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ABSTRACT

This brief article provides a short overview of the evolution and status of information systems in Nordic countries. Here, by Nordic countries I mean what is normally called Scandinavia (Denmark, Norway and Sweden) and the Fenno-Scandia (Finland), and a few Northern islands (especially Iceland, Faroe Islands, Greenland). This area is linguistically and geographically dispersed and huge by European standards, but has a small population (c.a. 25 million). Yet, it is normally regarded as a homogeneous socio-economic area, which is characterized by high standards (and quality) of living with highly advanced welfare states. It also enjoys a unifying political agency through the Nordic Council, and has had shared labour markets and equal social benefits among its citizens since the early 50's.

Key-words: IS community, Nordic countries.

RÉSUMÉ

Ce court article donne une vision rapide de l'évolution et du statut de la spécialité des systèmes d'information dans les pays nordiques, c'est-à-dire la scandinavie (Danemark, Norvège et Suède), la Finlande et les Îles nordiques (Islande, Îles Feroe, Groenland). Cet espace est linguistiquement et géographiquement dispersé et immense par rapport à l'Europe, mais sa population est faible (25 millions d'habitants) Cependant on le perçoit comme homogène socio-économiquement, caractérisé par un niveau et une qualité de vie élevée, avec des États modernes et protecteurs. Il profite aussi d'une organisation politique à travers le Conseil Nordique, d'un marché commun du travail et offre une couverture sociale égale à tous les citoyens depuis le début des années 50.

Mots-clés : Communauté SI, Pays nordiques.

Nordic countries portray currently an advanced technological infrastructure that is unmatched by any other part of the globe as evidenced by such figures as phones per capita, mobile phones per capita, or Internet users among 1000 inhabitants. Therefore, many regard Nordic countries as the most advanced information societies in the world. Nordic countries have also been very active in shaping the visions of the future Information societies through the political processes at the national level. Each country (save Norway) has published their own high level political program for building a Nordic model of the "Information society", which engages large civic participation by using networks, offers opportunities also for the poor, and enables more harmonious regional development.

This report is my personal interpretation of the Nordic IS 'stage' which I hope will illuminate some of the specific features of the Nordic IS research community to French readers. I will cover in my report both research and teaching, but my emphasis will be on research. Before embarking on the subject three caveats are in order. First, it is quite difficult to obtain a general overview of the size and evolution of the Nordic IS community as it is dispersed over four (five) different countries that are governed by separate governments, regulations and educational systems, and two quite different groups of languages (Scandinavian languages i.e. Swedish, Norwegian and Danish, and Fenno-Ugrian languages i.e. Finnish and Same). Second, like in many European countries the IS community in Scandinavia is divided between business schools and computer science departments. In Nordic countries the computer science part is in terms of the size and volume clearly a dominating group. This makes comparisons, and also collaboration between departments within each country and within the region sometimes difficult. Third, this is not the first analysis of Nordic IS research. More keen readers are invited to examine my article with Iivari (1999), which examined the evolution of systems development research in Scandinavia over the last 30 years. Related analyses can also be found from Bubenko (1992), Bjerknes and Bratteteig (1995) and Bansler (1989). A good overview of changes in research topics in IRIS conferences (see below) has been reported by Nurminen (see the web site at http://www2.cs.utu.fi/IRIS/iris.htm).

Teaching in IS area started in Scandinavia relatively early. The first computing chair was established in Tampere University in 1965. Several other universities followed in the next few years (including Oslo University, and University of Stockholm). Teaching in IS related topics including systems design and analysis and operations research problems started nearly at the same time. Since then the scope and scale of teaching has expanded considerably and it is difficult to find any university save some specialized institutes like in Music or Veterinary science, which do not offer some IS courses. The number of active IS departments or separate IS groups in Scandinavia is c.a. 35-40 depending on the criteria we use to define them. The largest groups can be found among others in Copenhagen Business School (Denmark), Aarhus

University (Denmark), Oslo University (Norway), Norwegian University of Science and Technology (Norway), Gothenburg University (Sweden), Stockholm University (Sweden), University of Linköping (Sweden), University of Jyväskylä (Finland), Oulu University (Finland), and Turku University (Finland). All these are strong in research as well as in teaching. Strong managerially focused research groups can also be found in Helsinki School of Economics (Finland), Stockholm School of Economics (Sweden) and Norwegian School of Management (Norway).

IS related teaching in Scandinavia has its roots in systems development and systems analysis. The teaching core has been expanded considerably over the years into areas like data bases, HCI, knowledge management, IT strategy, CSCW, IS management, economics of information, and software engineering including CMM, software engineering tools etc. There are no formal regulations or even coordination across departments in IS education and there is no "Scandinavian IS Education Program". Many departments have however, traditionally shared models and experiences in IS education. One coordinating mechanism has also been the exchange of students and faculty between different IS departments which has been supported both by the Nordic Council and EU.

Systems development has traditionally dominated also the research. Here we can recognize many pioneering contributions of the Scandinavian research community in areas like participative design, high level requirements and modelling, systems analysis, organizational impacts and implementation of IT. Scandinavians also started this early. The first IS related article in Scandinavia was published in 1963 (Langefors, 1963). The article outlined a research programme on infology and made its creator Börje Langefors one of the great pioneers in the IS field. He was the first person also to coin the term information systems for the field in the IFIP world conference in 1965 (Lundeberg, 1999). His research was supplemented by several other first wave pioneers including: Kristen Nygaard (father of Simula and object oriented programming, but also the creator of the trade union focused systems development), Mats Lundeberg (developer of the ISAC method and the creator of change focused approaches to IT adoption), Janis Bubenko and Arne Sölvberg (creators of one of the first CASE tools and active participants in the development of conceptual modelling approaches), Nils Björn-Andersen (introduced sociotechnical design ideas into systems development in Scandinavia), and Pentti Kerola and Pertti Järvinen (developed first spiral and contingency focused process models for systems development in the world through their PSC model in the early 70's).

Due to this early start the IS community has been relatively firmly established in Scandinavia since the mid 70's. In consequence, the world's oldest continuous IS research seminar was started in 1978 which was first called Scandinavian Research Seminar on Systems Development models, but later adopted its current name called IRIS (Information Systems Research in

Scandinavia; see http://iris.informatik.gu.se/conference/). The IRIS conference is organized in mid-August every year on a rotating basis in that the conference circulates among the four largest Nordic countries. Currently, the conference draws together c.a. 150 participants every year. To participate one has to submit always a paper or other type of submission (workshop, panel). The conference promotes free exchange of research ideas on chosen research topics. In particular, it enables younger researchers to present their research to a larger scientific audience. It applies a "soft" review of submitted papers and seeks to improve the quality of all the papers submitted to the conference. The conference includes two invited speeches by senior faculty in Scandinavia, and features invited presentations by eminent scholars outside Scandinavia. The working language of the seminar has been since its inception English, which also makes easier for non-Scandinavian researchers to participate.

The IRIS seminar has later become a grounding place for establishing a formal society for the Scandinavian IS research community – also called IRIS (see http://iris.informatik.gu.se/). The society was established in 1997. The establishment of the association was a reaction to the needs of having a long term strategic approach to the development of IS community in Scandinavia, to strengthen its research quality and visibility, and to increase awareness and visibility of the Scandinavian research community. Originally there were also some plans to increase support of IS related research topics at the Scandinavian level (Nordic Research council), but so far this has not been successful. The society is "a non-profit organization aiming to promote research and research education in the use, development and management of information systems in Scandinavia, and making that research known in the international research community and among practitioners."

IRIS has currently c.a. 200 members and c.a. 20 institutional members. All paid participants of the IRIS conference become automatically members of the IRIS association. The association is run by a steering committee, which has representatives from all Nordic countries. It is selected yearly in an IRIS meeting at the conference. A main activity of the IRIS association has been to publish a journal titled Scandinavian Journal of Information Systems (see http://iris.informatik.gu.se/sjis/). The journal was established in 1989 and since the mid 90's it has published two issues per year. The journal seeks to promote research on topics which relate to Scandinavian research themes (participation, organizational impacts, systems development, modelling, CSCW etc), but its authors are not necessarily always from Scandinavia. The journal applies double-blind reviewing standards, and has often published research whose quality matches that of any high quality IS research outlet. Therefore it has received over the years submissions from all over the world and has featured articles written by many leading IS scholars. The subscription fee for the journal is quite low (300 SKR / year; 600 SKR for institutions) and it offers a good window for research results and activities in Scandinavia. An intriguing and nice feature of

the journal has been that it has been much more polemic and critical in its research orientation than other journals in the field.

The size of the IS community has grown considerably during the 80's and the 90's. There are no formal surveys of the size of the community or the number of PhD students in the field, but a rough calculation suggests that the number of IS researchers (in IS related topics) is anywhere from 500 to 1000 depending how freely we define the area. One increasing factor for the size is that both Ericsson and Nokia have large R&D activities in Scandinavian countries, which increases the number of researchers in areas like software process improvement, requirements management, software quality, or HCI just to name a few. The number of active PhD students is currently c.a. 300, which in terms of the size of the countries probably is one of the highest per 1000 people.

IS research in Scandinavia is quite varied in terms of topics, research approaches, or theory basis. They cover most of the "core" IS areas like IS development, databases, software tools and engineering environments, personal computing, e-business, organizational impacts and organizational change, IT strategy and IS management, economic aspects of IT use and impact, or the impact of IT on work and future organizations. Scandinavian research offers also a healthy mix of constructive, empirical and theoretical research. One atypical feature is probably that positivistic research, which normally reigns in the rest of the world, in Scandinavia counts as a minority. Typical for Scandinavian IS research is probably also a higher proportion of constructive research when compared with the profile of the UK or US based IS research. Scandinavian scholars seem to share also an unusual appetite, tolerance or enthusiasm over philosophical or conceptual issues in IS research. Therefore, over the years Scandinavian researchers have been forerunners in engaging in hermeneutics, action research, ethnography, critical theory, speech act theory, structuration theory, actor-network theory, gender issues or Marxist strands of IS research.

The research climates have been traditionally similar in all Scandinavian countries, because their university and educational systems have many similarities. During the 90's this has changed. Especially in Sweden and Finland the impact of Ericsson and Nokia, respectively, in providing research opportunities and in shaping government funding has been considerable. These two countries have currently the largest portion of their GDP allocated to research (in Sweden over 4% and in Finland 3.5%) in which c.a. 1.5% can be attributed to the effects of these two companies in both countries. This has resulted in a situation where research funding for issues like software development, software architectures, new product innovations, mobility (i.e m-business), or human-computer interaction has been abundant. This has considerably shaped the research agenda of IS researchers in these countries and created in some places large R&D focused research institutes in universities (e.g. Victoria Institute in Gothenberg), which collaborate with these companies or their clients (like Telia,

Sonera etc). At the same time both Swedish and Finnish governments have launched separate IT focused research programs, which have been at the same time matched with considerable Pan European EU research programs. This has not been the case to the same extent in Denmark and especially in Norway. Therefore, one can observe that the pace, focus and extent of IS research has differentiated in the late 90's among Scandinavian countries. To what extent the recent downturn in the telecommunication sector and poorer results and scant growth of both Ericsson and Nokia will change this remains to be seen.

It is quite likely that the "Golden Era" of Scandinavian IS research is over as the heterogeneity in other parts of the world in IS research is increasing and the "free wheeling" atmosphere of Scandinavian IS research is also accepted in other parts of the world. Most typical Scandinavian topics like participation, democracy, high level modelling, integration of work and IT service are being actively studied in all parts of the world so it is very difficult to pinpoint any theory, approach or idea which is any more typically "Scandinavian". Despite this the future for IS research in Scandinavia is filled with optimism. Its IS community is well established, it is one of the oldest in the world, and it carries a unique and proud heritage. The environment also favours IS research because the organizations have learned over the past two decades to utilize IT and to cooperate with the universities, its work force is well educated and the countries enjoy the presence of some of the best and strongest IT companies in Europe which is backed by strong political will to push the societies well into the 21st century. The opportunity can only be missed by a lack of enthusiasm and intellectual leadership within the IS community.

REFERENCES

Bansler, J. (1989), « Systems development research in Scandinavia: Three theoretical schools », *Scandinavian Journal of Information Systems*, Vol. 1, p. 3-20.

Bjerknes, G. and Bratteteig, T. (1995), « User participation and democracy: A discussion of Scandinavian research on system development », *Scandinavian Journal of Information Systems*, Vol. 7, n°1, p. 73-98.

Bubenko, J.A. Jr. (1992), « On the evolution of information systems modelling – A Scandinavian perspective », in Lyytinen, K. and Puuronen, S. (eds.), *Computing in the Past, Present and Future*, Department of Computer Science and Information Systems, University of Jyväskylä, Jyväskylä, p. 31-65.

Iivari J., Lyytinen, K. (1999), « Research on Information Systems Development in Scandinavia – Unity in Plurality », *Scandinavian Journal of Information Systems*, Vol. 10, n°1-2, p. 135-185.

Langefors, B. (1993), « Some approaches to the theory of information systems », *BIT*, Bind 3, Hefte 4, p. 229-254.

Lundeberg, M. (1999), Personal Communication, Charlotte, 12-13.12.