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Cover Page Footnote

This paper is co-authored by Niels Bjørn-Andersen and Torkil Clemmensen. The listing of authors is in alphabetic order with equal contribution of the two authors.

The Shaping of the Scandinavian Socio-Technical IS Research Tradition

Confessions of an accomplice

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Abstract. This paper relates stories instrumental in shaping the career of an individual and which have also contributed to shaping of the IS field in general and the ‘Scandinavian Socio-Technical (S/T) Information Systems Research Tradition’ in particular. The method in this paper is an autoethnography (Lanamäki 2015) of Niels Bjørn-Andersen from Copenhagen Business School (CBS), an S/T researcher who started his career in Information Systems at CBS on 1 September 1969, at a time when the IS field for all practical purposes did not exist. It is written as a dialogue that includes both the confessional voice of the autoethnographer and the questioning voice of a younger researcher, the second author, who wants to bridge S/T into the future. The main contributions of this paper are to provide: 1) insights into career development in IS in general and in one of the Scandinavian IS pioneers in particular; 2) a historic account of some of the key events in the early days of S/T IS in Scandinavia; 3) an account of the experiences and the challenges in creating a new research field such as IS; and 4) a summary of Niels’s key learnings hopefully relevant to young and mid-career IS researchers.

Key words: Scandinavian IS research, socio-technical tradition, academic career, autoethnography, historical method.

1 Introduction

We are at a time in history when the IS field has become mature, when the field’s pioneering researchers have retired, and when an historic perspective can preserve stories in order to bridge to the future. Looking back on the development of the information systems (IS) research field in

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Scandinavia, the Socio-technical (S/T) tradition has been successful (Avison et al. 2006a; Avison et al. 2006b; Bjørn-Andersen and Raymond 2014; Mumford 2006). Today S/T is undergoing a renaissance. It is being adopted, reformed and further developed by newer generations of researchers, who are often ignorant of the contributions of those who came before them (Van Maanen 2015). Our paper will provide and preserve knowledge about the past contributions to S/T in a format that bridges to the future of ST. Our paper provides the story of how Professor Niels Bjørn-Andersen from Copenhagen Business School (CBS) has been highly influential in establishing IS in Scandinavia and Europe since the late 60s, and specifically how he has contributed to shaping the ‘Scandinavian Socio-Technical Information Systems Research Tradition.’

The key characteristic of almost all Scandinavian IS research is that it challenges a purely technical perspective. While the starting point is typically some (new) information technology, Scandinavian IS research does not focus on technology per se, but on social issues on four different levels: the interaction level (HCI, UX¹ and Interface), the individual level (job satisfaction, job design and automation), the organizational level (decentralization, decision making, business models and strategy) and/or societal level (unemployment, privacy and wealth distribution). Although the focus of Niels has been on the individual and organizational level, he has contributed to all four levels. It is also characteristic that in all his work over five decades, he has attempted to strive for a careful compromise between the social objectives and the technical opportunities.

Anyone attempting to bridge the Scandinavian IS research into the future, should be aware that the early days of Scandinavian IS research were full of conflicts and tensions among three major research traditions (Bansler 1989): 1) The Systems Theoretical tradition, with its functionalistic view of system development as a technical process, 2) The Marxist inspired Critical tradition that fought for workers’ influence on IT development and a revolution in society and 3) The Socio-Technical tradition that had, and still has, focus on facilitating, balancing, optimizing and innovating relations between the technology, on the one hand, and on the other, the organization and the IT users. Niels’ career came to be closely intertwined with one of these three traditions, the S/T tradition. However, the conflict and collaborations with researchers from the other traditions were part of the shaping of both his career and the S/T research field in general. Niels was one of the founding fathers of Information Systems in Scandinavia, influencing the creation and formation of the IS field in general and the Scandinavian IS tradition in particular.

At the end of August 2016, Niels Bjørn-Andersen officially retired after 47 years on the payroll of Copenhagen Business School (CBS). During his career, Niels received several academic awards, including the IFIP Silver Core, AIS Fellow, and the AIS Leo Award. He became the first president of AIS in 1996 after the inaugural president, Bill King, and thus was the first elected president. He was knighted by the Queen of Denmark in 2003 for his academic achievements. He served on a large number of committees funding IT/IS research in the EU from the very first ESPRIT programs in 1983, and he has served on many assessment committees of IS education and IS research in the Scandinavian countries influencing the direction of the field of IS. In the late 70s, Niels was for three years a member of the British Social Science Research Council as the only non-British researcher. In 2014, the Danish association of IT professionals awarded him the prize of ‘dedicated enthusiast’—the first academic to receive that award from this practitioner association.

On the educational front, Niels was a major driver in the development of IS educational programs in Denmark, from the first courses in IS in the mid 70s to the founding of the Bachelor

in Business and Computer Science (a full IS program) in 1984 and the M.Sc. in Business and Computer Science in 1987, to the executive Global e-Management program jointly offered by seven business schools in 2000, and to the introduction of MOOCs and blended learning since 2010. To this day, Niels' network of CIO professionals in Denmark is second to none among Danish academics.

We write this paper in order to illustrate how both individual academic career development and community building via rendering academic services have gone hand-in-hand. In general, it takes a lot of effort to build and develop an academic discipline such as IS, since an academic discipline does not thrive and flourish without a number of researchers actively and persistently contributing through seminars, conferences, journals, associations, political influences, etc.

We engage theory and findings not only from S/T research (Mumford and Ward 1968) but also from career studies (Hernández et al. 2010; Learmonth and Humphreys 2012) to discuss and put perspective on the stories being told. Overall, we apply a qualitative, autoethnographical approach to career studies, much like the approach exemplified in a recent paper by Van Maanen looking back at his own career (Van Maanen 2015).

In his paper, Van Maanen (2015) first points to the several stages in a researcher's career, and in his experience. This ranged from: the grad student rookie in his twenties (on the margin of the community), to walking around at conferences being confused and wondering what was going on; to the associate professor 'making it' in his 30-40s—delivering papers, organizing sessions, receiving invitation to parties, and networking seriously; to the 50-60 year old professor in his prime, giving key-notes and presentations at invited sessions, now at the inner circles of the community, and becoming an insider of good standing. Van Maanen adds that eventually researchers in their 70s become one of the 'oldies', attending conferences with fewer and fewer familiar faces, and when even former enemies will become embraced as academic friends.

This very general Life Cycle Model for researchers has an almost frightening resemblance to the experiences of Niels, and we shall refer to this stage cycle through the paper. For example, a key marker of a stage in Niels' career was, when he was invited as the official IFIP TC-8 representative to speak at IFIP's 25th anniversary in 1985. He was the only IS researcher at the event. In his presentation of the S/T paradigm for IT development, Niels criticized the chairperson of TIMS-ORSA² for saying in his presentation: 'take away mathematics and there is no science left.' Niels told him that he wholeheartedly disagreed with that statement. The TIMS-ORSA chairperson continued to approach Niels that day, sincerely wanting to learn what else there could be to science if one took away mathematics.

Second, Van Maanen points out that a significant part of moving through a career is moving in and out of research communities, occupations and organizations. He points out that when 'becoming old', the researcher realizes that the community, which once was considered his/her own is passing by and becoming less familiar. The retiring researcher begins to feel—again—at the margin of the community, moving away from the center to the margin. In the same movement, the researcher realizes that the answers, the certain knowledge obtained through so much hard scientific work, is actually nothing more than the beginning of a research area, something Van Maanen says is not a bug but a common feature of academic research. Here again, we follow Van Maanen's approach and do not attempt to summarize the scientific knowledge and wisdom that Niels has obtained over the many years. However, at the end of the article, we present ten

recommendations for young researchers on how to survive and thrive when making a career in the IS research field.

For example, a story that connects career and community development from the early days in Niels' career relates to when he was invited to be keynote speaker at the HCI conference in York in 1984. He arrived at the conference two days early to prepare his talk through carefully assessing the status of HCI as portrayed in the papers published in the conference proceedings. However, he found them to be a depressive collection of papers, and since his keynote became a harsh critique of research published by the audience, he started his keynote by saying: "I do not know why I was invited, and I am sure that in 30 minutes, you will all wonder why." In his keynote 'Are Human Factors Human?' Niels went on to lecture the HCI audience that the HCI research in the proceedings reminded him of the 1898—1901 research at Bethlehem Steel. This research was the basis for Taylor's work on scientific management, dividing work into tiny bits and reducing the human worker to a performer of a strict sequence of small tasks in a system (Taylor 1911). The talk created a lot of interest, and Niels received no less than 72 business cards in response to his promise to honor requests for his paper about the 'Scandinavian model for IS research,' building (among others) on his own S/T research (Bjørn-Andersen 1988).

Third, Van Maanen (2015) argues that an ethnography can provide a sketch of a career, unfolding with stages that the reader can recognize. He states that his perspective is primarily occupational; i.e.; concerned with his career in the research community, but that he could as well have written the ethnography from an organizational perspective that would focus on all the privileges and resources he had during his long employment at MIT.

In this paper, we follow the general approach laid out by Van Maanen, but we include the context. We report the stages in Niels' career from an autoethnographical perspective, but we find it impossible to disembodify our analysis from the context of his employment at Copenhagen Business School (CBS). This is a business school, which over the time of his employment has developed from a small local, national trade school to becoming an institution generally recognized as one of the best business schools in Europe. CBS has provided Niels with unique opportunities and support not only during his career but also during the development of the S/T research tradition within the IS field. However, in a dialectic relationship, Niels has also contributed to the transformation of the school and the creation of what we believe is the largest IS department in any business school in Europe with its 26 faculty (including eight full professors) and 13 PhD students.

In sum, we attempt to provide two overlapping historical accounts: The first is to provide a (personal) career perspective on challenges, initiatives and efforts involved in what it takes to become a renowned (IS) scholar. The second is to provide an overview of the characteristics of Scandinavian Socio-Technical IS research by offering a number of puzzle pieces that contribute—but we stress—by no means even attempt to offer the full grand picture.

2 Methodology

In this autoethnography of Niels Bjørn-Andersen, we have noted how his career as an S/T researcher at CBS in Information Systems started on 1 September 1969, when the field of IS

had just been founded. We apply the four-tiered research framework for historic analysis in IS proposed by Porra, Hirschheim, and Parks (2014), operating with the four tiers of abstractions (paradigm, approach, methods and techniques).

The first tier of the framework is the paradigm or the meta-theoretical assumption, which can be characterized as a social relativistic paradigm that sees historical IS knowledge as socially constructed. Events are not described in an objective, positivistic or functional sense. Instead, they are described and analyzed through explanations in the realm of the individual (Niels Bjørn-Andersen), his consciousness and his subjectivity. We believe that this is consistent with the idea of an autoethnography, which largely reconstructs a complex set of historical events and attempts to make sense of them.

The second tier in the framework is the approach, which is largely pragmatic and dialectic. It is pragmatic in the sense that even though a lot of historical information can be obtained from written sources; e.g.; through tedious library searches and painstaking analysis of written material in mostly physical archives; we have decided to rely primarily on non-structured, non-formalized anecdotal evidence. However, evidence obtained through this very pragmatic approach has been checked against empirically verifiable information regarding dates of events, individuals with their affiliation, as well as checked against literature typically available only in physical books, conference material and minutes of meetings.

The third tier in the framework is the method or methods used. Here, we have largely applied a dialectic approach, allowing it to influence our presentation format. Accordingly, the paper is written as a dialog that includes the confessional voice of the autoethnographer (Niels) and the researcher (Torkil Clemmensen), an active, international contributor to the development of S/T approaches to Human-Computer Interaction. Using two voices in an autoethnography may appear to be unusual; however, as Van Maanen (2015) argues, doing ethnography is not about standardization, it is improvisational, not procedural.

The fourth tier in the framework deals with the process and steps; i.e.; the techniques by which the paper was actually produced. It was developed over a series of meetings between the two authors, ending up with the use of two voices, the autoethnographer and the active listener. Before each meeting, Niels produced a number of stories in paragraph-length text. When listening to these in meetings, Torkil asked questions guided by the literature on careers; e.g.; Hernández et al. 2010; Learmonth and Humphreys 2012; Van Maanen 2015). He would also initiate a discussion where Niels' stories were compared with his own career experiences from a decade-long attempt to develop a socio-technical approach to Human-Computer Interaction (Human Work Interact Design approach, under IFIP TC 13.6 (Nocera et al. 2015)). Torkil's questions acted as 'focusing questions' (Porra et al. 2014) that provided goal and direction for the autoethnographic writing process.

The many different stories became the topic of discussion in a meeting, followed by theoretical questioning at the next meeting. Furthermore, additional documentation in the form of books, papers, photos related to the events, as well as relevant career literature was used to support the construction of the different stories. Criteria for inclusion of an event, an anecdote or a story was that it had an important message not only related to literature, but also regarding career and field development. Porra et al. (2014) coin these steps as 'gathering and critiquing evidence.' Our iterative process and 'logic of ethnography' (Van Maanen 2015) was also informed by the discussions on the IRIS39/SCIS7 workshop, 'Scandinavian Researcher Career

Retrospectives—Special Issue Workshop.’ At the workshop, different potential authors for the special issue and one of the editors of this special issue, Arto Lanamäki, presented background, ideas and views on researcher career retrospectives. Among other things, these discussions led us to be more humble in our claims about the accumulation of wisdom, both individually and on behalf of the research field.

The text in normal font portrays the events, stories, experiences and reflections of Niels, typically written without formal references/documentation. In contrast, text in *italic*, containing the questions, framing, contextualization and reflections attributed to Torkil, will contain references, etc. In spite of the presentation format, both authors have contributed to all sections of the article.

In the next main section we have chosen to highlight selected elements from Niels’ influence on the development of the IS discipline in Scandinavia, in particular the S/T research tradition in sections 3 - 9 of this paper, under the following headings:

3. Context for EDP and IS research in the early years
4. The antecedents of a young IS scholar
5. Establishing Socio-Technical research in Scandinavia
6. Theoretical contributions of Niels Bjørn-Andersen to the Scandinavian Socio-Technical tradition
7. Contributing to community services
8. Epistemology of engaged scholarship in Socio-Technical research
9. Ten commandments for how to succeed as an IS scholar

This list of topics may seem rather accidental, and indeed, not derived from an overall rationality or a theoretical framework. On the contrary, the list has been derived as a result of a long process of inductive reasoning. First, a large number of what could be called as ‘key incidents’ in the career of Niels (the first author) were identified. Second, these were scrutinized in discussion sessions between Niels and Torkil (the second author) to clarify as much as possible the actual nature of the events and elicit the meanings of these. Third, after a number of iterations, the events were categorized into these seven sections.

3 Context for EDP³ and IS research in the early years

3.1 Early days of IS industry practice

T: When you started at CBS in 1969, it was not an empty field. Industry was developing EDP (Electronic Data Processing) systems, and at least there was a number of handbooks. Some of the most important ones were:

- *SYSKON: En bog om konstruktion af datamatiske systemer (SYSKON: A book about the construction of computer systems)*, (Andersen et al. 1972). Christian Andersen (professor) and Anders Petersen (associate professor) were both at Aarhus Business School, and they spearheaded a huge initiative with 30 senior EDP practitioners, including the third author Fritz Krogh-Jespersen, to provide a collection of best business practice.
- *Systembeskrivelse (System description)*, (Andersen et al. 1969) was the result of a similar initiative and focused on description of systems requirements with a number of standard documents intended to help the practitioner.
- *Systemarbetets metodik (The methodology of system development work)*, (Bäckström 1973) was another practitioner handbook for how to develop EDP systems, based primarily on experiences of Manne Bäckström from Sweden.
- *Systemering 70 (System development)*, (Bubenko et al. 1970) was a collection mostly written by researchers and senior students at Swedish universities, providing attempts at somehow making EDP development more scientific. This was strongly inspired by the thinking of Börje Langefors.
- *ADB (Administrative data processing)*, (Brandinger 1966) were also practical how to do handbooks based on the personal experiences of the author.
- *Systemrationalisering (Rationalization of systems)*, (Brandinger 1968).

N: I knew about those publications, and they were to some extent the basis for our development of EDP systems in Unilever in the late 60s and early 70s. They were good cookbooks and did provide a useful collection of tools and methods for practical work with describing and developing EDP/IS systems, but somehow, they were boring, far too rigid in their prescriptions, and followed a waterfall model.

Blumenthal and his book, *Management Information Systems: A framework for planning and development* (Blumenthal 1969) was for me a revelation. Here was a publication addressing IT from the business side. His recommendation of 'Total integrated information systems' also rang a lot of bells in industry, and it was strongly supported by vendors like IBM. Unfortunately, most of these bells crashed on the heads of their proponents. With the technology available at that time, it was not possible to develop such humongous integrated systems. Large Scandinavian companies such as Ericsson and Saab embarked on the process to develop such systems, only to give it up later. Ericsson spent about 15% of the budgeted \$1 billion before the project was dropped. Clearly, there was some work to be done for a young ambitious researcher.

T: So you left industry in August of 1969 to acquire knowledge about how to design, develop and implement EDP/IS systems.

N: When I worked in Unilever in 1967 - 1969, there was a desperate need for well-founded normative recommendations on how to design IS. Even today, I often comment jokingly about my career in industry, saying that I went to CBS to learn how to design IS, and since I still have not learned it, I am still here. Seriously, another reason to join academia was that I was very bored in industry. I felt there were many employees in industry that I did not consider very intelligent, not at all collaborative and not interested in EDP. It was only later that I discovered that they were resisting new technology in order to keep their jobs. Clearly, most of them did not

appreciate my wonderful new world of EDP (or IT/IS), and they continued to resist to retain their jobs. We had to do something about that. There was a need for what later became known as Socio-Technical EDP/IS research and practice. I think that this practical experience was extremely important for providing a reality check for the kind of research I did. I cannot help feeling that some of my colleagues in IS could have benefitted from more practical experience.

T: Apart from learning from handbooks, I assume there were other sources like conferences and industry contact as inspiration.

N: Yes, conferences were a highlight, especially if you got funding. From the middle of the 60s, the largest and most important annual industry conference in the Scandinavian countries was the NordDATA conference. This was organized by the data processing societies and it was mainly attended by IS/IT professionals/practitioners from companies. At its peak, it had close to 3,000 attendees. My academic colleagues and I would typically attend this conference to present our research and to get information about new IT systems, as well as to hear of barriers and drivers for managing EDP. However, the NordDATA conference died in the early 90s, and by that time, we had got a number of academic conferences, especially IRIS (see later).

T: Do you mean the IRIS conference?

N: Yes, the first regular annual academic research conference in Scandinavia was the IRIS conference. It started as a Finnish initiative in 1978 in Tampere, and it is often referred to as the first IS conference in the world. We Scandinavians like to remind the Americans that ICIS was not the first annual academic conference. I think I attended the first IRIS, but I am not sure. However, it was an excellent conference, especially for younger researchers. After the first few years, all PhD students in Scandinavia would use IRIS as the first conference for them to present their research, and they would receive excellent support and feedback on their research. In a way, you could say it was a large Doctoral consortium for Scandinavian PhD students, and I believe that at its peak, we were close to 200 attendees; e.g.; when I was keynoting in 2007. I also attended IRIS in 2016, but I was a little sad to see that the number seemed to have dropped to around 50.

3.2 Political turmoil in universities

T: A very important contextual factor for IS research in the early days was the sequence of very tumultuous events for universities in the early years when the very nature of the Humboldt University was challenged, and the governance of universities went through significant changes. The student protests had started at Berkeley with the sit-ins in Sproul Hall in 1964, and they spread like wildfire to places like Berlin, Paris and Copenhagen. Where were you in these events?

N: I had the privilege of witnessing some of the student protests first hand in autumn of 1966, when I was on a traineeship in Western Pacific Railroad in San Francisco, and lived in a side street off Telegraph Avenue in Berkeley with three students from Berkeley. I went to the rallies in the Greek theater where Martin Luther King, Malcolm X, Stokely Carmichael, Robert Kennedy and many other fascinating individuals were giving presentations. I witnessed young men burning their draft cards in protest against being sent off to fight the war in Vietnam, and I was out pushing doorbells for the reelection of Governor Brown against Ronald Reagan. That did not help! It was a time when life at universities became politics first, in relation to realiz-

ing first that education was and always had been political, and second that the governance of universities was utterly archaic. We protested that professors ran universities as their god given right, and we demanded democratization and influence on managing universities and especially education.

T: In 1968, student demonstrations had been quite dramatic at Copenhagen University, peaking in 1969 with the students' occupation of the office of the president of Copenhagen University and with the Danish government agreeing on a new governance act for universities in April 1970. This new law gave students 25% of votes in the University council and a 50% vote on the Study boards. Student influence on study boards became extremely important, since study boards decided everything about educational programs. Where were you in this?

N: I will not claim that I was the frontrunner in these political developments at a societal level. As mentioned, I was working for Unilever from January 1967, and in parallel, I was studying for my part-time Masters of Science in Organizational Behavior (September 1967 to June 1969). Furthermore, I was quite active in the CBS Student Association. I played several roles including that of treasurer for the student association, and I took part in demanding from, and later negotiating with, professors regarding the student wishes for democratization of the governance of study programs and for evaluating professors' performance in class.

T: So you were socialized as a societal rebel in Berkeley, and you brought that with you as a student in CBS, where you took part in the overturning of the old professor regime. This probably matched well with pursuing an academic career at the university in times when the university culture of work was changing dramatically towards leftist democratic ideas.

N: Today it is hard to understand the extent of change in universities from a very autocratic professor governance to an almost total democracy, where students have a decisive influence on; e.g., curriculum and examination forms. It was an exciting time. In a few years, I changed 180 degrees from a rather conservative, to a very socialist, political orientation.

4 The antecedents of a young IS scholar

4.1 Early childhood influences

Any ethnography dealing with historic academic development over five decades ought to include the beginning of the story—key incidents in childhood shaping the interests and providing the trajectories eventually leading to the career choice of becoming a researcher. Accordingly, that is where we shall start.

T: When did you realize that you wanted to become a researcher? Was it always a clear personal goal? Did you have some kind of mentoring in developing your interest in IS research?

N: I remember my grandmother calling me the 'little professor' when I was seven years old. She would come to our home every day to take care of my sister and me after school, since my mother was the main breadwinner. For many years, my mother ran a small clothing factory in our basement until one day it caught fire, and she had to establish a proper factory in the center

of Copenhagen. My grandmother was impressed with me, as most grandmothers are with their grandchildren. I was doing well in school and seemed to obtain the skill of reading quickly. I did so well that I was admitted to high school, a privilege extended only to about 6% of my age group at that time. Later, when I started studying at CBS, I often entertained the idea of becoming a professor. From the perspective of the front row in the auditorium, the life of a professor seemed very attractive. Talking about something you care about, being highly respected in society, getting a reasonably good salary, and traveling a lot! I realized eventually that the greatest reward as a professor was something much deeper: being allowed to work with young people and supporting them in their formative and extremely important years between finishing high school and starting work. When I was appointed full professor in 1987, I went to the grave of my grandmother and told her that her prediction had come true.

T: It seems clear from your story that your grandmother's trust in your abilities and your mother's sharing of how to run a factory business provided you with a role model and gave you early mentoring in becoming an 'IS type' professor. We know from the literature that role models are important in shaping and developing individual careers (Gibson 2004).

N: I did not learn any IS or IT from my family or professors at my own studies, but yes, the role models of my grandmother and mother were important in my life as inspiration for working hard in order to obtain ones goals.

4.2 Initiation to academia

For most researchers, the early choice of research field, paradigm, approaches and methods is important, since all of these determine the relevance (including value) and the expertise, which have a huge influence on later success. This section is about those choices.

T: In those days, the entry qualifications to a PhD study was a completed Master's degree, and for you it was a bachelor of business and a two year part time program in Organizational Behavior. You wrote a master's thesis on evaluation of programmer aptitude tests, which at that time were considered crucial? Is that right?

N: Programmer aptitude tests had a high predictive validity of future success as programmers. There was no doubt about that, but I also believe that there was a clear learning effect. I took nine of these tests as part of data collection for my thesis, and when I took the last one in Siemens, I got the highest score they had registered, so they offered me employment. However, I still had the idea of an academic career. At that time, I was working in Unilever on specifying requirements for a salary system for 16 unions in the company, and doing these specifications was so boring that visiting the gents was a welcome break in the work. Furthermore, when I asked my boss how to design 'EDP-systems' (Electronic Data Processing), he could not give a good answer. Accordingly, I left to do a PhD to learn how to design EDP systems.

T: So Unilever provided the industry socialization to IT, and pursuing a part-time Master's program at CBS provided socialization to academia. That is consistent with the research knowledge that socialization and individual commitment to organizations are well known pre-conditions for a career as a professor (Lindholm 2004). When you finished your master's degree, CBS offered you a PhD scholarship.

N: Actually, CBS did not offer it. I simply phoned and asked the associate professor teaching EDP. He said that he would bring up the issue at the department meeting next Thursday. When I called on Friday, he said he had forgotten, but he would bring it up the following Thursday. He did, and nobody objected. Getting a PhD scholarship in those days was a free good.

T: Well that has certainly changed. However, did CBS have a well-structured PhD school with courses, supervisors, etc.?

N: There were no PhD courses on methodologies, philosophy of science, writing of articles, etc. All we had were the summer schools organized by Börje Langefors (see later). My supervisor and I more or less had to figure out everything by ourselves. Actually, looking back, doing my PhD was an almost insurmountable challenge, compared to the support provided for a PhD study today. There were no photocopiers nor direct access to library facilities without physically going there and finding the stuff. Furthermore, there were no word processors nor electric typewriters. All was written by hand. Text had to be entered on a manual typewriter and retyped if there were changes. The only help was that we had secretaries, who most of the time did our final typing, I have to admit.

My first supervisor was the leading Scandinavian micro-economist, Professor Erik Johnsen, who, apart from the full professorship at CBS, held simultaneous positions in Lund, Turku and Umeå. For each of the first two supervisory meetings, Johnsen received 10 - 15 typewritten pages one week ahead of our meeting. However, when he twice had started the meeting by asking me to summarize what I had written in the document, I knew that he had not read it. I decided instead to ask a lecturer to be my supervisor, but although he was a nice person, he was not a great scholar, and he could not really help me.

After about one year, Associate Professor Flemming Agersnap found me. His field was organizational behaviour, but could he help! He was simply amazing, and it is quite clear that I would never have been able to finish and submit within the three years allotted, if it had not been for his encouragement and his (expressed) total faith in my possibility of completing my thesis in time. Six weeks before deadline, I told him that there was no way I could write the remaining 125 pages of the planned 450 pages in time. He convinced me that I could do it, and today I do not quite know how, but I managed. I think he read every word of the thesis, and he commented very constructively. If it had not been for him, I doubt that I would have succeeded as a scholar. To my delight, I got the Tietgen⁴ prize gold medal for the thesis in 1973, which was only awarded to one or two PhD theses at CBS every year.

T: In the relationship between the PhD student and the supervisor, there is a difference between, on the one hand, mentoring or supervising with the aim of promoting the assimilation of the PhD student into the existing system, and, on the other hand, having an inspiring 'muse' and/or collaborator who has a focus on the social relation and on the subjectivity of both the lesser and the more experienced researcher (Angelique et al. 2002).

N: Flemming Agersnap was everything from a muse and an engaged discussant to an active listener and a good proof-reader. He did not know the field of IS. However, he had the generic skills to supervise, even though he himself had not written a PhD. He showed a remarkable interest in my thesis work, and he seemed almost as happy as I was when the PhD thesis was accepted. Everybody deserves a PhD supervisor like him!

T: I understand that you also quickly made a career advancement, once your PhD was submitted?

N: You can say that. My very progressive professor Torben Agersnap⁵ did not wish to deal with administration and run the department. Therefore, at the age of 28, I became HoD of Department of Organization and Industrial Sociology, which at that time had more than 30 staff. However, I had almost no power, just administration. After two years, I needed a sabbatical to get on with research and writing. I spent the academic year 1974/75 at Manchester Business School working in the spacious office of Enid Mumford, while she was taking her sabbatical working in her home to write her doctoral dissertation. She only came in once a month, but I really learned a lot from Enid Mumford.

4.3 Starting Information Systems in CBS

T: In 1969, when you started at CBS as a PhD student, IS did not exist, except for the practitioner handbooks mentioned above. However, these handbooks were largely practical and non-theoretical, and I assume that EDPIIS was not a major topic in business schools?

N: Not at all. We had courses in programming, and I was actually teaching FORTRAN as my first teaching assignment from the first day of my PhD program. However, there was no such thing as IS in business schools, so more or less accidentally, I was recruited into the ‘Department of Organization and Industrial Sociology’, which offered the Master’s program I attended, and where I got my Masters of Science. Amazingly, I was allowed to explore whatever I wanted without any pressure to study the ‘core’ topics of that department.

T: Do you see any parallels to the situation today, where some of our IS colleagues have a narrow view of what constitutes IS, while others are more inclusive. The arguments are that, on the one hand, there is an obvious need to identify the nature of IS, to create an IS identity, and to achieve a kind of agreement internally and externally about what constitutes the core of the IS discipline. On the other hand, where is the room for creativity and innovation, for example, when we force our PhD students towards ‘mining’ the core by forcing them to read the 150 most important IS journal articles. Why not be more relaxed and allow students to explore research issues that are borderline with other disciplines?

N: If it had not been for the generous inclusive attitude of my department of Organization and Industrial Sociology, and a very liberal interpretation of what constituted the research at the Department, I could not have done IS research in the early 70s and thereby contribute to building the IS discipline. I was allowed to think out of the box. In fact, I believe that the most interesting research issues are often on the border or overlapping with other disciplines. Today, I strongly encourage my PhD students to explore borderlands, because that is where the nuggets are; e.g.; in health IT, Big Data, HCI, etc. On the other hand, there is a clear need for a strengthening of the IS discipline in general through our journals and conferences.

T: You started at CBS in a geographically small area (Denmark) and in a theoretical periphery (a business school without IS). However, the department of Organization at CBS was probably much broader, more sociological, and more organizational than the standard in business schools. During your career you researched several topics (decision support, impact of IT on job, IT strategy, etc.), which contributed to defining and shaping what we now define as core⁶ IS topics. Intertwined with this, you contributed to shaping the IS field. Your career reminds me of situated learning theory: through legitimate peripheral participation—beginning with simple, low risk tasks—newcomers start

at the periphery and gradually move towards becoming old timers at the center of a (sometimes new) community of practice (Lave and Wenger 1991).

N: You are correct. I am convinced that we should never define the core of IS too narrowly or too sharply, nor should we force our PhD students only to study the core IS topics, unless they explicitly wants to do that. Students should be allowed to explore the boundaries, especially looking into possibilities for solving problems relevant to our stakeholders.

4.4 Official Danish recognition of the IS field

T: When was IS formally recognized in Denmark? I guess it was around your early/mid-career. Were you part of establishing the rule of the game for IS research in Denmark?

N: I do not think we can talk about a specific date for an official recognition of IS in Denmark. However, I remember working at my desk in September of 1982, when the phone rang. The voice at the other end presented himself as Knud Larsen, director of the ministry of Higher Education. When he said his name on the phone, I stood up from my seat in respect! He told me that his new minister for research and academic education (Bertel Haarder) refused to recognize that there was anything about EDP/IT outside:

- Building hardware—researched at the Technical University of Denmark
- Developing software—researched at Computer Science Department in Aarhus and Copenhagen universities.

The director called me to ask whether there was something about the use and management of IT that was missing. When I said that he was correct, he asked me to draft a description of that field; i.e.; Information Systems. I had 24 hours to do so. My definition of IS in those days had four sub-fields: the development, implementation, use and management of EDP/ IT. I still find this definition relevant, albeit a little generic and perhaps ‘altmodich’ (outdated). However, it could have been one of the first definitions of IS.

T: So we might conclude that the establishment of IS in Denmark was due to a societal opportunity created by government administration, rather than driven by industry needs or visions of politicians.

N: I will not say that government was ahead of industry, but it was early that Ministry of University Education recognized IS, although the minister did not at that time.

T: It is perhaps taking it too far, but it seems as though IS research in Denmark in your mid-career can be described as ‘blue sky’ research; i.e.; without solving many of the real-world problems, which perhaps is true even today for much of IS research, as argued, among others, by Kawalek (2008).

N: Absolutely not. I was not addressing blue sky problems in those days, nor have I done that later. I totally agree with Kawalek (2008) that too large a part of our IS research is not aimed at solving real world problems, nor adding value to any of our key stakeholders: students, industry or society. Most of our research are exercises in futility, where we only pursue the goal of writing papers because we are measured on the number of publications.

5 Establishing Socio-Technical research in Scandinavia

Many of the key incidents in Niels' career became central for the forming of the specific S/T approach, which is so characteristic to the Scandinavian IS tradition. In this section, we shall first describe the early IS research from Börje Langefors, and then continue to the more specific S/T IS tradition in the Scandinavian countries that Niels has taken part in developing.

5.1 The Börje Langefors school of IS

T: I assume that from the early years of your employment, you were in search of a theoretically based approach on how to design, implement and possibly manage EDP systems, and it did not take too long before you found what we can today identify as the origin of IS research in Scandinavia?

N: Actually the book Börje Langefors: Theoretical Analysis of Information Systems (1966) should probably be called the first theoretical IS book in Scandinavia and probably even globally. When I started, I became familiar with the book. However, it was not an easy read, and, at least in my opinion, it did not present a coherent picture. Therefore, it was very appropriate that Börje Langefors organized summer schools in the years 1969 - 1971 to discuss, elaborate and further develop his theories. These were truly important events towards identifying this new field of Information Systems. No question, Börje was the center of gravity due to his experience, his ability to think in abstract terms, and his insight into how one might develop a theory of Information Systems. I remember clearly the PhD doctoral consortia in Hindås, about 30 K East of Göteborg in 1969, in Gimo, north of Stockholm (I still have a set of color slides from that event) in 1970, and in Oppdal, south of Trondheim in Norway in 1971. However, they were discontinued, and after that the doctoral consortia were organized at the IRIS conference, as we discussed in section 3.1.

Although Börje Langefors did accept Rolf Høyer, who in 1974 defended his thesis on computer-based planning systems in a hospital based on S/T theories, in his group in Stockholm, Börje Langefors did not use any S/T theories. In all his work, Börje saw the organization as a type of cybernetic system that needed optimizing, a view that was even more clear in "System för företagsstyrning" (Langefors 1968). This was a theory build on engineering and systems thinking.

This was in contrast to the S/T school, as Bansler (1989) pointed out, which saw two different systems, the technological and the social, each of which had to be optimized and balanced against each other. As I saw it, the social system were largely either forgotten or not dealt with until after the technical system was finalized and sometimes even implemented. That was the time, when 'somebody' started looking at the manual tasks. These were then grouped into eight-hour days, which was called a job. Hardly the ideal seen from the point of view of job design or job satisfaction. Terribly repetitive and machine paced jobs like 'keypunch operator' became the result, and it is not surprising that keypunch operators got pains in shoulders and backs and that absenteeism due to illness was high. To reduce the absenteeism, the Unilever manager once even drove to the home of an ill keypunch operator with a bunch of flowers to wish her good health—and to check on the validity of the illness claims.

T: I understand that Langefors acted as one of your mentors in the early days. However, you also rebelled against his overall optimization view and went along—perhaps in youthful over-optimism—with a distinction between the social and the technical.

N: Certainly, Langefors was a brilliant thinker, but to me he was not a person one talked to or with whom one argued. He was a person that talked to you. Perhaps that is a consequence of being so brilliant and in some way being the father of the IS discipline.

T: In the early days of IS, it seems that a dominant type of learning was what some researchers now refer to as peer mentoring: faculty sharing the same interest and status forming small groups for sharing job information and career strategies in order to give each other emotional support. In that way, they could explore new fields and support career building (Angelique et al. 2002). I would think that peer mentoring would have been helpful, because the S/T approach appeared to be controversial from the beginning with its distinction of the social and technical.

N: Börje Langefors was definitely a theoretical anchor for a large number of Scandinavian IS researchers, but many others like myself felt that we needed a different theoretical basis, which was not so much founded on engineering, mathematics or computer science, but was founded upon management, sociology, organizational behavior, etc. However, since we could not find senior researchers with this focus, except for the Socio/Technical school discussed at length below, there was a lot of peer mentoring.

5.2 Different IS schools in Scandinavia

T: But the Langefors tradition was only the start. According to Bansler (1989), it is possible to distinguish three major schools or traditions in the early Scandinavian IS research: the Systems Theoretical, the Critical tradition and the Socio-Technical tradition, characterizing the early days of Scandinavian IS research. Were these clearly identifiable and was there any collaboration among the researchers? It seems that there were very clear differences of opinion between the Socio-Technical approaches pursued by you and your colleagues and the more Marxist inspired critical approaches.

N: Overall, I think this is a good classification, even though some research efforts do not fit in; e.g.; Human Information Systems by Markku Nurminen. We were all very much aware of the difference between these three Scandinavian Information Systems traditions in the 80s.

Börje Langefors was a leading figure in the Systems Theoretical tradition, together with researchers like Janis Bubenko from Stockholm University, Arne Sølvberg from Norwegian Institute of Technology, Mats Lundeborg from Stockholm School of Economics and Kjell Samuelson from Stockholm University. We had good collaboration with them.

The critical, Marxist inspired approaches to user participation, humanization and co-determinations were started by Kristen Nygaard and Olav Terje Bergo in the Norwegian Metal Workers Union project in Oslo. Later it had followers such as Susanne Bødker, Finn Kensing, Morten Kyng and Lars Mathiassen in the DUE project in Aarhus, as well as by scholars like Pelle Ehn and Åke Sandberg in the DEMOS project in Stockholm.

Given the advantages of hindsight, the S/T approaches can be grouped into two categories. The early S/T IS approaches focused on organizational development. They were strongly inspired by work at Arbejdsforskningsinstituttet in Oslo (with the researchers like the Norwegian Einar Thorsrud, the Australian Fred Emery and the British Eric Trist) and Tavistock Institute

in London with researchers like Joan Woodward and later Enid Mumford. For all of these, industrial democracy was the underlying theoretical background. Key Scandinavian IS researchers in these early days included researchers such as Rolf Høyer, who did his doctorate with Börje Langefors in Stockholm and later at different times held chairs in Gothenburg, Bergen and Oslo, Peter Docherty in Stockholm, Bo Hedberg in Göteborg and later Stockholm, and I will also put myself into this group.

Later in the last few years of the 20th century and in this century, much broader S/T approaches could be called management oriented S/T approaches. Personally, I left the early approaches focusing on job design and organizational development and moved into the second set of approaches in the late 80s, where I started to focus on the broader organizational, business and management approaches. Early Scandinavian researchers in this broader S/T field included some of my colleagues from CBS like Leif Bloch Rasmussen and Thomas Skousen; Göran Goldkuhl in Linköping, Hans-Erik Nissen and Agneta Olerup in Lund. Researchers like Tor Haug from Oslo with his Wall-graph technique and Staffan Person with his systems sketches could also be classified as belonging to this group.

5.3 Theoretical background for Socio-Technical research

T: You have mentioned above that Arbejdsforskningsinstituttet and Tavistock Institute were the great inspirations for the early S/T IS approaches. However, the early research in these two places did not include IS. They focused almost exclusively on organizational development. Tavistock had large projects in coalmines (long-wall-short-wall-methods) and in the harbor docks. Thorsrud and Emery worked with self-government among others on ships and in administration, but EDP or IS was not part of their focus. Who brought those ideas into the IS field?

N: In the early 70s, Rolf Høyer was strongly inspired both by the organizational development in Arbejdsforskningsinstituttet and by the work by Langefors, and he demonstrated how transaction based IT systems could be introduced as an organizational development project in a Norwegian bank securing both effectiveness and better job design. Personally, I was more inspired by Enid Mumford and her work on measuring the negative effects of EDP and how to design better jobs with EDP.

Enid Mumford was trained as a social scientist. She did her first research in coalmines, where she would use heavy perfume to alert the workers, so that they could modify their foul language and not be embarrassed, when she suddenly turned up 1800 feet above ground. Her work on human factors and Socio-Technical IT systems first became available in the late 60s (Hoos 1961; Mumford and Ward 1968). The work of Ida Hoos (1961) was also a strong inspiration through its pinpointing of the fact that we could not assess technology (in this case EDP) on the same premises that had guided the development. That would be like the drunkard searching for the key under the lamppost, where there was light, instead of where he had lost the key. We had to develop other measures based on social sciences. These authors also inspired North-American researchers like Bostrom and Heinen (1977), but we never had any contact or research collaboration with them.

T: You have told me that the very first book you ever reviewed was a book by Mumford and Ward (1968), published in a Danish translation in 1969, and that you subsequently were invited by Rolf Høyer to meet with Mumford early 1971.

N: Yes, I remember praising the part of the book written by Mumford (who I actually first thought was a man!), while I found the part written by Ward rather traditional. I met with Mumford in a Norwegian ski resort, where she was standing with her back against the window and the sun shining through the window and her fair hair. She looked like Florence Nightingale, and I always felt that Mumford shared values and ethics with the famous nurse.

Getting familiar with the work of Enid Mumford was an important revelation to me. Here was the person who so aptly could explicate the job design and job satisfaction challenges when we designed EDP systems.

Immediately after handing in my thesis in September of 1972, I received an invitation to take part in a meeting in Moscow organized by UNESCO in order to set up a 19-country project called 'Automation and the Industrial worker.' The set-up was as a tri-party sponsored project with equal representation of employers, trade unions and researchers. Next to the main research on automotive workers, there were two later well known, excellent IS researchers, Enid Mumford from Manchester and James Emery from Wharton. Mumford wanted to study 'Impact of EDP on the bank clerk' and Emery wanted to study 'Impact of EDP on middle managers.' Meeting these two impressive scholars became the start of more than fifteen years of research on: 1) the impact on IT on white-collar workers, resulting in publications like 'The impact of Systems change in organizations' (Bjørn-Andersen and Hedberg 1977; Bjørn-Andersen et al. 1979) and 2) 'Managing computer impact' (Bjørn-Andersen et al. 1986). The underlying philosophy was that: 1) we had to see organizations as Socio-Technical systems, 2) technology is not deterministic and 3) the design of jobs and organizations is a design variable. Given the proper tools and methodologies; e.g.; the "Ethics method" (Mumford 1996) or the Leavitt model (1964), we could use IT to create jobs (good interfaces, high job satisfaction) and effective organizations; e.g.; a high level of decentralization and competitiveness as well as a great place to work. In other words, great Socio-Technical systems.

T: If I may summarize, you studied different types of IT impact studies over 15 years starting from 1972, applying a S/T framework and arguing that technology (EDP/IT) was not deterministic and that job content or organizational decentralization were design variables. However, is it not correct to say that your research had limited practical impact? A large number of Scandinavian researchers; e.g.; (Bødker et al. 1987; Ehn and Sandberg 1979; Kyng and Mathiassen 1982; Nygaard and Terje Berge 1975; Sandberg 1979); argue that Socio-Technical values were often not taken into account in the design of new IT systems in spite of your recommendations and 'fantastic models.' These and a number of other researchers formed what Bansler (1989) called the 'Critical tradition' that was using a Marxist paradigm. They were assuming fundamentally opposing interests between workers and management, with the argument that the organization should be understood as a framework for conflicts. A very explicit demand was power to the central trade unions in order that it could support decentralized action in the workplaces.

N: Yes, there was even a joke about it from this critical perspective: 'Employers are like wheel barrows, they only move when they are pushed.' Accordingly, it was the role of (IS) researchers to push employers to create better jobs.

There was this fundamental difference in perspective for the S/T tradition and the critical tradition. To make it really black and white, researchers following the critical tradition suggested pushing employers, while we suggested collaborating with employers. However, our objectives were not that different. We both wanted to improve jobs, but in the Marxist inspired tradition, this could only happen through a revolution. Accordingly, their work focused on providing the workers and trade unions with tools to enable their taking over the production assets. That did not resonate with my fundamental democratic values. To me, it was evident that management, almost all IS developers, and a vast majority of the workers, did not accept the fundamental concept of conflicts between management and workers as the basis for systems development. Of course, there is a fundamental conflict, but we found that most managers and IS developers were looking for ways to prioritize human, democratic, social values in EDP/IT designs without necessarily having a revolution and/or driving the company into the ground—at least, if it was not too costly!

First, we developed the project ‘Demokratiske Arbejdsformer, Planlægning, Humanisme og EDP’ (DAPHNE after the Greek nymph, who was pursued by Apollo. The myth is that just before Apollo overtook her, she pleaded to her father the river god for help and was transformed into a laurel tree). This was a major project with five different trade unions mainly in the white-collar sector. In this project, we developed frameworks, models, tools and techniques that could be used to create better EDP-jobs, and we collaborated mainly with trade unions to come up and present alternatives to the often rather technocratic solutions from the EDP/IT department.

Second, in the late 70s we had more than 1,000 union members (mainly shop stewards) and hundreds of IS developers on one-week long residential courses. It was my good colleague, Leif Bloch Rasmussen, who was leading these many courses ideologically as well as physically, by teaching on almost all of them. Although we cannot directly measure the effect of these courses, I strongly believe that they influenced many, especially public sector systems to become much more ‘social’ than they would otherwise have been. My edited volume, “The Human Side of Information Processing” (Bjørn-Andersen 1980) has a detailed discussion of these issues in different contexts.

However, I have to say that I did not always succeed. I remember a presentation of EDP impact on job design and job satisfaction of bank clerks to a group of bank directors in 1976 at the Royal Horseguards hotel in London. I was arguing that we should consider the social issues and give clerks more responsibility for managing their own EDP jobs. One of the bank directors commented that what we presented was ‘communism.’ Later with the trade unions, we did make substantial progress without threatening to go on strike! Overall, I think we did our best to provide compelling evidence of negative impact of EDP, and I will say that we had a substantial positive influence on actual design in the finance sector and the public sector.

5.4 Conflicts about research direction

T: These theoretical controversies between the critical tradition and the socio-technical tradition were not just playing out in the form of academic debates in papers, were they?

N: I would say that there was an almost overt conflict. Personally, I did not find a need for conflict, but it was clear that especially Kristen Nygaard, as well as several of his collaborators, saw us as the prolonged arm of capitalism using EDP (as we called it then) against the objective interests of workers.

A particularly hostile example was in 1978, when I was program chair for a conference organized by DIAG, an organization consisting of IT managers from the largest Danish companies. The conference was called “Copenhagen Conference on Computer Impact.” The conference had eight speakers, mainly from outside Denmark, including Russ Ackoff, Enid Mumford, Ian Mitroff, Peter Docherty (collaborating with Swedish trade unionists) and Ulrich Briefs (an employee within the German Automotive Union). However, since I did not invite Professor Kristen Nygaard or any of his collaborators, Kristen Nygaard managed to get interviewed on Swedish national television on what he called “An EDP conference organized by capitalism in order to investigate possibilities for oppressing and exploiting the working class,” and he threatened to have the catering trade unions blockade the conference venue. To me, this was surrealistic, but fortunately, no waiters or cooks went on strike at the conference site.

T: This actually sounds like fun to me and it seems that the controversies were important for society.

N: It certainly was not fun! I must admit that I felt strongly intimidated. Researchers belonging to the critical tradition had no respect for the research we were doing. I was seen and treated as a representative of the worst exploiting capitalists. In many ways, it was similar to the overt conflict between the social democrats and the communist parties, as we saw in politics in all the Scandinavian countries in the 1920s and again later in the 70s and 80s, at least in Denmark.

T: Do you agree with Bansler (1989) that although the three Scandinavian IS traditions were concerned with practical systems development, they were focused on different problems: the system theoretical school at rationalization and optimizing of work processes, the Socio-Technical school on job satisfaction/job design, and the critical school on economic democracy/emancipation of workers?

N: You are correct. I think that Bansler did a good job in characterizing the schools and the fundamental differences as they appeared in the late 70s to the mid-80s using these terms.

T: How do you see the three schools developing in the following years? Problems of IS are perhaps murkier today, with debates about privacy, outsourcing, cultural values (refuges, democracy), and work engagement (boring excel spreadsheet for academic work) and knowledge work being taken over by robots). The big technological innovation in IT in the 80s was office automation, which fundamentally changed office work, if not in the first years, then over a couple of decades, as we see today. Gone are the days of the keypunch card sweatshops of the 70s, as well as typing pools and huge book-keeping / accounting clerk assembly work. However, a lot of work is still very routinized and boring. Did all three schools continue, and is there still a need for the S/T IS development?

N: I do not see the research traditions of all the three schools continuing today, and especially the critical school seems nonexistent. However, the fundamental problems and issues are still there. Many have observed how the new technology is eliminating many routinized boring jobs and is potentially paving the way for enriched jobs with a lot of self-determination and self-control.

However, we also found that it was not always that easy in the 80s and 90s. Two major problems surfaced with humanism and democratization. The first was that we did encounter a lot of resistance to change. Even though by all measures, we could design more attractive jobs (better

interfaces and much more interesting jobs with more control over own job content), many employees just preferred to have their old job. They were afraid of the new. This became a conflict between humanism (the ideal defined by us and/or the trade union) and democratization (leaving the choice to the employees). The second problem was that the technology at that time was not flexible enough. We could not design enriched jobs for some and much more routine jobs for others at the same time. We had to find a standard solution, and very often, we were torn between the familiar old and the new 'ideal' job pretty well aligned with business objectives. The conference proceedings (Bjørn-Andersen 1982) and papers (Bjørn-Andersen and Borum 1979), illustrate many of these early conflicts, societal challenges and the intense search for solutions.

5.5 Growing the IS group and getting appointed full professor

T: Originally, IS was not a business school discipline, that is, internationally, in other business schools, to the extent that IS was studied, it was within Management Science, Accounting, Insurance, Supply Chain Management or other departments. How did you achieve IS becoming a discipline (a department) at CBS?

N: When I returned to CBS in 1975 after a year at Manchester Business School, I strongly felt that CBS needed to have an IS research unit. Therefore, together with three associate professors from other departments, we proposed to establish an 'Information Systems Research Group.' In many ways, that group was quite successful within the CBS environment. We had the same economic responsibilities and independence as if we were a department, and we reported directly to the dean. However, we were smaller than departments, we were not recognized, and we had to teach more than anybody else did. However, we had our freedom to decide on research strategy. We were also given funds to have professor Börje Langefors as visiting professor for a year. However, as he maintained his professorship at Stockholm for the full period, we did not see him that much, and we never managed to integrate his work well with that of ours. We could not get him to comment on our work beyond getting references to his own work that he felt we needed to take into account.

T: But you also had other visiting professors, and you yourself had visiting positions at other universities?

N: I strongly believed that IS in isolation in a small Northern country like Denmark was a blind alley, so I invested a lot in securing funds to invite visiting professors like Angele Cavaye, Ken Eason, Kalle Lyytinen, Ida Hoos, Dan Robey and Jon Turner. I also felt that I had to spend time at other universities, so after visiting Manchester Business School in 1974/75, I had longer research visits at University Paris IX Dauphine, University of California in Irvine, University of Lund, Australian Graduate School of Management in Sydney, and University of Canterbury in Christchurch. I learned to think and write in English, but it also gave me a fantastic insight into how to manage IS university research in different ways and in different contexts. Most of the time, my visits were driven by knowledge about interesting research environments, but all visits were organized through contacts and networking with specific individuals.

T: So IS research at CBS began without a professor in IS. However, when the professorship was advertised was it a professorship in Socio-Technical IS or in something else?

N: It was difficult to get a full professorship. When it was first advertised for me to apply, I had written the draft of the job description to match my qualifications (!). However, the chairperson of the committee found that I was too politically leftist, since I had worked with trade unions. Accordingly, he traveled around to the other four members of the committee for one-on-one meetings, where he convinced them not to consider any of the five applicants to be qualified for a full professorship. This hugely hampered the growth and acceptance of the IS Group in early 80s that we did not have a full professor.

A new opportunity came four years later because the Department of Accounting at CBS was divided due to internal fighting. Then the Faculty board proposed that our IS group should be merged with one of the two accounting groups. The price they offered was to advertise a full professorship in Information Systems (not specifically in S/T) for me and of course everybody else to apply in autumn of 1985. The evaluation took 18 months, and this time the decision was 3:2 in my favor. Actually, the chairman of the committee voted for another candidate from his own department. His argument was: “Niels you will for sure get a chair some time, so it is politically better that we give this particular chair to NN—who is a good researcher in Organizational Behavior, and who knows something about EDP.” This episode took me two decades to forgive. It was very political.

T: Perhaps it is fair to say that forming the IS research group and becoming professor in IS required breaking some established boundaries and traditions where politics always seemed to play an important role. A few decades after the 80s we saw global growth in the number of IS departments, but now it seems to have gone down due to the global tendency of creating larger departments. A number of well-known business schools no longer have independent departments. Harvard does not even have one full professor in IS, nor does LBS, and LSE have merged IS with Management. How do you see this development/downgrade of IS research? How does it feel to be a late career person in a dying field? Will you recommend that we change our research field away from IS?

N: Of course the field is not dying. I am convinced that there is an important role for IS to play in the future. Today digital innovation is the most potent driver for innovation, and we have the keys to the magic kingdom. We are in a better position than any other business school discipline to predict the advent of new IT, to understand the implications for individuals and organizations, and to develop appropriate strategies. However, it is mandatory that we become much stronger in meeting the demands of our three groups of stakeholders. If we do that, we can grow individually, and we can contribute to others in the field (Arnold and Clark 2015).

5.6 Funding Socio-Technical research

T: In many lines of research, external funding has provided the basis for expanding research productivity. You did not get any large Danish research grants in those days, but you got quite a few international ones?

N: In the early 80s I made the deliberate decision that since there were ‘plenty’ of EU grants, it made good sense to ask for international grants and leave the national grants to other Danes. It also meant that I could travel, which I liked. I think that I have probably been able to fund two - three researchers on CBS budget every year for the last 40 years. In the early days, I carried out research for EU institutions such as CEDEFOP, the EU Joint Research Center in Ispra, and

the European Center for Improving Living and Working conditions. More importantly, I later got several grants from the large EU research programs like ESPRIT, Fast and several of the so-called FPs. One example was in 1988, where I was invited to a meeting in Brussels together with about 200 other researchers, industry representatives and other lobbyists. The task was to draft the next ESPRIT program. When I came with my pencil and no other tools for drafting research programs, I was told to chair a group with four industrialists to draft a research program about “Quality of Life in the Information Society” (QLIS). The budget envelope was 1,500 person years! A totally impossible task, but we jotted down a heap of ideas, and eventually I got a grant of € 2.7 million for three years of 1990 - 1992. However, as project manager, I could not easily boss around Fiat, Cap Gemini and Siemens. Fiat asked me to draft their exploitation plan for what Fiat could do with the QLIS results. For the review meeting, Fiat was a little apprehensive about the outcome, so they brought one of the most influential European industrialists, Gianni Agnelli (and his four body guards), to the review meeting in order to impress and intimidate the reviewers. However, he was very poor in his explanation of (my) exploitation plan for Fiat, and the reviewers were not impressed.

T: How do you see the future prospects for obtaining funding for S/T research?

N: The opportunities have never been better. The public funds, especially in the EU, are immense. The current Horizon 2020 program explicitly asks for multidisciplinary research and integration of social and human sciences in development of new technologies. To me, it seems that reviewers, evaluators and the political decision makers are keen to integrate IS knowledge. Of course, it requires that you make an investment in time and effort to familiarize yourself with the programs, take part in preparatory meetings, take part as a reviewer of proposals to build up your competence regarding the process, and build up an international network to apply when opportunity knocks. If you wait until the calls for proposals are published, it is usually too late.

Furthermore, there are huge possibilities for collaboration with industry. One certainly needs to be in close contact with industry and develop research relevant to them; i.e.; be useful. Universities in the German speaking countries are excellent in that, and we should copy what they are doing (Schubert et al. 2014). I am impressed with how the German universities can be extremely useful to industry and consequently get huge funds from them; while at the same time can be so dominating in Europe when it comes to scientific publishing. In recent ECIS conferences, almost half of all papers submitted have at least one German author.

6 Theoretical contributions of Niels Bjørn-Andersen to the Scandinavian Socio-Technical IS research

An autoethnography for a researcher does not seem complete without an account of his/her scientific footprint. Accordingly, in this section, we have attempted to group Niels scientific contributions under four headings, and in the process point out the red thread running through his research work.

T: Some researchers are known for one large significant theory that they have exploited for decades. In the Socio-Technical tradition, for example, Peter Checkland with his SSM (Checkland 1981),

Mats Lundeberg with his ISAC method (Lundeberg 1982), Ken Kramer with his large scale societal impact studies of new IT (Kraemer 1969), Enid Mumford with her Ethics Method (Mumford 1996; Mumford and Weir 1979), and Trevor Wood-Harper with Multiview (Wood-Harper et al. 1985). Did you develop one such grand theoretical gestalt, or can you point to a text that explains your approach to Socio-Technical research?

N: I never developed one (grand) theory, which I have nurtured, refined and tested in many different settings for decades. It is, of course, up to others to judge whether I have played my cards optimally, or whether I should have done things differently. Largely, I have been rather opportunistic in my choice of research topics, focusing on what I found most interesting and relevant to students and industry at that particular point in time. On the other hand, I will claim that I have consistently applied a Socio-Technical research paradigm for a large number of new technologies and in many different contexts. However, that was never a conscious decision. I would claim it to be an ethic value orientation.

6.1 Decision support

T: Your first major research was your PhD on Decision Support Systems. However, that term had not been coined when you were working on your thesis, was it?

N: There was a substantial amount of research in Management Science focusing on scientific decision-making. This was frequently done using different optimization models for tasks as diverse as estimating the amount of cash to be available in the bank branch in the morning, the number of cashier tills to open, given the size of the queue, or how much stock to keep. My contribution here was an attack on the dominant paradigm of the economic man defined as the rational, objective ideal for all types of decision-making. I documented that decisions of senior management at the strategic/tactical level were not optimizing decisions. They were at best satisficing or even just muddling through (Lindblom 1959). However, if satisficing and muddling through models were dominant, we had to design IS differently from what the Management Science researchers proposed. In doing this work, I thought that I had invented Decision Support Systems—only to discover a few months before my dissertation was finished that Michael Scott Morton had published his book “Decision Support Systems” (Morton 1971). Good ideas can surface in many places almost at the same time.

This was not a typical case of Socio-Technical research, but it clearly demonstrated that it did not make sense to design/optimize only the technical system; we had to take the social issues into account as well. What is the use of designing a perfect system, if nobody uses it?

T: Your work on DSS is, of course, central in IS work, but it is at most peripheral to S/T. However, I guess one can say that, to some extent, you were defining the requirements of the technological systems to fit with the requirements of the social systems. Furthermore, you were exploring another way of identifying requirements for IS. In those days, IS was typically developed to support company functions through automating existing functions. Other researchers later emphasized goals/objectives of the company; e.g.: (Langefors 1966; Sjöberg 1969), Critical Success Factors and Critical Failure factors (Bullen and Rockart 1981), or speech-act (Auramäki et al. 1988). In retrospect, none of these attempts were successful until we got the idea to focus on business processes (Davenport and Short

1990). However, your early work on identifying decisions is to some extent still relevant for the current strong research efforts in Business Analytics, Business Intelligence and Big data.

N: I also think that the work on DSS was important at that time. In 1971 at the University of Lund, Ingeman Abnor and Björn Bjerke developed a huge asset management model with 800 variables. They tested it on data from Göteborg Sparbank, and the model showed that the bank would go in the red in 1974. Everybody regarded the results of the model to be wrong, but the bank went in the red in 1974. We developed a much simpler forecasting model in FORTRAN with the 20 most important cost and income variables from the annual statement of the bank. When we tested the model on the Danish SKS bank, it showed that the bank would go in the red in 1974. After having checked that there was no mistake in the model, we assembled the 120 top managers of the bank for a two-day seminar, and asked them to forecast the development of the major cost and income variables. They discussed long and hard and agreed on the values to put into the model. When we then ran the model, we got the same result that the bank would go in the red in 1974. In response to that, the managers assembled agreed to the at that time famous “17, 14, 10 strategy of the bank” — named so because costs for the next three years could only increase with those figures. As a result, SKS became one of the few banks in the Scandinavian countries not to go in red in 1974 and 1975.

6.2 Identifying computer impact and normative solutions

T: When companies introduced EDP/IT in the 70s and 80s — and some might argue that they even do it today — it was done predominantly on technical premises. According to the literature, especially in these early years, the aim was profit maximizing; the organization was seen as a cybernetic system, where employees were sub-systems that had to fit in with the new technologies being introduced (Bansler 1989).

N: That is correct. The systems I studied had many adverse consequences for employees; e.g.; redundancies, alienation, stress, routinized work, machine pacing and lack of privacy; and there seemed to be a need for balancing the technical requirements with requirements of the social system. Especially bad examples were the positions as keypunch operators mentioned above. Employers would argue for 12,000 keystrokes per hour, trade unions would argue for 10,000, and eventually they would agree on 11,000. However, none of the negotiators had ever used a punch card machine. The job content was terrible and clearly detrimental to health.

We did not see any possibility of optimizing the Socio-Technical system as Långfors (1968) was arguing. Instead, we believed that it was necessary to analyze the requirements in the two systems and find a satisficing solution. This was in line with Simon (1949). Accordingly, it became vitally important to identify human/social requirements that could be used in balancing the economic imperatives, given the technological constraints when developing a new IS/IT system. That was a massive challenge.

T: Has the challenge been met or is it still relevant? It seems to me that the majority of current IS research focuses on technology rather than the development of technology. They study human agency rather than human requirements. Perhaps there should be room for a new interpretation of the S/T approach. Maybe we need to coin a new term? From an HCI perspective, I would suggest human work interaction design (Clemmensen et al. 2006; Nocera et al. 2015).

N: I think it is still very relevant to take human and societal perspectives/values into account when designing systems. Of course, technology is much more flexible today than it was 40 years ago, but it is amazing that we still do not seem to get it right. Interfaces are still often impossible, and many systems; e.g; Microsoft Word; require extensive training to achieve mastery—if ever! Furthermore, many large societal systems are typically still twice as expensive as originally foreseen and hopelessly behind schedule when being implemented.

6.3 Information systems strategy

T: When you realized that the S/T strategies working with trade unions did not always have a high effect, you became more interested in IT strategy as a way to influence system design, implementation and management.

N: We worked with several trade unions; e.g.; the bankers' union, to help them formulate strategies for co-determination regarding the impact of systems on the role of bank clerks. However, we were often not given access to those that made the final decisions. Management was not prepared to give up the right to make the final decisions. Accordingly, we had to come up with strategic tools to facilitate that process. I became very interested in IT strategy after my visiting position for six months to University of California, Irvine in 1987 and my collaboration especially with John King. We developed new courses, and I read a lot of US based textbooks on MIS and Management of IT. We modified those to match a Scandinavian context, primarily through adding the analysis of jobs, suggesting user participation in development, and having more socially/human values guiding IT management. For a while, I thought that we did have proper answers for how to design modern IS/IT.

6.4 Towards ambient organizations

T: After the breakthrough in office automation in the 80s, and all the time looking at systems supporting the individual and the organization, the next big thing in the 90s became inter-organizational systems. For this work, you had obtained an EU grant to work on EDI. Would you say that you also studied EDI using S/T theories and methodologies?

N: Yes, still S/T approaches. As mentioned earlier, we realized that it did not make sense to study organizations in isolation. No organization is an island, and that insight led to research on inter-organizational systems. I had a very nice project with, among others, Helmut Krcmar and Ramon O'Callaghan. We did 16 case studies of major EDI developments and implementations in Europe. For the first time, we used a CSCW tool for writing the introductory and final chapter of the book. We sat in one large room, and each of us could write on the document that we could all see on screens above our heads (Krcmar et al. 1995). I was so impressed with the opportunities offered by this Group Systems tool that I started a company selling such systems, but that went belly up. Actually, it is surprising that it has taken so long for such systems to become a backbone of scientific collaboration.

T: But would the S/T be adequate for the huge jump in technologies with the Internet and WWW? It seems to me that not much is left now of the job design and organizational theories.

N: Rightly so. However, now the focus came on the interface level. HCI and UX became critical for whether an e-commerce system, a smartphone application or an Internet service was adopted. The knowledge we so painstakingly had achieved and assembled for employees in the 80s were in most cases also relevant when developing and deploying end user applications. Furthermore, e-business strategies for identifying new services and for building new companies could largely draw on S/T theories. I started the Center for e-commerce at CBS in 1998, and no less than 230 individuals were crowding our largest auditorium at the inauguration. Never in my life had I felt that there was a bigger interest from industry in my research. Everybody could see that their skills could be made redundant and that they could be intermediated by the Internet and WWW. Everybody wanted to hear about the early experiences. Looking back, most of my predictions; e.g.; the one from 2000 that 10 percent of retail would be e-commerce in 2010; were not exactly on target but at least clearly within the dartboard. However, most observers, including Gartner Group and McKinsey (as usual), exaggerated the short-term changes and totally underestimated the long-term implications.

T: If you are prepared to forecast the implications of future development of Internet and all the other knowledge enhancing technologies using S/T, how will these technologies influence our future way of organizing? Is it possible to apply an S/T framework for that too?

N: I strongly believe so. Already in 2003, I applied for an S/T research proposal under the EU program FP4, together with a large group of European scholars. The idea was to investigate and propose a strategy for designing future organizations, taking into account the abundance of future ambient intelligence in ambient technologies. I suggested the term 'Ambient organizations' as the ideal type for an organization using advanced storing, processing and communication technologies for dismantling the traditional organization and creating a type of virtual organization. We did not get the EU grant, but the term has followed me since. In 2014, I published a framework for how I saw organizations dismantling traditional commodity and non-core processes through increasingly transferring functions/business processes to others. It is a framework with five levels of increasing arm's length. The five levels were 1) creating special profit centers inside the organization, 2) making them independent companies, 3) outsourcing them, 4) getting these processes performed in the cloud as standard services and 5) crowd-sourcing. I believe that in the future, organizations will have transferred many more commodity and non-core processes from the hierarchy to the market (Bjørn-Andersen and Raymond 2014). One example has been how Lego crowdsourced ideas for new Lego sets (Schlagwein and Bjørn-Andersen 2014).

T: Summing up, your personal theoretical contribution to Socio-Technical research falls in four categories: 1) Identifying decisions as the key basis for defining requirements and the development of IS in general and Decision Support Systems in particular, 2) Understanding the impact of IT on the job content/job satisfaction, and developing models for designing what you called the human side of information processing in order to enrich jobs and create more effective organizations, 3) Enhancing business strategies with e-commerce, e-business, and what you called e-Management and 4) Developing new organizational forms and inter-organizational eco-systems, creating what you have called ambient organizations.

7 Contributing to community services

University and business scholars contribute primarily in three dimensions: research, facilitation of learning in educational programs, and academic services instrumental in shaping a research field. In this section of the paper, we focus on the academic services of Niels, which have contributed to creating the Scandinavian and global IS community while at the same time have been instrumental in shaping his career.

7.1 Establishing the first IS association in Europe

T: In the 70s, the field of IS had not been recognized as an independent research field. Some IS research was done in the department of computer sciences in the faculties of science or engineering, and there were a number of individuals in faculties of social sciences or business schools. When did we see the first associations?

N: One of the ambitions of Börje Langefors was to establish a Technical Committee of Information Systems within IFIP (International Federation of Information Processing). IFIP was established in 1959 as the prime professional society within computer science under UNESCO. It was very influential; e.g., through its definition of the CODASYL standard paving the way for COBOL. All work was done in technical committees, and TC-8 was established in 1978 with officially appointed national TCs, one per country.

T: To what extent were you active in that process?

N: Börje Langefors personally invited me to the inaugural meeting, and later that year, the Danish Data Processing Association appointed me as the official Danish national TC-8 representative. It helped me form an international network, and I enjoyed the traveling and meeting with other researchers. The initial meetings were quite tumultuous, since we could not agree on aims and scope. After a year, TC-8 decided to have two different Working Groups: WG 8.1 Formal Methods and WG 8.2 Environment of Information systems. The overwhelming proportion of the attendees in the first meetings were interested in formal methods, including Janis Bubenko, Bill Olle, Colette Roland, Ron Stamper, Arne Sølberg and Alex Verijn-Stuart. If I recall correctly, in the beginning, WG 8.2 also included Gordon Davis, Rolf Høyer, Mats Lundberg, Henk Lucas, Burt Swanson, and it would later include people such as Rudy Hirschheim and Richard Welke.

The de facto main purpose of the WGs was to establish conferences, and since there were only two nationally appointed TCs in WG 8.2 (all the other national TCs were in WG 8.1), I automatically became a member of the conference committee for all the important early WG 8.2 conferences. Some of the early key conferences were the Manchester conference on “Research methods in information systems” (Mumford et al. 1985), the conference on “Information Systems Assessment” (Bjørn-Andersen and Davis 1988), and the conference on “Information Systems in developing countries” (Bhatnagar and Bjørn-Andersen 1990).

T: There can be little doubt that those conferences helped to establish the identity of an IS community internationally, and it seems clear that it also helped you in becoming very visible as an IS researcher. Socialization and having an environment with structured opportunities are important for academic careers (Lindholm 2004); IFIP TC 8 provided a good platform for you as an S/T researcher

aspiring to become a professor. I myself have done something very similar with a series of conferences in the IFIP TC 13.6 WG.

N: I have to say that I enjoyed it, and I strongly believe it helped many isolated IS researchers connect to others who shared their interests. These conferences went a long way towards establishing the IS field, especially in Europe.

7.2 Developing the first European directory of IS academics published in 1992

T: The European IS scene was quite fragmented in spite of these conferences. A substantial barrier was that in continental Europe, it took several decades before English became the dominating research language. Before that, German researchers would publish in German, French researchers in French, etc. Furthermore, contacts were not that easy in the 70s and 80s before email.

N: I was the first researcher in CBS to get e-mail in 1987, and I did not get telefax (if you still remember that) until 1988, when I bought the first telefax at the school for no less than € 4,000. I was strongly critiqued for that huge expense. Why could I not make do with airmail? Frankly, I could not see how I could run a large ESPRIT project with more than 30 researchers without a more effective communication vehicle. Amazing to reflect that it is less than 30 years ago, that e-mail started to become one of our research tools.

T: Identifying and getting in touch with colleagues was not a piece of cake, when the main type of communication was airmail or phone in the 'good old days' before Internet and WWW?

N: Correct. Accordingly, I started on a multi-year project with our own department funds to establish a European IS directory. I needed it for organizing the conferences, but we also needed it for identifying collaboration partners for EU projects, for identifying reviewers for projects/papers, etc. In the late 80s, it was still only printed using a Word processing machine. In 1992, we published the directory as a proper book, and in 1996 we stopped updating and maintaining the European directory, since it was folded into the AIS IS directory.

T: I think you are pointing out the influence that IT has had on the way we do research and hence also on how our careers are shaped. The increasing influence of social media, including the social media on academic careers, is not well understood yet (Veletsianos 2013), but you clearly felt the need for collaboration media.

N: Communities strongly need collaboration tools. I did spend quite a bit of time and effort on Computer Support for Collaborative Work in the 90s. I also tried to promote it as president of AIS in 1996, especially to connect and support researchers in developing countries. However, it was not until Blake Ives became president of AIS that we got a state of the art IT support for AIS members.

T: What was the influence of Scandinavian S/T on AIS?

N: I am not aware of any large influence. There have been several US based researchers, who have been interested in Scandinavian S/T IS. Most of these have found a home in IFIP WG 8.2 and a couple of other WGs of TC 8.

7.3 Changing ICIS from being an all-American conference to becoming global

T: Although you had this high involvement in IFIP, you were also active in ICIS, which originally was an all-American conference.

N: I did not take part in the first ICIS in 1980. At that time, the conference had the name Conference of Information Systems, and there were exclusively North American participants. I think I joined the first time in Ann Arbor in 1982, but I was impressed with the conference. At the ICIS spring planning meeting in May of 1985, I proposed to host the conference in Copenhagen. At the end of my sales pitch, Professor Jim McKenny of Harvard asked “whether there was any MIS research in Europe” and Professor Henk Lucas of NYU asked “how many hours of daylight we had mid-December.” I did not comment on the insult of McKenny, but commented to Lucas “seven hours of daylight—but think how much one can accomplish during the night.” I got overwhelming support to organize ICIS 1990 in Copenhagen, although there were considerable financial worries and skepticism about organizing the conference overseas. McKenny and Rockart forced us to budget with a break even of expected attendance of 400, even though I was convinced we could get at least 500 if not 600 attendees. In fact, when we reached 854, we had to turn away people who wanted to register at the door. It became a huge success, also financially, and people still talk about Copenhagen as a very attractive venue.

T: So it was you personally—your personal interest in IS research—that moved ICIS to Europe for the first time, despite there being little recognizable MIS research at the time. Of course, there was plenty of IS research in Europe, but it was not called MIS or IS. Interestingly, today similar translators are working to move HCI conferences such as IFIP INTERACT to new venues such as Mumbai in 2017, despite the fact that HCI research in those countries is only emerging. It is a good example of how the individual career trajectories merge with regional and organizational developments.

7.4 Fighting for the turf of IS

T: Establishing a field of IS was not straightforward. There must have been a number of obstacles and turf wars! There is always the question of fighting for resources, what science is, and why IS is even relevant. Did establishing the field in Scandinavia require you to apply your (own) rules for, and definitions of, IS?

N: I took part in several evaluations of IS and computer science in the Scandinavian countries. In fact, I have been a member of nationwide assessments in both Finland, Norway and Sweden at different times. I have also been at about ten assessment committees for professorships over the years in Scandinavia. I might mention a particular interesting evaluation experience.

I was a member of the committee tasked to assess IS and computer science in 19 institutions in Finland in five days. There was a strong confrontation with computer scientists. We were two IS researchers (Burt Swanson of UCLA and myself) and five computer scientists on the committee. However, one of the US evaluators was born in Finland, and he was extremely conservative. He refused to give any evaluation of the IS groups because it was not a type of science he understood, and he seriously questioned that it was science. I had to take a strong stand, and I declared that if he was not prepared to evaluate researchers like Juhani Iivari, Pertti Järvinen

or Markku Sääksjärvi, I would not evaluate Teuvo Kohonen. The latter was admittedly a world-class researcher (now emeritus) within artificial neural networks and self-organizing maps (Kohonen maps). However, this was clearly not my field, and I did not understand the underlying concepts. Accordingly, if the US computer science professor would not assess IS, I would not assess Kohonen. There was a serious risk of the whole evaluation process breaking down, but in the end, the chairman managed to get the US professor to sign the joint document, including a nice evaluation of IS in Finland. Among other things, it created a basis for the very successful virtual PhD school in IS, where one professor (in the early days professor Pertti Järvinen and later, among others, Markku Sääksjärvi) ran the PhD school for students across all Finnish IS departments. That had a huge positive impact on the Finnish and Scandinavian IS development.

T: Do we still see examples of such political processes in Scandinavia?

N: I think so, but probably not so overt. IS is now well established in many places, and, as I have said before, I think IS in general and S/T in particular have a bright future.

8 Epistemology of engaged scholarship in Socio-Technical research

An autoethnography about an IS researcher should include not only the beginning of the career as we mentioned above, but also say something about the end of the career. In his retirement speech, Niels reflected over the role of research in society, and voiced his concern about what he perceived as an increasing lack of relevance of IS research. This section presents the essence of these concerns at the end of a long career.

8.1 For whom do we work?

T: Some may argue that IS in general and business schools in particular have been dominated by attempts to solve practical system development in the rich OECD countries, that we have not really contributed to development of theory in the social sciences, and that we are really an applied science. Do you agree?

N: I think we are and that we should see ourselves as an applied science to be judged on our contributions and not our theories. Business schools in the 50s were strongly criticized for being trade schools and not scholarly in two major reports from Ford Foundation and Rockefeller Foundation. There was a demand that we had to be more scientific; i.e.; copy the economists. That is indeed the direction that business schools have taken since. To my mind, we have gone overboard, when all that matters seems to be number of journal publications in the best journals and our H-index (Bennis and O'Toole 2005). One of the hallmarks of my research has been the collaboration with stakeholders, trade unions, industries (banking, shipping, IT vendors), governments; e.g., in Denmark, Greenland, Faroe Islands, Sweden and Tanzania; and a long range of individual companies (from small upstart companies to industry giants like Cap Gemini, Fiat, IBM, Maersk, Microsoft, SAP and Siemens). The main purpose of this is to ensure that the research is benefitting somebody, who, one way or another, is funding my research through

taxes. I believe that there are several excellent ways of producing new knowledge through collaboration with industry (see Schubert et al. 2014).

T: Did you always know why you were doing what you did?

N: I firmly believe that all through my career I have been conscious that somebody was paying for my research. Why should taxpayers pay for me enjoying myself and studying whatever I pleased, if it would not benefit somebody? Accordingly, I felt that my research should be of value to at least one of the major stakeholders, students, industry or society. I am pleased to see that this view is surfacing in several places. While deans are busy counting the number of journal publications, some governments are asking: “What is the impact of your research.” They are not asking about citations; they are asking for valuable impact. The British Research Assessment Exercise, which in 2014 was replaced with the Research Excellence Framework, has an evaluation category called Impact counting for 20% of the scores. Here, impact is defined as “change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia.”

T: Has your research had such an impact? S/T IS research has been criticized for not having a significant impact on practice in IT companies or in companies developing systems and implementing them.

N: I think we had an impact. We knew that if we failed, workers would lose job-satisfaction, labor unrest could unfold, implementation would be cumbersome/impossible and systems would be too costly. I was involved in large surveys documenting the extent of the problems, in-depth case studies provided the basic understanding of the problems, and theoretical work paving the way for a large number of methods, tools and guidelines for worker involvement and design of jobs/organizations; e.g.; (Arnberg and Bjørn-Andersen 1984). Furthermore, having more than 1,000 shop stewards, systems designers and employees of IS/IT vendors on one week long courses took its toll on me and my co-workers. However, we are convinced that it had a substantial impact on the way systems were decided upon, how they were developed and how they were implemented in Denmark and, to some extent, abroad. Compared to systems development in the UK or US, it is clear that there was a very different set of systems designer values (Kumar and Bjørn-Andersen 1990). While North-American developers prioritized being on budget and on time, Scandinavian developers prioritized that the systems should first and foremost meet the specifications, including social/organizational values. In order to achieve that, Scandinavian developers rather accepted project delays and budget overruns.

8.2 Socio-Technical theory and engaged scholarship

T: Even though you may categorize your research as Socio-Technical IS research at least in the broader definition you have suggested, you have recently called for a stronger focus on engaged scholarship in IS research.

N: I think that all my research can be labeled engaged scholarship. In accordance with that view, we cannot provide value to our stakeholders if we ignore new fads, new technologies and new management concepts. If the rest of the world does not want to talk about systemering (a magnificent English word invented by Börje Langefors in the 70s, but never recognized globally), it makes no sense to use that. If the world talks about big data, business intelligence and

business analytics, there is not much sense for us in talking decision support. If the world talks about cloud computing, there is not much sense for IS researchers to insist that it is not really in a cloud and that a service bureau or a facilities management solution is the appropriate academic term. Finally, if after 40 years of trying to teach the world the concept of Information Systems, and they still do not get it, I think it is better to say something like 'Management of IT.' After all, concepts are for improving communication.

T: Ok. What can be done to achieve higher impact?

N: I believe we have had, and can still have, a huge impact by becoming more relevant and solving more real life issues in companies or society than what is done in many other business school disciplines. One thing that could really help achieve this is having Design Science and Critical Realism in case studies. In my opinion, that should be the preferred epistemology and ontology in IS.

8.3 Socio-Technical research and sociomateriality

T: A major stream in IS research in recent years has been sociomateriality. This merger of actor network theory, feminism and S/T research suggests that human actors and technological objects are to be understood to emerge in sociomaterial assemblages (Orlikowski 2007; 2010; Orlikowski and Scott 2008). This seems to be a genuine IS contribution to social science that could replace S/T research, even in Scandinavia. What do you think? Can sociomateriality and engaged scholarship be partners in the future?

N: I think it is interesting that you bring up sociomateriality. In many ways, I see sociomateriality as a natural extension of S/T research. I followed it early; e.g.; at ICIS conferences; where Wanda Orlikowski initially presented her ideas and later in publications such as her seminal article with Susan Scott (2008). I agree with their critique that we cannot see the social and the technical as two independent entities. I do not think we ever did that, since there is a constant evolving dialectic relationship between the two. Technical designers do not live in a vacuum blissfully unaware of the social/organizational context in which their systems have to work. In the same way, organizational designers, consultants and managers were never totally unaware of the technological features and development trajectories.

I think it is valuable that sociomateriality is bringing that to our attention. However, it has not helped me to better understand how to develop systems, how to manage implementation or how to identify exciting IT inventions/innovations. I perceive sociomateriality as being too theoretical and abstract to provide real guidance. One might perhaps say that the most valuable contribution is to see sociomateriality as a commentary to mainstream IS research, not really as a contribution to practice. I cannot see sociomateriality as engaged scholarship, but that is for others to determine.

T: Is this somehow related to the famous quote that "there is nothing as practical as a good theory" (Lewin 1945)?

N: My own professor, Torben Agersnap, used that quote very often, when he was challenged on the weird research we did in the 70s and 80s at the Department of Organization and Industrial Sociology at CBS. However, one might also interpret the sentence to mean that if a theory is not practical, it is not a good theory. I do not know whether it is fair to say that, but I found

many theories of little use. Leonardi (2013) even makes the point that in the last 20 years, no Nobel prizes in Medicine have been given for theoretical developments. They have all been awarded for new methods. If a new theory does not help me understand a situation better, if it does not help me design better systems, or if it does not create value for the relevant stakeholders, I somehow lose interest in those theories. That is how I feel about sociomateriality.

In my opinion, this is consistent with the analysis by Robey, Anderson, & Raymond (2013, p. 379): “We adopt a socio-technical perspective that differs from a strict sociomaterial perspective insofar as we wish to preserve the ontological distinction between material artifacts and their social context in use.” I agree with that.

Summing this up, I have come to the conclusion that the most important recipe for the long term survival for us as IS researchers is to provide value to our stakeholders (students, industry and taxpayers). It is not sustainable that most of our time, effort and intellectual contributions go into writing papers read by fewer and fewer, and which are irrelevant to all of our external stakeholders. It is an exercise in futility, if we only write papers because we get measured on the number of publications. That option does not lead us to conquering the world!

9 Ten commandments

T: Niels, would you like to give us a few parting words of wisdom for younger researchers?

N: Over the last few years, I have been giving talks on a number of PhD gatherings, and I have come to structure my recommendations into *Ten Commandments* about how to develop a strategy for success as an IS researcher:

1. **Choose your parents wisely.** So much depends on your social context. For instance, in some countries, higher education is free; in other countries, parents can afford to pay for it, if they are wealthy. However, there are also countries, where it is a huge challenge.
2. **Choose your name wisely.** Having a name like Niels Bjørn-Andersen with the Danish letter ‘ø’, a hyphen and ending with -sen rather than -son, is not wise. Early on, I should have settled for Niels Bjorn! Furthermore, it feels as though I am shooting myself in the foot when I introduce myself using the Danish pronunciation of my first name, where the two vowels in Niels in Danish are pronounced like in Nelson and not like in Nile. If my English-speaking friends heard me correctly and remembered my first name, they would spell it Neils, and they do that all the time! There is a lot to be said for choosing a name like John King! Choosing ‘Supra’ as nickname, when you are christened Suprateek is wise. Having a surname early in the alphabet is also useful when authors are listed in alphabetic order. In about one third of my co-authored publications before I got the full professorship, authors were listed alphabetically, so now they are Bjørn-Andersen et al. (19xx) and my co-authors were reduced to being ‘et al.’ In the famous book, March & Simon: Organizations (1958), there were originally three authors, but Guetzkow was on sabbatical when the book went to the publishers, and with alphabetical ordering, he would have been the first author; accordingly, March and Simon decided to take him off the author list and thank him in the foreword.

3. **Choose your working language.** I wrote my PhD thesis in Danish. Not wise. It was used for some years in Scandinavia, but not many outside Scandinavia like to read in Danish. For better or worse, English is now necessary. At CBS, we have switched to having English as our working language both for written and oral collaboration.
4. **Choose your alma mater to maximize your chances.** There is a huge benefit in graduating from a well-reputed international institution where the working language is English. Reputation and network can carry one a long way. Peter Keen got his undergraduate, graduate and PhD degrees from Harvard, Stanford and MIT. It opens many doors, even though Peter would have excelled without.
5. **Pursue a Real Option strategy.** It often pays to keep one's options open when it comes to choice of research topic, collaborators and employment opportunities. Meet as many senior scholars as possible, take part in doctoral consortia, submit papers to many conferences, read papers of your heroes before the conference and impress them with excellent questions. Play on several horses.
6. **Network!** It is useful to have a good network of people to draw upon, those who know you, and who might think of you as a reviewer (well, we all have to slave!), as co-organizer of events, as co-applicants for EU grants or as co-authors. Be strategic about whom you hang out with at conferences. US scholars are generally very effective in utilizing their network. I took a handful of my M.Sc. students to ICIS, and they had read the articles before the conference. As a result, they asked very good questions, so many IS colleagues were impressed with my students. One of those former students who initially went along with me, was Professor Jan Pries-Heje at Roskilde University, who is now following the same strategy.
7. **Make your research topics topical.** Most of our research is, of course, about a certain technology, and they all go through a cycle with invention, diffusion, maturity and retirement. Research opportunities are very different. Compare; e.g.; the Gartner hype curve. The earlier one gets in; e.g.; on new technologies or methodologies like Big Data or Blockchain here in 2017; the higher the chances for publishing one of the first papers on the phenomenon in the high prestige journals and being cited. My paper with Daniel Schlagwein in JAIS in November of 2014 was not the first on crowdsourcing, but I believe it was the first in one of our major journals, and it has been downloaded more than 1000 times. There is the obvious problem that technologies in the early stages on the Gartner curve cannot be studied with very rigorous quantitative methods. I disagree with many of my colleagues, but I would always choose relevance over rigor. There is a lot to be said for revelatory case studies.
8. **Strategize your publication.** Write your PhD thesis as a collection of articles. It is easier to eat an elephant in smaller bites. It is possible to get feedback along the route, and with a bit of luck and a lot of hard work, once you submit your thesis, you already have journal publications. Choosing good co-authors is also vital. As a young researcher with a good idea for a theory expressed in a nice 2x2, I approached Lynne Markus. She was also a young researcher, but she was much more experienced than I in publishing

in international journals at that time. I proposed that we wrote an article based on my theorizing and drawing on her extensive work and knowledge of literature within EDP and power. She had one condition: "Since you have tenure and I have not, I should be first author." I accepted on the condition that she would write the majority, and she definitely wrote much better English than I did. It became my most cited paper, (Markus and Bjørn-Andersen 1987). Obviously, there are other ground rules, such as cite papers in the journal to which you are submitting, identify the most relevant senior editor and involve her/him, etc.

9. **Brand yourself.** Whether we like it or not, there is a high level of competition among IS researchers. You should not sneak along the walls at conferences. Do not be afraid to approach senior scholars and propose collaboration. However, be sure to make them understand that you have done the bulk of the work, and all they need to do is to apply their magical touch on what is going to be a seminal paper.
10. **Ensure your research contribution has value.** Today we are all measured on the number of publications, tomorrow it will be citations, and the day after tomorrow, it will be impact. I think there is a lot of evidence pointing in that direction. After all, IS is an applied science, and unless our stakeholders (students, industry and society) perceive us as being relevant, deans will have a hard time to defend and protect us. I am convinced that we shall all be measured on impact, and it will have more than 20% weight. In the future, it will not be enough to write many papers that only our colleagues (our mutual admiration club) will be citing. Taxpayers, industry giving grants and students paying tuition will not accept that their monetary contributions are only being measured in terms of the number of papers and citations. These are notoriously bad proxies for societal value.

10 Conclusion

We have written this paper as an autoethnographical account of Niels Bjørn-Andersen. The main contributions of our paper are that we provide: 1) an insight into the career development of one of the Scandinavian IS pioneers, illustrated with a large number of selected stories, anecdotes and experiences of Niels Bjørn-Andersen, coming from his 47 years as an IS academic; 2) a historic account of some of the key events in the early days of IS and S/T in Scandinavia, especially in the competitive environment of competing IS perspectives in Scandinavia; 3) a report on the experiences and the challenges in creating a new research field such as IS, including some personal and controversial stories that express what was at stake; and 4) a summary of some of Niels's key learnings in the form of ten commandments, hopefully relevant to young and mid-career IS researchers.

Using the four-tier framework of Porra et al. (2014), our epistemology can be characterized as applying a social relativist paradigm, employing a pragmatic/dialectic approach, using a set of methods facilitating induction from stories/anecdotes to abstract meanings, and scrutinizing with a set of concrete techniques relevant to our autoethnographic and historic analysis.

Although the many stories/anecdotes in places might present a rather kaleidoscopic picture or pictures, we hope that the structure of the presentation has thrown light onto the birth, growth and maturity not just of a particular IS researcher but of the IS discipline, in particular in the Scandinavian countries. In this way it can be seen as outlining a path bringing IS research in general and S/T IS research in particular into the glorious future.

Notes

1. UX: User Experience.
2. The Institute of Management Sciences (TIMS) and the Operations Research Society of America (ORSA) were independent in 1985, merging in 1995 to become TIMS-ORSA.
3. EDP: Electronic Data Processing. In Denmark, often Elektronisk Data Behandling (EDB) and in Swedish Automatisk Data Behandling (ADB).
4. C.F. Tietgen was the most famous Danish business tycoon in the late 19th century and the early part of the 20th century. He had an importance to Danish industries equal to the one Nelson Rockefeller had to industries in the US.
5. Torben Agersnap was the founder of the Department of Organization and Industrial Sociology, and also its first professor appointed in 1969. Flemming Agersnap was the younger brother, and was an associate professor at the time, when he was PhD supervisor for Niels.
6. We define 'IS core' very pragmatically as the topics most frequently presented at ICIS and in the Senior Scholar Basket of Eight journals.

References

- Andersen, C., Arentzen, M., and Petersen, A., (1969). *Systembeskrivelse*, København, Gjellerup.
- Andersen, C., Krogh-Jespersen, F., and Petersen, A., (1972). *Syskon: En bog om konstruktion af datamatiske systemer*, København, Gad.
- Angelique, H., Kyle, K., and Taylor, E., (2002). Mentors and muses: New strategies for academic success. *Innovative Higher Education*, (26:3): 195-209.
- Arnberg, B., and Bjørn-Andersen, N., (1984). *Dit arbejde ved terminalen. Tilrettelæggelse af fremtidens arbejdsplads ved terminaler, tekstbehandlingsanlæg og elektroniske arbejdsstationer*, København, Samfundslitteratur.
- Arnold, J., and Clark, M., (2015). Running the penultimate lap of the race: A multimethod analysis of growth, generativity, career orientation, and personality amongst men in mid/late career. *Journal of Occupational and Organizational Psychology*, (89 2): 308-329.
- Auramäki, E., Lehtinen, E., and Lyytinen, K., (1988). A speech-act-based office modeling approach. *ACM Transactions on Information Systems (TOIS)*, (6:2): 126-152.
- Avison, D., Bjørn-Andersen, N., Coakes, E., Davis, G. B., Earl, M. J., Elbanna, A., Fitzgerald, G., Galliers, R. D., Hirschheim, R., Iivari, J., Klein, H. K., Land, F., De Marco, M., Petti-

- grew, A. M., Porra, J., Stahl, B. C., Sørensen, C., Wood, B., and Wood-Harper, T., (2006a). Enid Mumford: a tribute. *Information Systems Journal*, (16:4): 343-382.
- Avison, D., Fitzgerald, G., and Powell, P., (2006b). Editorial. *Information Systems Journal*, (16:4): 315-316.
- Bansler, J., (1989). Systems development research in Scandinavia: three theoretical schools. *Scandinavian Journal of Information Systems*, (1:1): 3-20.
- Bennis, W. G., and O'Toole, J., (2005). How business schools lost their way. *Harvard business review*, (83:5): 96-104.
- Bhatnagar, S. C., and Bjørn-Andersen, N. (eds.), (1990). *Information Technology in Developing Countries: Proceedings of the IFIP TC9/TC8 Working Conference on the Impact of Information Systems on Developing Countries*, Amsterdam, North-Holland Pub. Co.
- Bjørn-Andersen, N. (ed.), (1980). *Human Side of Information Processing*, New York, NY, USA, Elsevier Science Inc.
- Bjørn-Andersen, N. (ed.), (1982). *Information society--for richer, for poorer: selected papers from a conference held at the Selsdon Park Hotel, London, 25-29 January 1982*, (Vol. 2), Amsterdam, North-Holland Pub. Co.
- Bjørn-Andersen, N., (1988). Are 'human factors' human? *The Computer Journal*, (31:5): 386-390.
- Bjørn-Andersen, N., and Borum, F., (1979). Demokratisierung der Gestaltung von informationssystemen. In: *Mensch und Computer - Zu kontroverse über die ökonomischen gesellschaftlichen Auswirkungen der EDV*, H. R. Hansen, K. T. Schroder and H. J. Weihe (eds.), München, R. Oldenburg Verlag.
- Bjørn-Andersen, N., and Davis, G. B. (eds.), (1988). *Information systems assessment: Issues and challenges*, (Vol. 8), Amsterdam, North-Holland Pub. Co.
- Bjørn-Andersen, N., Eason, K., and Robey, D. (eds.), (1986). *Managing computer impact: An international study of management and organizations*, Norwood, NJ, USA, Intellect Books, Ablex Publishing Corp.
- Bjørn-Andersen, N., and Hedberg, B., (1977). Designing information systems in an organizational perspective. *TIMS Studies in the Management Sciences*, (5): 125-142.
- Bjørn-Andersen, N., Hedberg, B., Mercer, D., Mumford, E., and Solé, A. (eds.), (1979). *The impact of systems change in organizations*, Holland, Sijthoff & Noordhoff.
- Bjørn-Andersen, N., and Raymond, B., (2014). The impact of IT over five decades—Towards the Ambient Organization. *Applied ergonomics*, (45:2): 188-197.
- Blumenthal, S. C., (1969). *Management information systems: A framework for planning and development*, Prentice-Hall Englewood Cliffs, NJ.
- Bostrom, R. P., and Heinen, J. S., (1977). MIS problems and failures: a socio-technical perspective, part II: the application of socio-technical theory. *MIS quarterly*, (1:4): 11-28.
- Brandinger, R., (1966). *ADB: automatisk databehandling*, Malmö, Hermods/NKI.
- Brandinger, R., (1968). *Systemrationalisering*, Lund, Studentlitteratur.
- Bubenko, J. J. A., Källhammar, O., Langefors, B., Lundeberg, M., and Sølvberg, A., (1970). *Systemering 70*, Lund, Studentlitteratur. Kbh.: Akademisk Forlag.
- Bullen, C. V., and Rockart, J. F., (1981). A primer on critical success factors. *CISR*, (69:Sloan WP): 1220-1281.
- Bäckström, M., (1973). *Systemarbetets Metodik*, Lund, Studentlitteratur.

- Bødker, S., Kyng, M., Ehn, P., Kammersgaard, J., and Sundblad, Y., (1987). A utopian experience - On design of Powerful Computer-based tools for skilled graphic workers. In: *Computers and democracy-a scandinavian challenge*, G. Bjerknes, P. Ehn and M. Kyng (eds.), London, Gower Publishing Ltd, pp. 251-278.
- Checkland, P., (1981). *Systems thinking, systems practice*, John Wiley & Sons, Chichester.
- Clemmensen, T., Campos, P., Orngreen, R., Pejtersen, A. M., and Wong, W., (2006). *Human Work Interaction Design: Designing for Human Work - The First IFIP TC 13.6 WG Conference: Designing for Human Work, February 13-15, 2006, Madeira, Portugal*, Hamburg, Springer.
- Davenport, T. H., and Short, J. E., (1990). The new industrial engineering: information technology and business process redesign. *Sloan Management Review*, (31:4): 11-27.
- Ehn, P., and Sandberg, A., (1979). Systems development: Critique of ideology and the division of labor in the computer field. In: *Computers dividing man and work*, A. Sandberg (ed.), Malmoe, Sweden, Utbildningsproduktion, pp. 34-46.
- Gibson, D. E., (2004). Role models in career development: New directions for theory and research. *Journal of Vocational Behavior*, (65:1): 134-156.
- Hernández, F., Sancho, J. M., Creus, A., and Montané, A., (2010). Becoming university scholars: Inside professional autoethnographies. *Journal of Research Practice*, (6:1): Article M7.
- Hoos, I. R., (1961). *Automation in the Office*, Public Affairs Press Washington, DC.
- Kawalek, J. P., (2008). *Rethinking Information Systems in Organizations: integrating organizational problem solving*, New York, Routledge.
- Kraemer, K. L., (1969). The evolution of information systems for urban administration. *Public Administration Review*, (29:4): 389-402.
- Krcmar, H., Bjørn-Andersen, N., and O'Callaghan, R. (eds.), (1995). *EDI in Europe: How It Works in Practice* New York, John Wiley & Sons.
- Kumar, K., and Bjørn-Andersen, N., (1990). A cross-cultural comparison of IS designer values. *Communications of the ACM*, (33:5): 528-538.
- Kyng, M., and Mathiassen, L., (1982). Systems development and trade union activities. In: *Information Society for Richer for Poorer*, N. Bjørn-Andersen (ed.), Amsterdam, North-Holland.
- Lanamäki, A., (2015). A Consideration for Researcher Career Retrospectives in Information Systems and Organization Studies. In: *Nordic Contributions in IS Research: 6th Scandinavian Conference on Information Systems, SCIS 2015*, H. Oinas-Kukkonen, N. Iivari, K. Kuutti, A. Öörni and M. Rajanen (eds.), Oulu, Finland, Springer, pp. 77-91.
- Langefors, B., (1966). *Theoretical analysis of information systems (THAIS)*, Lund, Studentlitteratur.
- Langefors, B., (1968). *System för företagsstyrning*, Lund, Studentlitteratur.
- Lave, J., and Wenger, E., (1991). *Situated learning: Legitimate peripheral participation*, Cambridge, UK, Cambridge university press.
- Learmonth, M., and Humphreys, M., (2012). Autoethnography and academic identity: glimpsing business school doppelgängers. *Organization*, (19:1): 99-117.
- Leavitts, H. J., (1964). Applied Organisation Change in Industry: Structural, Technical and Human Approaches. In: *New Perspectives in Organisational Research*, W. W. Cooper, H. J. Leavitt and M. W. Shelly (eds.), New York, John Wiley.

- Leonardi, P. M., (2013). Theoretical foundations for the study of sociomateriality. *Information and Organization*, (23:2): 59-76.
- Lewin, K., (1945). The research center for group dynamics at Massachusetts Institute of Technology. *Sociometry*, (8:2): 126-136.
- Lindblom, C. E., (1959). The science of “muddling through”. *Public Administration Review*, (19:2): 79-88.
- Lindholm, J. A., (2004). Pathways to the professoriate: The role of self, others, and environment in shaping academic career aspirations. *The Journal of Higher Education*, (75:6): 603-635.
- Lundeberg, M., (1982). The ISAC approach to specification of information systems and its application to the organization of an IFIP working conference. In: *Information systems design methodologies: A comparative review*, T. Olle, H. Sol and A. Verrijn-Stuart (eds.), The Netherlands: North-Holland, pp. 173-234.
- March, J. G., and Simon, H. A., (1958). *Organizations*, Oxford, England, Wiley.
- Markus, M. L., and Bjørn-Andersen, N., (1987). Power over users: its exercise by system professionals. *Communications of the ACM*, (30:6): 498-504.
- Morton, M. S. S., (1971). *Management Decision Systems - Computer-Based Support for Decision Making*, Boston, Division of Research, Graduate School of Business Administration, Harvard University.
- Mumford, E., (1996). *Ethics Tools for Ethical Change*, London: Macmillan.
- Mumford, E., (2006). The story of socio-technical design: Reflections on its successes, failures and potential. *Information Systems Journal*, (16:4): 317-342.
- Mumford, E., Hirschheim, R., Fitzgerald, G., and Wood-Harper, A., (1985). *Research methods in information systems*, North-Holland Publishing Co.
- Mumford, E., and Ward, T. B., (1968). *Computers: Planning for people*, Batsford.
- Mumford, E., and Weir, M., (1979). *Computer systems in work design: The ETHICS method*, New York, John Wiley.
- Nocera, J. A., Barricelli, B. R., Lopes, A., Campos, P., and Clemmensen, T., (2015). *Human Work Interaction Design. Work Analysis and Interaction Design Methods for Pervasive and Smart Workplaces - The 4th IFIP 13.6 Working Conference, HWID 2015, London, UK, June 25-26, 2015, Revised Selected Papers*, Hamburg, Springer.
- Nygaard, K., and Terje Berge, O., (1975). The trade unions-New users of research. *Personnel Review*, (4:2): 5-10.
- Orlikowski, W. J., (2007). Sociomaterial practices: Exploring technology at work. *Organization studies*, (28:9): 1435-1448.
- Orlikowski, W. J., (2010). The sociomateriality of organisational life: considering technology in management research. *Cambridge Journal of Economics*, (34:1): 125-141.
- Orlikowski, W. J., and Scott, S. V., (2008). 10 sociomateriality: challenging the separation of technology, work and organization. *The academy of management annals*, (2:1): 433-474.
- Porra, J., Hirschheim, R., and Parks, M. S., (2014). The historical research method and information systems research. *Journal of the Association for Information Systems*, (15:9): 536-576.
- Robey, D., Anderson, C., and Raymond, B., (2013). Information technology, materiality, and organizational change: A professional odyssey. *Journal of the Association for Information Systems*, (14:7): 379-398.

- Sandberg, A. (ed.), (1979). *Computers dividing man and work—Recent Scandinavian Research on Planning and Computers from a Trade Union Perspective*, (Vol. 13), Malmö, Sweden, Arbetslivscentrum (Swedish Center for Working Life).
- Schlagwein, D., and Bjørn-Andersen, N., (2014). Organizational learning with crowdsourcing: The revelatory case of LEGO. *Journal of the Association for Information Systems*, (15:11): 754 - 778.
- Schubert, P., Kilian, T., and Bjørn-Andersen, N., (2014). “I am an Engaged Scholar”: a typology of IS researchers’ engagement in research with industry. *Procedia Technology*, (16): 138-149.
- Simon, H. A., (1949). *Administrative Behavior. A Study of Decision-making Processes in Administrative Organisation.*, New York, Macmillan Company.
- Sjöberg, S., (1969). Vilka skall ha terminaler? *Modern Datateknik*:5): 49-50.
- Taylor, F. W., (1911). *The principles of scientific management*, New York and London, Harper.
- Van Maanen, J., (2015). The present of things past: ethnography and career studies. *Human Relations*, (68:1): 35-53.
- Veletsianos, G., (2013). Open practices and identity: Evidence from researchers and educators’ social media participation. *British Journal of Educational Technology*, (44:4): 639-651.
- Wood-Harper, A. T., Antill, L., and Avison, D. E., (1985). *Information systems definition: the Multiview approach*, Blackwell Scientific Publications, Ltd. Oxford, UK.