’ from a state perspective. Klang study the following phenomena: civil disobedience activities, regulatory definitions of computer viruses, the increasing lack of
integrity through spyware, ownership issues with respect to artefacts created in multiplayer online games, economic vs. politically motivated software production, and online censorship by authorities. However, the study do not focus specifically on Sweden or Swedish users.

The above contributions are examples of the large body of literature that have analysed and commented on IT as policy and political processes. The studies are primarily based on an analysis of public records, even though most analysts also add other data to their study. In sum, the Swedish policy and political discussion on IT is well researched. However, ‘IT’ is seldom described in any length or detail.

**IT and work**

This section describes a stream of research, focused on IT and work but that is separate from the large tradition of computer supported cooperative work (CSCW), which is described later.

Sturesson’s (2000) dissertation, entitled *Distansarbete: Teknik, retorik och praktik*, compares the vision and rhetoric underlying the implementation of ‘telework’ with the actual outcome of these implementations between the 1980s and the mid-1990s. Two Swedish municipal contexts are used as case studies. Sturesson showed that expectations of the role of ICT for work were highly exaggerated. The dissertation’s theoretical perspective is loosely coupled to discourse theory and social and technical change. This study of IT rhetoric uses various types of material, such as reports, mass media documents and promotional material from ICT implementation projects. This empirical data is contrasted with investigations of actual ICT use in telework context using survey methodology. The study showed that ICT was assumed to open up radically new forms of organising work. ICT was expected to de-couple work from geographical constraints; however, to the extent that it had an impact at all, the new technology was integrated with existing work practices. Sturesson summarised these as three discrepancies that were evident at the time of the study. Firstly, telework had not become as popular as expected. Secondly, while computer ownership increased rapidly, computer-based communication did not and people who worked from home tended to use traditional tools rather than computers. Finally, the decoupling of worker and workplace was limited to the self-employed, professionals and clerical employees.

In a survey study entitled *Genus och teknik i försäkringsbranschen: Om mäns och kvinnors upplevelser av datoriserat arbete*, Westerström (1997) analysed the impact of computerisation in the Swedish insurance industry from a gender perspective. One finding was that although women were starting to make inroads in computers specialist jobs, the major gender structure in the insurance industry was still a traditional divide between high-status work (men) and low-status work (women). A somewhat surprising finding, from a work science perspective, was that women saw greater benefit from the new technology than men, despite the fact they did not control its implementation. A probable explanation is that ICT affects work status. Computer-aided design (CAD) and computer-aided engineering (CAE) were introduced at different rates in the various engineering work areas in the early 1990s. The study by Sundin (1995) entitled *Teknik och organisation i teori och praktik: En CAD-introduktion i kommunal förvaltning med beaktande av genusdimensioner* described this transformation in one organisational context. That study traced how low-status work of ‘making drawings’ (maps)
in land surveying office – a task usually performed by women – gained status when CAD systems were implemented. Also the study by Dahlin (2008), *Trö hopp och IT. Stora och små berättelser från ett förändringsprojekt* point at the role of users’ active construction of the meaning of IT during implementation in work contexts.

The dissertation by Wikstrand (2011), *The technical game. Negotiation of work, technology and gender in the relation to the introduction of new information systems*, is based on a work science and sociology perspective. Wikstrand studied how class, gender and organisational context affect the way in which the implementation of information system technology is received and interpreted by different occupational groups. The dissertation used work-place life-story interviews at two different organisational contexts: a hospital and an electric utility company. While the implementation of a new ICT technology is the starting point for negotiations concerning work content and division of labour, technology is regarded as being open to different interpretations. Wikstrand argued that the differences between various occupational groups explain the differences in how technology is perceived and received.

*Informationssamhällets geografi – IT, arbetsplatserna och rummet*, by Hedlun (2003), is a survey based on the knowledge interest of the Swedish Road Administration, which wanted to know how IT affects travel habits. The study was based on 2200 workplace survey questionnaires sent out to different organisations in the late 1990s. The study revealed significant differences in ICT use between industry sectors, regions and municipalities. In line with other studies, increasing IT use did not reduce travel in any simple or direct way.

The theme of workplace communication was studied by Heide (2002) in *Intranät – en ny arena för kommunikation och lärande*. Based on social constructivist media studies in the area of computer-aided planned communication, this study conducted 25 interviews at Ericsson Mobile Communications, which represent one of the better equipped and culturally prepared organisations in Sweden for computerised communication and learning. However, professionals who used the company intranet for other purposes, such as finding out business information and firm news or to disseminate information, did not adopt the intranet for communication purposes for their primary work tasks. The intranet did not solve a communication problem that could not be handled in other ways. Communication was not moved onto the platform; for example, no new form of potential cross-department communications and learning arose. Face-to-face communication remained the most important way of communication and learning. E-mail was seen as more important than the intranet for communication.

A common theme of this comparably large body of literature is that social changes from ICT implementation do not occur in the way that implementers expect. A study of the historical appropriation of IT in work context is desirable, however, also methodologically challenging since many of these organisations do not leave behind historical traces in the form of documents.

**IT and learning & IT and Children**

This research path is focused on the use of IT in educational contexts. The IT Commission and the Knowledge Foundation (KK-Stiftelsen) have both prioritised IT in education for long periods and have funded a wide range of studies. The studies below is only a selection.
The philosophical note by Rask (2000) entitled Med eller utan filter? Personliga funderingar kring etiken, pedagogiken, källkritiken och vuxenrollen när internet kommer till skolan is an enlightening introduction to many of the complex challenges and opportunities that the education system faces during the integration and use of Internet as source and medium for learning in the school environment. Rask outlined many of the questions that now appear in studies or research programmes in this area. Internet use in schools raises questions that many people regarded as new, such as “how do we know what is true and what is not?”. Rask’s major contribution is to show how almost all ‘IT issues’ are not really new but are fundamental issues that have to do with ‘learning’ and ‘knowing’ more generally.

There are several empirical studies that focus Internet use as both conservative phenomenon and as novelty. For example, in a dissertation entitled Bridging the Distance – Children’s Strategies on the Internet, Dunkels (2007) studied the rise of new ‘net culture’ phenomenon among young people. The major findings are also reported in a popular science publication in Swedish, Vad gör unga på nätet? (Dunkels 2009). ‘Net culture’ is understood as referring to the broad phenomena of using different interaction applications on Internet environment, which lead to the development of new practice, rules and norms. The dissertation focuses on how children perceive and handle threats and negative phenomena when they are online. The study is based on interviews with school children at the age of 12, with the Internet also used as media and context for the research interviews. In contrast to ideas about the positive feedback between Internet and globalisation, this studied group used Internet for conventional purposes that can be regarded as local, such as finding information about their immediate geographical surroundings at the school or communicating with friends. Another finding relates more to the specific new culture that develops on the ‘net’. This pertains to the various new strategies young people develop in an Internet environment in order to mitigate various risks. In particular, Dunkels pointed out the type of risks that are the result of a general absence of adults in these contexts. Dunkels argued that young users expose themselves in ways that differs from other social interaction, but they also develop novel strategies that help them navigate in the new environment. A dissertation in the field of pedagogy by Hernwall (2001), entitled Barns digitala rum: berättelser om e-post, chatt & Internet, studied how a group of 8–13-year-old school children used and experienced IT technology in the school environment during the start of the Internet era in the late 1990s. The perspective was described as pedagogical ethnography; however, rather than having a participatory orientation, the data was actively generated by the analyst through discussions or via e-mail correspondence in the school context.

The argument that ICT may not be so transforming after all was also a theme of Thulin’s (2004) study, The virtual mobility of young people – the use of computers, the Internet, and mobile phones from a geographical perspective. Thulin make used of the statistical data on communication patterns that is generated by the large annual national communication survey called ‘KOM’ (statistics by SIKA and SCB), combined with in-depth studies of use patterns among young people. The latter was based on interviews with approximately 40 high school students in 2000 and 2002. Interviews were based on information from structured ‘use diaries’ of the every-day use of ICT among these students. One of Thulin’s main arguments is that the use of ICT is a thoroughly complementary phenomenon to existing patterns of communication and spatial movement among young people. Rather than being a general social and societal transforming force that leads to substantial changes in behaviour on an individual and collective level, ICT becomes part of and has an effect on specific contexts. Thulin identified
four categories of such use: school and studies, leisure and entertainment, social (interpersonal) communication, and what was then still limited use of e-services such as shopping or banking. One example of this complementary role is that, rather than leading to new contacts, the Internet was used to maintain contact with people the respondents already knew. For cases where the contact is with a person located far away, personal contact preceeded the use of the Internet and ICT. The expectation that ICT transforms society and social life was found exaggerated. ICT was embedded in a context of use and had a different meaning and impact in relation to these different activities. There was no general master trend or outcome. As Thulin argued, “No doubt ICT opens up a space of new possibilities, but the actual outcome of these new possibilities in a social and historic context, is not given”. In a nod to the famous geographer, Torsten Hägerstrand, Thulin stressed that one must distinguish carefully between ICT as a ‘space of possibility’ and ICT as an empirical (and historic) outcome.

In my view, Thulin’s argument is to-the-point and a well formulated critique of earlier IT studies in Sweden. The focus on the possibility space of ICT, for work, democracy, etc., is problematic without a firm understanding of both the general and specific relationship between such spaces of possibility and actual socio-technical outcome of implementation. One area in which the discrepancy has become particularly obvious is telework. For example, the potential for using ICT to reduce energy use and environmental impact is seen as being great – it underlies several policies in that area – yet actual use remains miniscule. This seems not to discourage new implementations. Furthermore, it is not evident if IT use will reduce, increase or remain neutral with respect to actual travelling patterns.

This section ends with a classic piece in the area of IT and young people: Nissen’s (1993) Pojkarna vid datorn. Unga entusiaster i datateknikens värld. This is a comprehensive study of a today well-known sub-culture phenomenon of IT use. The aim of the study is to describe and analyse the culture of a use-intensive group defined as Swedish ‘computer-captivated’ young boys (cf. adolescent hackers). The perspective is rooted in anthropology. Method and data is gathered through several complementary studies of conversations on the Bulletin Board Systems (BBS) open ‘meetings’ function, text analysis of articles in computer magazines, questionnaires to a larger number of upper secondary school students, and interviews with 15 severely computer-captivated middle-class youths. The term ‘user’ is somewhat misplaced because, more than the studied group uses the technology, they actively shape it. Nissen constructed three aggregated ideal-types of such user – ‘pro’, ‘visitor’, and ‘citizen’ (cf. inhabitant) – representing a varying degree of economic interests, professionalization and status in this particular social ‘world’ that they construct. Nissen used the term ‘counterculture’ to point to the fact that the middle-class context from which most of the studied computer-captivated youths originate is being adjusted to better fit the conditions of a new technology. The expert knowledge and the social network they built functioned as a vehicle for becoming an adult in a new and more ICT-intensive society. As a concluding remark, Nissen noted that being computer-captivated did not mean that informants were somehow different or less social.
Studies of IT use and design

Preamble to the participatory design tradition

In the Swedish context, computer-supported cooperative work has links to what has become known as the ‘Scandinavian School’ of IT design and system development. One early impetus was the DEMOS project (Democratic Planning and Control in Working Life, 1975–1979). In Carlsson et al. (1978), Planning and control from the perspective of labour: a short presentation of the DEMOS project, Pelle Ehn and collaborators describe the early link in Sweden between IT, work, and user-oriented design. This ‘action-research’ was based on the theory of socio-technical systems and critical analysis. Research was conducted with close links to the interests of trade unions and focused on the change in work life caused by the introduction of computer-based systems, in planning and numerically controlled machines. The primary example was the computerisation of the production of newspapers. A subsequent project, the UTOPIA project – 'Utbildning, Teknik och Produkt i Arbetskvalitetsperspektiv' (1981–1986), continued this research path and formulated a participatory and value-driven research agenda. Later, Lundin (2005b) pointed out that not only did this lead to the Scandinavian School of System Development, it can also be seen as an early attempt to build a specific Swedish (and Nordic) user-oriented ‘innovation system’ for national computerisation and IT implementation based on collaboration and interaction between industry, research institutes, trade unions and academia.

Contextual and co-production-oriented studies

The design-oriented research tradition and the emphasis on contextualisation that developed (see Dahlbom and Mathiassen 1993) became an important part of the field of informatics in Sweden; that is, a field that takes “the intertwined complex of people and information technology as its subject matter” (Dahlbom 1996: 29; 1999). The ‘socio-technical’ and constructive perspective was, in a manner of speaking, inscribed in the very formulation of this research agenda. The development of this research path includes the rise of departments for computer science, informatics and several new research institutes. In terms of research perspective, both actor-network analysis (a modern formulation of ‘socio-technical’ analysis) and ethnographic-inspired methods have become trademarks of this research tradition.

Another trademark is the strong focus on publication in international journals. The ‘basket of six’ has been mentioned as important publication targets for informatics research. These six journals, in alphabetical order, are: European Journal of Information Systems, Information Systems Journal, Information Systems Research, Journal of AIS, Journal of MIS, and MIS Quarterly. Two more journals that will soon join the top basket of journals are Journal of Strategic Information Systems and Journal of Information Technology. A top-100 ranking of recent

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17 Interactive design has become a major ideal for the development of new products and it emphasises users and usefulness. See also Ehn (1988, 1989) and Ehn and Löwgren (1997).

18 Börje Langefors, who is also seen as an ancestor of informatics in Sweden, provided the important notion of information systems as ‘socio-technical’ rather than technical (Langefors 1966; 1995).

publications in these eight journals mentioned three Swedish researchers (ranked 29th, 36th and 54th) and two academic milieus are mentioned (ranked 62nd and 82nd). Apart from these top journals, a large number of journals also report this type of research. In addition, and to a larger extent than in many other social science fields, conference proceedings count almost as ‘journal’ publications.

One important stream of this research is computer-supported cooperative work (CSCW), which distinguishes itself from mere human machine interface studies (HMI) by its focus on collaborative contexts rather than individuals, and on social aspects rather than on mere interfaces. One example is Lundin (2005a), *Talking about work. Designing information technology for learning in interaction*. Lundin studied the learning dimension of CSCW, a sub-field known as computer-supported collaborative learning activities (CSCL). This sub-field has been an important focus in studies of educational contexts to the use and design of ICT. The basic assumption is that modern work situations can be described as increasingly mobile and distributed, and that the possibility of traditional ‘hands on’ learning has become limited in this work setting. Therefore, new ICT devices and platforms are potentially interesting, not only for performing practical work tasks but also for achieving organisational learning. This analysis of use is explicitly design-oriented; analysis is important but its primary goal is to provide information for a subsequent design process. The methodology varies between the papers in this dissertation. However, to give a view of the method, one paper relies on semistructured interviews with a limited number of people at managerial levels in the IT department of one firm. This is complemented with non-participatory observations, ‘shadowing’, of an individual during a day at work where the analyst takes field notes. One of the study’s main results is that learning is embedded in everyday communication and ‘mundane talk’ situations. This leads to the view that a learning supporting technology must acknowledge this fact. The study approach learning as professional phenomena that has no national or industrial sector context and that rely on a ‘culture’ that transcends (even neglects) other social and historic categories.

Another example is the study of computer-supported cooperative work by Wiberg (2001), entitled *In between Mobile Meetings: Exploring seamless ongoing interaction support for mobile CSCW*. Wiberg examined the use of communication technology within a technical service organisation of a large telephone company, the work task of which was to visit telephone users and maintain parts of the infrastructure. These technicians move around and use communication technology to coordinate and carry out their work task. Their service vehicles are central nodes in this work since only the vehicle is online and technicians can communicate with central systems through equipment in the vehicles. However, most work is off-vehicle, where technicians use ordinary text messages (SMS). Wiberg’s study is design-oriented, although the first part of the dissertation also describes a work context of the late 1990s. The data collection methodology is described as ‘ethnographic technique’. Essentially, this was accomplished through participatory observation and qualitative interviewing of a small number of service technicians. The study revealed that CSCW, via the tool that the technology provides for coordinated action, allows the organisation to more rapidly change mission, mobilise resources and solve new problems. However, the study refuted the

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20 http://www.vvenkatesh.com/ISranking/RankingsAIS8byUni.asp?RYear=5. The researchers are Per Ågerfelt, Robert Boström, Ola Henfridsson. Academic milieus are the Department of Informatics and Media in Uppsala and the Viktoria Institute in Gothenburg.
argument that the new technology decouples earlier spatial and temporal work constraints. The study points to the role of a geographic ‘home-base’, where the service organisation can meet and have discussions. This home base remains important even though the organisation use mobile ICT. Only a very small portion of the work of this service organisation could be done “everywhere and at any time”, which is the underlying vision and expectation of CSCW design.

Nyberg’s (2008) dissertation, entitled Att studera digitala artefakter i människors vardagsliv, examines the domestication of digital artefacts among users aged 20–60 with respect to how they relate to and engage with digital artefacts. Domestication research emphasises the active component in the appropriation of a new technology. Domestication research emphasises the construction of the meaning of technology and, by extension, claims to be one way in which ‘use’ feeds back into the development of a new technology. Based on user diaries and interviews, the study investigates domestication using a small number of users in private situations. The study also includes empirical data from the use of computers and mobile telephones within a group of five academic researchers. Based on interviews, this part focused on how the researchers used these artefacts when constructing the boundary between private and professional context (private use in professional context and professional use in private context). However, the study provides very little empirical description and conclusion about ‘use’ and ‘users’.

The dissertation by Hult (2003) entitled Publika informationstjänster. En studie av den Internetbaserade encyklopedins bruksegenskaper is a user-centred description of domestic ICT artefacts. The Internet-based Swedish National Encyclopedia (NE) is used as a case. The study relies on documents and interviews and combines data from producer and user contexts. There are two major reasons for the focus on users. Firstly, the dissertation argues that there is a lack of analytical and design-oriented concepts for description and analysis of everyday use of Internet-based information services (cf. the quest for a theory of the artefact in Dahlbom 1993). The study approaches this problem as a lack of ‘genre knowledge’. Without a language with which to describe ‘use’, it is very difficult to include user concerns in an early design processes. Without adequate language, actual users will not be able to express and communicate their needs to producers. Secondly, a common practice in IT system product development is to emphasise mainly ‘functional’ aspects and presumed objective features of user interface. This information system perspective works for a specific organisation where use is comparably stable or predictable. In other less stable situations use is more complex phenomenon, meaning that the actual user practice, behaviour and experiences are often neglected. There is in sum a lack of genre knowledge and language that can facilitate feedback and there is a lack of understanding of use as an emergent and changing phenomenon, Hult argues.

Another type of research and research community is Internet studies. The stated research themes of the influential Oxford Internet Institute may be used to indicate important formulations and streams of research in studies of the Internet. The themes correspond to five different academic appropriations of ‘context’ and thematic aspects: everyday life, governance and democracy, network economy, science and learning, and shaping the Internet. Internet researchers are organised in an Association of Internet Researchers (AoIR), which organises academics from cultural studies, social science and informatics who share an interest in social and cultural phenomena related to the use of the Internet. The
AoIR, which in 2010 held its 11th international conference in Gothenburg, focuses on various aspects of Internet sociality, with a particular interest in tracing new phenomena that arise on the Internet platform, such as games and new social media applications. Swedish contributions at this conference discussed, among other things, the Internet and children, gaming, gender and virtual worlds. Some of the papers from the annual conference are published in a special issue of the academic journal Information, Communication & Society (see e.g. Axelsson 2010). Hektor (2001) also studied the Internet, in What's the use? Internet and Information Behaviour in Everyday Life. The aim of that dissertation was to develop a model for analysis of individual and micro-social ‘information behaviour’ in everyday life situations. A limited number of users (10) were studied using diaries and interviews. All users were white collar workers with comparably high education level and all could be regarded as IT experts. Due to the focus on theory, this study actually reveals very little about everyday life or Internet use in a Swedish context. The opposite is true of Bergström’s (2002) Är svensken mätt på internet? which comes from the field of media studies rather than Internet studies. The media studies community in Sweden has been monitoring the use of ICT and Internet because it is regarded to be part of changing media behaviour (please note that this type of research could have comprised a separate section in this overview rather than mention of only one publication). Bergström analysed the use of Internet in the late 1990s. The share of Swedes who used the Internet more than once a week rose from less than 10 percent of the population in 1995 to about 80 percent in 2001. High-volume users are young people aged 15 to 19 and middle-aged white collar workers. Retired blue collar workers were still largely offline in late 1990s. Factors that influenced use were age (which, in line with other studies, was argued to have the strongest influence), followed by social class; gender was not found to be an important factor for Internet use. 

The above research is a clear attempt to integrate social and technical descriptions, and in this sense, to be contextual. However, the fact that the knowledge interest is in design does not promote a sufficiently wide contextual analysis. The social context ends up being non-social and ahistoric when measured against other social science fields or historic research: “the focus has shifted from the use of computer technology in administration to all kinds of use situations. However, along with this transformation seems to be a change in interest, from the practical use and design of computers to a much more abstract and theoretical interest. In a sense, we have left practice and entered a more abstract level” (Ljungberg 1999: 84). This shift created a dilemma for the present overview. A significant number of Swedish researchers that focus on use and users do not explicate that their studies relate to a Swedish context. Studies are usually not historical and are not about Sweden or about a Swedish user. The investigated phenomena are instead based on a description of some kind of ‘generalised’ user or use, which is often decoupled from contextual description familiar to other fields of social studies and historical studies. This is partly a result of a methodological paradigm that borrows from ethno-methodology (cf. Miller and Slater 2000; Turkle 1984). Studies are dedicated to researching the ongoing use or the arising use phenomena that has not yet diffused to broad groups. This research and its publication patterns has also comparably strong communality behaviour. It is my impression that the research frontline changes topic faster here than in many other social science fields.
Studies of implementation

The third research theme that this overview has identified is studies of development, implementation and diffusion (cf. innovation). For obvious reasons, American history of science, technology and economy are important reference. Central aspects are technical artefacts and systems and a producer-oriented focus in the description and analysis. This type of study has not been particularly strong in the Swedish context. One reason, of course, is that the US is home to a large part of technology development that relates to computers and information technology. The phenomenon of US materials research, research policy and industrial development, especially during the Cold War era, has generated many interesting historical studies of the development of technology and computer systems (see e.g. Forrester 1980; Leslie 1993; Edwards 1997; Lécuyer 2006; Akera 2008). It includes studies of the precursors to what became known as the Internet (Abbate 1999), and studies of the remarkably strong regional economic development in California that was linked to the rise of an industry for computer technology development (Saxenian 1994). This literature also includes studies of the rise of new civil markets; for example, through the development of IBM (Cortada 1993). A comparable focus on Swedish producers of IT systems could be developed as a new research focus.

The role of IT for the US society and economy is a development that many countries have envied and tried to replicate through planned development (not least of these is Sweden) in the form of large R&D policy programmes for computers and IT development (cf. Glimell 1988). This is also one reason why the Swedish system has had a comparably large portfolio of IT research. Apart from a few notable exemptions (e.g., Lundin et al. 2010), this type of research that integrates historical, technical and political description is rare in the Swedish context. However, the recent anthology, Warfare and Welfare (Lundin et al. 2010), includes a chapter about the earlier phase of ICT implementation in Sweden.

The producer perspective on implementation is forwarded also by Lindmark et al. (2004) in a history of telecom in Sweden, in Telecom Dynamics: History and State of the Swedish Telecom Sector and its Innovation System, 1970–2003. This 450-page descriptive report is mainly based on secondary data and on the innovation system approach (IS), particularly the ‘technological’ innovation system approach (the ‘TIS model’). This is a unique work, mainly because of the sheer volume of empirical data that it presents. Another example is Computerizing the Swedish Welfare State: The Middle Way of Technological Success and Failure, by historian of technology Kaiserfeld (1996). Kaiserfeld described the attempted development of a Swedish school computer, the so-called Compis Project. The project was industrially successful in the sense that the Swedish computer industry acquired new competence, particularly in software development, but a failure from the perspective of the projected users, students and teachers. This story of Compis was described also from an educational perspective in Riis (2000a) Skolans datatorisering under 1980- och 90-talen. Johansson (1993) describe in Informationssamhällets rötter ur ett svenskt perspektiv, an implementation process where, during the 1960s, the development of IT was driven by administrative and organisational goals. The expansion of public administration, particularly the social security system, made Sweden an early adopter of computer technology under a central government paradigm. Hallberg’s (2007) IT Gryning. Svensk databistoria från 1840-till 1960-talet provides instead a technical insider’s account of early computer technology development and its industrial pioneers in Sweden. The investigated period is about IT in its early stages of development and the
presentation is somewhat anecdotal. Nonetheless, it does provide interesting details and entries that can serve as an important starting point for historical analysis. Especially with respect to the link between Swedish ICT development and national interest and military development projects such as those described in the case of Datasaab. A more recent example is the insider account of the rise of the Swedish Internet by Hamngren and Odhoff (2003), entitled De byggde Internet i Sverige. While this study also focuses on pioneers and tends to lean towards anecdotal evidence, it too provides an entry for future historical work on the rise of the Swedish Internet.

Other studies of implementation focus more on the user side of implementation processes, or on how users become a major component in the implementation process. In Datorer åt många – en studie om datorn som vardagsteknik och kunskapsverktyg, Pettersson (2001) studied the Swedish Employee Purchase scheme of personal computers for private use (Personaladatorerbjudandet), which is considered a major reason for the rapid and, in an international comparison, early diffusion of PCs among Swedish households. The analytical perspective builds on Rogers’ model of diffusion of innovation and the notion of ‘early’ and ‘late’ adopters (cf. Rogers 1995). Pettersson analysed the political history of the PC employee purchase scheme for households using public documents, 14 employee purchase schemes from different organisations, and a user survey of 1500 people. The use of computers was found to be a socially stratified activity. Whereas academics and people in administrative occupations used computers at work and had also started to use computers at home, blue-collar unions realised that their members lagged behind in both areas. A three-party collaboration between the state, employers and unions was launched to introduce PCs in Swedish households. It was arranged in 1998 as a ‘loan’ of PCs to employees for educational purposes, by which a special tax regulation could be used that exempted PCs from ordinary taxes. The employers formally owned the PCs and rented them to employees. The employee retrieved a state-of-the-art PC that could be used at home whereby the employer reduced the salary with a sum representing a ‘rent’ for the computer before tax. The effect was the rapid diffusion of PCs in Sweden in domestic context between 1997 and 1998 (by reducing this group of late adopters). In addition unions offered ‘membership PCs’, and in one major workers union this PC was named ‘the union computer’ (LO-datorn). The unions negotiated competitive prices with suppliers, and a larger number of computers were purchased also in that way. Approximately 30 percent of employees in Sweden may have used this tax programme. The cost for the state in reduced tax income made this state intervention a fairly costly but still effective way of increasing the diffusion of PCs in Sweden. A more modern example of implementation is local Internet implementation, as analysed by Elmroth (2004) in Uppkoppling pågår. IT-föreningar bygger områdesnät. Elmroth’s research, which was part of the LearnIT research school project by KK-Stiftelsen, studied private IT network implementation by groups of households that organise implementation through the creation of a local IT community (IT-föreningar). Three such organisations were studied. The method is based on observation of meetings of the groups, interviews with participants and analysis of e-mail communication. The basic perspective is analysis of the domestication of technology. The study concludes that the technology perspective of the state influenced the local domestication process of broadband Internet technology. However the implementation was still user-driven and largely privately financed. Entrepreneurial individuals or smaller groups worked to convince actors that IT was a necessary and desirable development.
The tendency in above studies is that they study implementation mainly from a producer or a user perspective; a combined approach is still rare. The integrated study of ‘production of IT’ and ‘IT use’ remains.

Finally, there is a sub-set of implementation studies that concerns the future, rather than analysing present or past developments. Futurologists use a class of concepts that describe a future society and social life in which sensors, computational power and communication technology become so widespread and omnipresent that they impact individuals, social life, society, artefacts and technical systems. This type of discussion emerged with the rapid diffusion of the Internet in the 1990s and it spurred engagement in scenarios about ‘ubiquitous computing’, ‘u-ICT’, ‘ubiquitous society’, ‘u-Society’ and ‘Internet of things’ (cf. Greenfield 2006). A discussion of Swedish development towards u-IT and u-Society is that of Gossas and Lundqvist (2009). The notion of ‘Internet of things’ and of ‘embedded systems’ also have a more contemporary, practical and mundane aspect that has not yet been visible in the literature. Microcomputers are abundant in a range of mundane artefacts, such as toys, coffee machines and automobiles. These often include sensors and some level of computational capacity but do not generally communicate with one another (machine-to-machine). Nor are artefacts linked to an information infrastructure (Internet of things). There is however areas in which this occurs in limited ways. For example, vehicle IT, vehicle telematics and intelligent vehicle systems are attempts to enhance interaction between vehicle and driver, ‘awareness’ and interaction between vehicles, interaction between vehicle and roadside, and between vehicle and societal infrastructure. The logistic sector has already started to develop asset tracking. In the steel and paper industry, there are ongoing developments of ICT for product identification and toll documents that enable more efficient handling of goods. This means that it should also be possible to conduct historical studies within the perspective of ubiquitous computing. Instead of focusing on the future and the increasing number of ever more ‘net-like’ linkages, an interesting and researchable subject is a more thorough description and analysis of how we already live in an ‘ubiquitous-like’ environment and how this situation has emerged historically.

**Tentative results and discussion**

In terms of publication patterns it was found that ‘IT use and design’ publishes in international scientific journals whereas the ‘IT use and Swedish society’ tradition do not publish in English to the same extent or in the form of journal articles. This affects the relative presence of Swedish research fields and Swedish contributions in international journals. In particular, it affects what can be said about Swedish user-oriented IT studies by quantitative, bibliometric, methods. The study of bibliometric data showed that available databases are not representative of Swedish research on IT use. A larger study by Jarneving (2011) also confirms that bibliometric analysis of a large and multidisciplinary field such as ‘IT’ is a problematic task. Therefore, the primary findings in this overview are derived from textual analysis of literature on IT use.

This literature separates into two majors streams of work, plus a smaller third stream that has the potential to develop an integrating role of drawing together the first two and to become a new and interesting contextual historical research tradition on IT implementation and use in Sweden.
The first body of literature, represented by research on *IT use and Swedish society*, formulates research questions in response to a political discussion or a policy intervention that initiates or frames the investigation. A large portion of social studies of IT use is published as reports in Swedish and are intimately linked to a contemporary policy process. In many cases, the reports are produced by academic researchers and are of high quality. However, reports and public records such as those published in the Swedish public SOU system are not part of peer review research literature and are not regarded in this overview as part of a research literature. Another sub-stream of literature that is not included here is an ideological stream of literature on IT in which researchers tend to perform the role of policy and politicians. It represents interesting views of people who really are experts on IT and society; however, ‘as text’, these publications cannot be considered research publications. This is partly why the studied literature in this section is based mainly on dissertations and not books in general. This has resulted in analysis of a number of studies that develop a critique of IT as democratic technology or self-propelled unproblematic technology development. A major finding is that ICT ‘itself’ is distant and rarely an integral part of description and analysis. Studies may provide highly interesting analysis and reflections, but they usually provide little or no data on the actual IT developments upon which they comment. IT is represented by the acronym only, or by general assumptions and views of what the acronym means.

Borrowing a term from the history of technology, it can be argued that much of the analysis in earlier research leans towards an externalist account of technology. A tentative result is that there is a lack of contextual social history of Swedish ICT that integrates descriptions of technology development, diffusion and use.

The second body of literature, on *IT use and design*, is very different from the first type of literature. It is important to understand that IT research about Swedish implementation and use is only part of the IT research conducted in Sweden. The divide between ‘about Sweden’ and ‘conducted in Sweden’ had implications for the mapping and analysis of research in this report. It also motivated the separation into two sections – one on IT use in the Swedish society, and the other on IT use contexts aimed to inform design of technology. If the present research overview had been delimited to research about a Swedish development, a large portion (probably even a majority) of the people in Sweden that identify as ‘IT researchers’ would end up being outside this overview. The two major sections also represent different academic field, methodology, and publication behaviour. Research about Swedish developments typically takes the form of a monograph; for example, in political science, sociology or history. Research publications in design research on the other hand (for example, in informatics) are part of research that is conducted in Sweden but that is usually not about a particular development in a Swedish context. The topic and aim are formulated in the context of international conceptual debate and theory development. To frame the problem in another way, it would be difficult to write a Swedish history of IT using the contributions from design-oriented studies. On the other hand, these researchers probably have experience and access to Swedish data, even though this may not be immediately obvious from a particular published article, and this research community may also be interested in participating in more historically oriented research. On the positive side, this research is highly relevant in the sense that it studies co-production of social and technical domains. Research on IT use and design is explicitly contextual; however, it is presently contextual only in a narrow and specific sense. Firstly, its ‘social context’ is different from what social context means in many other fields of social and historical studies. For example, when a profession is studied from the perspective of CSCW and informatics, there is
typically no reference to areas such as sociology of profession, work science or anthropological studies of workplace culture studies. Aspects such as education, local community norms, age, gender, social status, hierarchies (or Nordic culture of non-hierarchy), workplace regulations, organisational culture, and so on, are absent in the context that is described. This is also why these studies do not explicate that they relate to a Swedish development, since most of that context is outside the knowledge interest to aid the design of IT artefacts. Social context somehow ends up being peculiarly non-social. The other aspect is that there is no history; only a present (the analysis part) and a future (the design claim). This would have been less problematic had the empirical descriptions of dissertations and articles in IT use and design not been de-contextualised as a ‘Swedish’ empirical data set. A third and final aspect is that this research focuses on theory development, and contextual empirical description is made for the design purpose of the study. A tentative result, therefore, is that the ability and interest to integrate social and technical data is highly interesting, but it needs to be translated into a broader context and a more historical approach in order to fit the agenda of co-production research.

The third body of research described is research into IT implementation in Sweden. This comparably small body of research describe implementation from either a producer or a user perspective. Virtually no of these studies of implementation integrate user/producer developments in their descriptions and analysis. Several of the contributions that develops a producer perspective on IT implementation are written by researchers from engineering disciplines, rather than by historians or social scientists. These contributions do not rely on research methodology and tend to build arguments based on anecdotal evidence. Importantly, however, these contributions should not be overlooked when it comes to the design of historical research projects. The descriptions are rich and there are probably many interesting suggestions to be found regarding what entrepreneurs and technologies that historians need to study more thoroughly. While there are some studies of user aspects of implementation, this remains an underdeveloped field. The combined description on producer and user development and of implementation and use is almost non-existent. A primary goal of a historically informed study of Swedish IT should be to fill this gap.
Steering group meeting, 2011-02-24

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Nina Worbs, KTH
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Workshop, 2011-03-22

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1962:32 Databehandlingskommittén.
1984:20 Dataeffektutredningen.
1994:118 Vingar åt människans förmåga.
1999:85 Bredband för tillväxt i hela landet.

Prop. etc
2004/05:80 Forskning för ett bättre liv.

Statistics on ICT use

SCB (from 2000) IT in enterprises. Annual statistical investigation of the use of IT in private firms. Started in the year of 2000 and is reported in separate publications. Statistical data and publications are downloadable at http://www.scb.se/Pages/Product____15308.aspx.
Bygger ett kompetentare Sverige
www.dfs.se