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"SNC – When the red nose won't do!" A nomadic proposition for connectivity

Luleå University of Technology (LTU) is situated in the northernmost region of Sweden, and has commission to serve the development of the region as well as taking part in the national research and higher education agenda. In June 2001, a Sámi women's business development and gender equality project concerned mainly with the development of reindeer herding as the Sámi people's traditional source of living, invited LTU to co-operate in their development activities. This lead to an advanced proposition on how to provide connectivity for communication challenged areas; Sámi Network Connectivity (SNC). The SNC objective is to provide connectivity where other sources are not available, while making the local population part of the development of the technical system, both women and men included.

Project context

Reindeer herding with its subsidiaries has an ancient history in northern Fenno-Scandia, where it is coupled to the indigenous population of Scandinavia: the Sámi. Sápmi is the Sámi word for the land where Sámi traditionally live and to which Sámi culture is coupled. This land encompasses northern Norway, Sweden and Finland (30-45 % of the respective countries) together with the Kola Peninsula (Northwest Russia), with a total of up to 800,000 herded reindeer.[1] Reindeer herding and nomadism are coupled together, as the herds benefit from grazing different pasture grounds throughout the year. Today, national legislation, unique to each country, controls the way reindeer herding is organised. In Sweden the right to herd reindeer rests upon the conditions of being Sámi and having

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[1] Figures are collected from *Svensk rennäring* (1999). For an introduction to Sámi people and culture, see e.g. Haetta (1993).

membership in a Sámi Village. The Sámi Villages[2] are juridical entities established by the Swedish State as possessors of rights to use land and water for reindeer pasture and subsidiary livelihood from activities such as fishing and hunting. However, even though the Sámi Villages possess the rights, herding is not communal, but organized in private enterprises. In Sweden, reindeer herding is predominantly run as micro size enterprises with the owner as major work force and with none or temporary employees. As business leadership is basically the same as the main workforce in a herding enterprise, conditions of work and conditions of business development and economy are intertwined. The business is gendered, so that a majority of the reindeer enterprise leaders are men, and the largest herd owners are men. The Swedish average counts one woman business leader out of eight reindeer herding companies (Kråik 2002). To fully appreciate the range of this gendered structure, one must include, that as national legislation has coupled herding business leadership to Sámi rights, this gendered structure of herding business has effects of significance among the Sámi beyond the scope of business itself.[3]

The first step towards the evolvement of the SNC proposition was taken in Sirges, one of the Sámi Villages in Sweden, through the formation of the project *Kvinna i sameby* (KIS) in October 2001. (English: Woman in a Sámi Village.) The KIS aims were to stimulate the economic growth of Sirges, build business capacity among the village's women, especially within reindeer herding, and achieving larger influence for Sirges' women in grazing land management and other communal matters. Sirges counts approximately 500 members, which makes it the largest Sámi Village in Sweden. Major parts of the Sirges area lies within *Laponia*, a 9 400 km^2 protected area listed by UNESCO as World Heritage. Administrative centre of the area resided by the Sirges herders and neighbour Sámi Villages is the little town Jokkmokk, known for its annual winter trade fair. Population density is 0,33 inhabitants per square kilometre. Apart from reindeer herding, primarily hydro power production and timber logging provides the industry employment in the area.

Already in the planning of the KIS project, researchers specialised in gender and technology studies at the regional university, Luleå University of Technology, were contacted so as to integrate scientific assistance from the early stage. Social and technical conditions for work and business development were in focus, and an associated but separately funded university project was formed, NMKR[4]. When planning this co-operation, it was obvious that including technical assistance of any kind – from problem analysis, investigation of solution spaces, to construction, testing etc. – would take in a quality of action research to the partnership. When LTU was established in 1971, it got a commission from the Swedish government to serve as motor for the development of the northernmost regions of Sweden (Lane 1983). However, the activities that were appointed as target areas were mining, heavy industry and timber industry. Locally owned industries such as reindeer herding were not included in the government's original appointment, the same goes for sectors that in this region predominantly employ women, such as the health care and service sectors. (Udén 2000a, 2000b, 2002). As a result, patterns for co-operation with such as a Sámi women's initiative to develop reindeer herding are not established at LTU, and it could not be foreseen what response further requests to the

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[2] Another term sometimes used is *Grazing Community*. Sámi Village is a direct translation from the Swedish term *Sameby*,

[3] See e.g. Amft (2000), Joks (2001), Kråik (2002).

[4] *Nya möjligheter för kvinnor i renskötselföretag*, funded by Vinnova and EU Mål 1 Sápmi Norra. (English: New possibilities for women in reindeer herding.)

university, developed during the process, would awake within the organisation. As the patterns of contacts at LTU are not unique, but mirrors general Swedish and regional practices of structuring technical research and development (see e.g. Berner 1999, Lindberg 2002, Mellström 1995, 1997), the unforeseeable situation was the same regarding contacts with the technical sector in general, including private enterprises of any scale and technical research bodies.

An information society for all

In Sweden, one of the Scandinavian welfare states, the policy is that information technology shall be "for all". The significance attributed to this technology is demonstrated by the fact that it has become customary to assign it a government proposition of its own. In the foreword to the English comment of proposition 1999/2000:86, *An Information Society for all – a publication about the Swedish IT policy,* the Minister of Industry, Employment and Communications stated that:

> *Today, we are in a period of tremendous change, as we stand on the threshold to information society.*

The main line of analysis, which the Minister acknowledged, was the following (selected quotes put together from 1999/2000:86):

IT represents a new base technology comparable to e.g. electricity. It is characterised by speed and interaction, and it is limitless. It is changing methods in business, government and municipalities, and has been a major factor in developing businesses and making them more competitive. The rapid rise of the IT sector, however, inhabits a risk for creating a gap between those who have and who have not real access to this technology. The most important task (today) is to ensure that everyone will benefit. IT allows both men and women to realise their creativity and develop new skills. We must learn about – and master – the new tools, irrespective of gender, age, place of residence or profession. This contributes to the general quality of life, strengthening democracy, and enhancing Sweden's competitiveness. The Governments task is to ensure that IT functions as a catalyst for progress, and the available measures are encouraging increased skills, improving accessibility and taking steps to enhance user's confidence in the new technology.

The proposition formulates a relation between Swedish citizens and information technology which, on the behalf of the population, is based on the duality of *the right to equal access* and *the obligation to develop IT skills*. IT in return offers competitiveness, realisation of potentials and improved quality of life. The object of the proposition is labelled IT – information technology. An idea of an "information society" with certain qualities is closely linked to this term. The Minister's foreword does include one of the keywords of the information society discourse: *limitless*. Information technology is limitless, the Minister of Industry, Employment and Communications states, and, the free flow of information is practically unlimited.

 IT has, however, not been able to fulfil that which was expected. Equal access is not established. Sparsely populated and remote areas in Sweden are found "on the other side" of the digital divide, amongst the "have-nots". If the concept is changed from IT to ICT – information and communication technology – we may in short witness reverse development. Presently, people in remote areas of Sweden experience a threat of decreasing access to communication systems, as compared to the last decades. The

newer mobile telephone systems presently being built are less ready for deployment in sparsely populated regions than the system which they replace, and unfortunately the system 'upgrade' includes removal of the more capable legacy system. In the case of sparely populated regions, the basic criteria of any new system, that it be at least as functional as its predecessor, was not a strong concern in the national level decision making in the first years of the 2000's. However, after amongst others the Federation of Swedish Farmers (LRF), the Swedish Sámi Parliament, timber industry organizations and forestry trade unions have put emphasis into informing the government about economic and other consequences to the industries and populations they represent, a certain revaluation may be coming. (Press reports e.g. in Skogsland 2003)

The Sámi Network Connectivity: proposition and project

Today, the snow mobile is the crucial tool for the individual reindeer herders, in their daily work. The snow mobile is also popularly regarded, as a main reason why women have difficulties being active as herders; the supposed reasons being its heavy weight and its "technical" character.[5] Thus, the early start of KIS-NMKR co-operation came to focus on the snow mobile. Yet, the significance of information and communication technology was evident, both of material and strategic reasons. A centre that hosts coalition projects between LTU and the ICT industry, Center for Distance Spanning Technology (CDT), was chosen for the first attempt to create contact with an ICT environment. The response was positive. The CDT CEO traveled to Jokkmokk together with a co-worker for a meeting with KIS and other possible partners for future projects. Nevertheless, it was probably unexpected for all parts involved when a proposition for building connectivity was provided by an American guest researcher at the Department of Mathematics and Systems Technology. The surprise lay in the magnitude of the response: not for some singular gadget, but for a system which would provide Internet connectivity in a totally new manner. But not least the amazement lay in the fact that a senior international Internet specialist took as much interest in the request for co-operating with the Sámi women. Within KIS, the proposition was embraced both as it offered the possibility to develop sought after business applications for use in reindeer herding, and because of the general benefits use of the Internet can offer, including social and leisure aspects. The women in KIS also saw that their position in the herding community would be considerably strengthened by having a role in high-tech development, and hoped this could serve as model for how women's capacity and role in the Sámi Villages was to be judged in the future. From May 2002, a group of four women with different ethnic, educational and professional background – two reindeer herders, one gender studies researcher and one Internet specialist – came to jointly work for establishing and carrying SNC through. An important back-up at local level was found among the leadership and staff of the Sámi Educational Center in Jokkmokk, which is owner of an Internet portal popular among Sámi, the Same Net (www.same.net). Sámi Network Connectivity (SNC) was established as working title for the connectivity project and has remained. Fundamental to the strategies, developed by the group to further the project, has been that all parts from start were in tune regarding the basic idea of how SNC should be built up. All agreed that the effects of SNC to the local community depended on more than providing a solution. An explicit aim was to create and maintain a

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[5] Eikjok (1989), Udén (2002).

local project ownership, and to locate as much as possible of the technical and other development activities to the Jokkmokk area. From the start, SNC was both a technical proposition for how to provide connectivity and a project to make the development of this new technology an example of user involvement, technology transfer and local ownership of problem solutions. As the SNC proposition was accepted by the KIS project workers, phase 0 was started – development of the architecture and high level design, production of project plans and fund raising.

The SNC technical proposition

As technical design, Sámi Network Connectivity (SNC) is produced to establish connectivity for the population of reindeer herding families in the Jokkmokk - Laponia area in Sweden's northernmost county Norrbotten. Currently, reliable wired, wireless or satellite communication capabilities are not available in major parts of the areas within which the Sirges herders and their families work and stay, or would prefer to stay if possible (satellite communications are largely unavailable because of its cost). A solution to serve Sirges and Laponia has to address topographic circumstances (much mountain terrain), the fact that Laponia is protected and should be preserved (which puts constrains on installing fixed infrastructure like antenna towers) and the semi-nomadic nature of reindeer herding. A solution must also be accessible at an affordable and maintainable cost. (It should be noted that this "lack of connectivity" is not unique, but chiefly the same in all reindeer herding areas in Scandinavian and Russian parts of Sápmi.) The SNC approach to meet these requirements is based on the concept of Delay Tolerant Networks, in an Opportunistic Routing system using a mix of 802.11 hotspots and mobile relays. The technical proposition is rather simple in its most basic terms, yet its deployment will not be quite so simple. It relies on the opportunistic idea that where communications infrastructure exists it should be used. And where is doesn't, or can't, exist then mobile relays can be used along the same travel paths that the semi-nomadic communities use in their daily lives. These mobile relays are mounted in the vehicles the people drive and can even by carried in backpacks to reach areas not served by roads. The communities send out email and requests for web content and have that content delivered. In many cases the web content delivery can be prearranged, for example lesson plans or the daily newspaper. In essence just as the postman delivers letters and magazines to a community, so too the mobile relays bring content to remote communities. The routing scheme allows this delivery to extend beyond a single community as the bundles of content can be transferred between relays and to gateway repositories where the content bundles can later be transferred to other relay carriers whose destination matches the intended recipient. To repeat: the principal solution is building a Delay Tolerant Network, which is an Internet technology in its very initial stages of development. To carry the construction process out from architecture to system touches on several technical areas, some of which still require research while others require innovative application of existing technology. The core is prioritizing robust connectivity, while real-time speed will not be provided initially. SNC would, as envisioned by the SNC group, initially provide email, cached web access, reindeer herd tracking telemetry, and basic file and data transfer services through the appliance of ad-hoc and delay tolerant network principles.

SNC process: initiation and phase 0

The process of SNC to date, can be described in five stages, not entirely separated in time but nevertheless quite possible to present as a time series. The first stage was a contact stage, where the computer science environment at LTU, the "home" university, was approached via CDT. The first response was positive and uncomplicated: a meeting was arranged to explore where a contact might lead. As result, a guest researcher came to hear about the request for development co-operation, got interested enough to focus on the problem and responded a month later with the radical connectivity proposition. Next step was an acceptance stage where the proposition was first presented to the LTU project staff, next to the KIS project leaders. After both these parts had decided to accept the suggestion, which happened within a couple of months from the first exploratory meeting with CDT, "phase 0" started. With the SNC proposition, the local women and the gender studies environment at LTU were presented with a dream situation, having a powerful instrument of change within reach. The first stage of phase 0 can be described as the "home university stage". It was natural to continue seeking alliance with the computer science environments of LTU. However, the response grew increasingly vague. Apparently, the SNC group did not gain approval at high enough levels. At least it was not possible to anchor SNC's further development solely at LTU; this was obvious at about six months after phase 0 started. The SNC originator's year as guest researcher in Luleå ended with December 2002, which meant that the key technical person for the project was no longer present in the local LTU computer science environment. As it had become evident to the local women that LTU would not serve as enough support, they revaluated their own position and became more active in trying out their possibilities to further the project. Next stage became a search stage, where different strategies and possible partnerships were investigated from both KIS as local part and future users, and from NMKR as being university based gender and technology project. This six months stage was straining to the involved individuals. The project had gotten into a situation of receiving a number of suggestions about technology choices (a sign of "being interesting"), and some attractive offers for co-operation. Part of this situation of catching interest stemmed from a paper presented at a conference in Bangalore (Doria *et al* 2002). (This presentation had an interesting setting in itself: based on information available on Internet, an Indian computer science student got interested in making a presentation of SNC at the conference.) But SNC still had no platform of its own to co-operate from. The SNC group came to feel the process had fallen into a negative loop that could be difficult to get out of.

The best ways to get around road blocks, the group decided, was to keep on explaining what SNC is all about, and to keep on searching for partners and affiliations. To explain SNC is never just a matter of explaining a technical idea. At each step of the process, it is necessary to explain its social relevance, importance and appropriateness. And given the origins of the project, this is probably appropriate and, in fact, pedagogically useful. Yet, it takes a very motivated and well functioning team to be able to answer to these requests of pedagogical skills; and so does constantly searching new partners and new possibilities for funding. Eventually, the loop was tied up from two sides at the same time, in that the needed complimentary university based contacts were established with computer science environments at two Swedish universities other than LTU, and the local agents found an experienced partner for small business development in rural areas (Hushållningssällskapet i Norrbotten, www.hush.se/bd). The strategy came to be double; acting both from KIS/locally and NMKR/university environment. Possible funding was identified for development of the connectivity proposition on the one hand, giving this a genuine local context on the other. A stage of applications development started. Within

the next couple of months (at the moment of writing) it will show how well the efforts of this stage have succeeded.

Some process experiences

At the moment of writing, SNC has been in the developing stages of phase 0 for the past eighteen months. Perhaps we will soon get the support that allows us to enter phase 1. Being a high tech proposition Sámi Network Connectivity emerged from an unexpected setting: a local women's initiative. An eighteen months time span from idea to project initiation can be judged as acceptable indeed, especially for a project that includes not only new technology but the formation of novel connections between technical researchers and society. Yet, the technical solution as well as the project addresses several less favorable positions and structural dilemma within "the information society": rural communities, remote and sparsely populated areas, gender divides – also ethnic divides within the Swedish nation. Thus, it is inevitable to reflect upon these eighteen months as a sign of poor preparation within the Swedish society to meet the possibility to take action for change given through SNC. Had it not been for the determination of the involved individuals, the process would have stopped long ago and there is no security as to that this will not finally happen in short. There might be some experiences gained already from the SNC formation phases, however, that irrespectively of the final success of SNC, are of interest to describe and discuss.

Originally, the SNC project came through because individuals took unconventional initiatives within existing resources. The KIS project gave space for women reindeer herders to elaborate some ideas upon their Sámi Village's and their own future. The NMKR project gave a university based platform for identifying potentials and initiating contacts, and the 2002 guest research position at LTU was the SNC originator's platform for launching the proposition. However, those "existing" resources have an end. At the moment of writing, the available spaces are closing; KIS ended with September 2003, NMKR ends with December of the same year. After it became clear that the LTU environment which once was the project's "greenhouse" would not give the full assistance to actually plant it, it has been an urgent matter to establish new unions with organizations that are considered legitimate for high tech ICT research and development. Especially one problem occurred when arriving at the "search stage": as possible partners and funding sources at national and regional level were approached by NMKR, it gradually showed to be a recurring answer, to refer to the LTU computer science environment as the appropriate organ for channeling resources. It was seen as the organ through which ICT research funding could be applied for, when applying from the Norrbotten region. But this assigned organ was the very same as at that stage functioned poorly for furthering the SNC plans. Key persons rejected it at certain parts and at critical points neglected to communicate. Thus, the situation became desperate. At the same time, the "local" KIS strategy faced the same type of problem: those individuals and organs that became interested in the project when approached, judged it as "not their jurisdiction" and passed on to other organs and individuals in "right" positions, in this case civil servants and elected chair persons at regional and local levels. Unfortunately these appointed persons turned out to be explicitly negative or simply did not answer back when approached by KIS. This was the negative loop of the search stage.

Yet, the process of phase 0 has in no moment been one-sided. This is a very distinct experience. First and foremost, a PhD student in computer science at Luleå University of

technology got interested in one of the key problems that the SNC proposition presented (namely that of routing intermittently connected networks with probabilistic configuration). After one year the results of his work are one poster presentation at an international conference and one chapter in the PhD student's licentiate thesis (Lindgren et al 2003a,b). These results reinforce the scientific credibility of the project and are thus valuable not only for bringing the connectivity problem closer to its solution but also to strengthen the whole SNC team's possibilities to find allies, especially within scientific circles. Also, an LTU professor of a needed complimentary science subject joined SNC in a stabile manner already at the stage when the "home university" scenario was still unchallenged, and he remained after this had to be revaluated. This gave not only scientific expertise needed, but also connection within a "legitimate" subject for ICT development at the regional university (LTU), which is important especially when approaching regional authorities. In sum, an expansion of the work group has taken place during phase 0. While actively writing funding proposals for a pilot study and while trying to gain visibility for the project, SNC has begun to gather a core group of interested and talented researchers. Also, the project has found supporters and interested discussion partners at local, regional, national and international levels; reindeer herders, computer scientists, public servants and politicians; Sámi as well as non Sámi; within Sweden as well as internationally; people in developed as well as developing countries. This is one reason why the core group has remained determined to keep trying.

In a global information society noticeable identities have power, as they attract attention. One experience that came early on in the SNC process is that the two main identities represented by SNC have power to create attention; both high-tech and Sámi are eye catching identities. The title of this contribution, "When the red nose won't do", is taken from a web news article in international media, where SNC was presented. This cute association to Rudolph the red nosed reindeer is one example of imaginative qualities inherent in the combination of high-tech and indigenous identity. Sámi culture and history as well as ICT high tech serve as to create spaces for imagination that give "extra value" and thus help to maintain focus and mutual interest. This is helpful within the SNC group as well as in external communication. However, the likelihood that calling upon the mix of the Sámi and high tech identities will open up for communication varies widely. As mentioned, there have been moments, when the "local" women – in this respect both the KIS and NMKR staff can be counted as such – have met difficulties to access communication with official key persons. At some times, denying further communication or collaboration with the "local" SNC team members, have outspokenly been referred to as caused by the team and its individuals being or representing Sámi, reindeer herding and (more vaguely) women. Still, it is not the local team members but the SNC originator who has met the most unveiled reactions of denying the relevance of coupling ICT connectivity and the Sámi reindeer herding community together. Probably this has been because any of the other team members would from start be identified as inappropriate to be too spontaneous to in this matter. Thus, the originator has experienced road blocks in professional environments, which contributes to the understanding of events that would otherwise have remained "black boxes". One of the more visible forms of roadblock to even communicate around SNC in professional settings comes from those who do not understand why 'those people' would want such technology. "They are reindeer herders, what do they need network access for." Another is the reaction one gets from folks who hear the world Sámi and tell that it is unfair how the Sámi get "all the rights in the north" (i.e. who refer negatively to Sámi indigenous rights, such as fishing in mountain lakes.) On the other hand, there are also the people that don't understand why

anyone would want to destroy the pristine 'savage beauty' of the Sámi culture. And finally those who cannot let go of reindeer jokes long enough to listen to the proposition. All of these reactions, and more, have become standard obstacles that the principles in this project have patiently, for the most part, talked around. It has become a clear realization that this project cannot exist in a technological frame of reference alone.

A nomadic enterprise

In its local setting, SNC is an enterprise both to create connectivity and to challenge identity. Women reindeer herders challenge community norms by taking leadership; gender studies researchers challenge a supposed alienated or "other" position in relation to high-tech, and information and communications technology professionals challenge expected bonds to established partners, often multinational corporations. The social setting of the project leadership in each location being in the hands of women challenges established patterns; and the bonds created by these women, from reindeer herding as locally based industry, to the technical university and to international communities of high-tech professionals, do the same. At the same time, belonging to respectively reindeer herding, gender studies and the international ICT professional community is fundamental. The group has functioned through being not only computer professionals, gender researchers or reindeer herders, but still being exactly these things, and all that together, in a mode of transgressing institutionalised boundaries. In bringing the project further, step by step, altered identities and affinities have been used by each of the women involved and by the group jointly. The paradoxical stability of this mode of transgressions and instability may be explainable from that the individuals of the founding quartet are very familiar with this way of functioning. The members of this group carry not singular but sets of identities; the gender researcher originally being engineer, the computer professional originally being philosopher, the reindeer herders being teacher and health care worker as well, etc, etc. Also, the positions taken by, e.g., women who take on to being reindeer herders, being engineers etc challenge gender, thus they are transgressions. Rosi Braidotti's concept of nomadic subjects comes to mind.

In *Nomadic Subjects,* Braidotti (1994) presents a theoretical figuration for contemporary subjectivity which is "also an existential condition that for me translates into a style of thinking" (*ibid* p.1). With this figuration, she opposes simultaneously two states of mind; the monolingual and the phallocentric. Her points of departure are the experiences of being immigrant in several countries, and being feminist in a cultural and social order dominated by masculine homosocial bonds. She has been forced to become multilingual and multicultural, and has noticed how she shares this condition with several. Braidotti thus claims that being aware of transitions between sets of understanding, languages, locations during acts of speech, thought, living, is a widely maintained every-day procedure. Taking this awareness as starting point to cultivate a consciousness that combines coherence with mobility, is what generates nomadic subjectivity she argues. The nomadic subjectivity endeavour aims to cultivate a positive awareness of differentiation within oneself as well as within social categories at all levels; and the ability to transit, allocating conceptual schemes – also suppressing ones imposed by dominating discourses – as communicating states of experience. The monolingual monolith and phallocentric consciousness are false with their projections of unitary subjects, Braidotti means – they are also instruments of domination she feels an urge to counteract. Thus, the nomadic subjectivity endeavour is a political one.

Not least, the image of Braidotti's nomadic subject is evoked if SNC is considered as joint enterprise. On a statistical level, women are marginalised in the information society. Not least this is so, regarding such processes SNC concerns: research and development, including the steps where funding is raised. Yet, could any *but* women have initiated this process? Being marginal is cause to, as Braidotti suggests, women being forced to search for new opportunities where men more safely find a place in existing structures. The marginality that can be traced as starting point for SNC would not concern ICT only, but reindeer herding as well, and in the Swedish academy men have the majority of senior positions even though the distribution of students in fact shows a slight majority of women. Yet, as much as to the point, marginality is an adverse concept. The SNC originator is a woman, but hardly marginal in the information society. Instead, her position within the networks that informally maintain and regulate this society has been fundamental for SNC to become a feasible suggestion for solving the very intricate connectivity problem reindeer herding presents. While developing the architecture, discussions and chats with peers throughout the world has taken place, in which mutual gains were won. Apart from in surroundings where the word Sámi has hindered, it has been quite possible getting a hearing for the project. A funding component of the process has been how the team members act from a mix of central and marginal positions in "the information society". The SNC proposition has gathered a growing group of partakers. The process includes that men and women of both marginal and core positions within their respective communities have chosen to communicate with the SNC group, in some cases actively joining. With all those actions they have explicitly supported the process in un-hierarchical modes.

When turning to Braidotti's concept however, even if the concept of nomadic subjects is useful for making the SNC process visible, and the acts taken by those who are engaged in it, it is important to emphasize how far this theoretic concept is from the understandings of nomadism which are held within the Sámi community. The nomadic subjectivity Braidotti seeks to establish puts nomadism as transitions and loss of (false) unitary. She also explains the nomadic subjectivity, and symbolizes it, with the nomad being a polyglot. However, in a reindeer herding community the *most* nomadic is the *most* unitary, and the language of nomadism is the unitary language – the mother tongue. The partaking Sámi women carry nomadic subjectivity in Braidotti's sense because they *do not* own the nomad identity which is unitary in their context, where the privilege of living and defining it is that of men (Eikjok 1989). Furthermore, Braidotti describes how she as child originally learnt to perceive nomads as a threat to safety and order; a perception deeply European. But to the Sámi, the supposed "stationary" people are the dangerous ones creating chaos and decay – in concrete manners *thieves* who stole their country[6]. It is necessary to bear in mind that the nomadism of post-modernity is not the same as the Sámi nomadism; there are conceptual as well as material differences between these. Yet, the way Braidotti describes experiences of forced-upon transitions, and the strategy/desire to do something productive from them, could have been produced with Sámi women in mind as well as any of the European – Australian – American – Asian women academics she cites for her book.

The SNC project has functioned in a nomadic mode. Nevertheless, it seems inevitable that any high-tech project, also one with untraditional beginnings, at some point must secure unions with existing structures in order to develop efficiently enough. Evidently a reason is that these structures control strategic resources for high-tech research and development.

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[6] See Gaski (1993), Magga (1994).

At least that is how the situation was understood within the SNC group when the project set off. A question mark can be put to this. As it is obvious that there are problems to relate this project (or get the project related) to the units it structurally is supposed to belong to/be part of, a *totally* nomadic strategy might have been a better choice. Such a strategy could have been based on e.g. an Internet community. Such a community could have functioned from voluntary and mutual gain contributions that step by step built the system. A concern, however, is the possibility to make technology transfer and user participation part of a project such as SNC, not least if the participation of women is to be guaranteed. Because of economic reasons, it can be put to doubt whether it is realistic that advanced processes of technology development in a reindeer herding community can be held together at local level through completely voluntary participation, as there is no superfluous supported work force available. All members have to generate substantial income, and also those working "outside" reindeer herding must be ready to take part in herding economy where needed. This means for example women can have (at least) quadruple demands to answer to in their every-day lives: from paid work, from herding activities, from childcare and from housekeeping.

Gender is one of the main structures acknowledged as problematic for achieving "an Information society for all" in Sweden. The role of femininity in the SNC initiation and phase 0 processes is somewhat difficult to grasp (thus a perfect example of what Braidotti maintains). The core of individuals running SNC being women makes the challenge of the project to digital divides evident. To the Sámi women involved the women issue is at play in even more ways than getting connected. As the SNC project is genuinely open to women, contrary to much of other key and prestigious processes of concrete relevance in the local society, it is regarded by the engaged women as an opportunity to strengthen the role and influence of women in reindeer herding communities. It was essential for SNC getting started, that the women of the core group regardless of initial position in the information society, showed to share the thesis that technology and especially mastery of technology have a potential to remove barriers and marginalization, including gender patterns. Nevertheless, in much of SNC activity, the women issue is moved slightly aside and made to a digital divide – in general – issue. One reason why the women's issue is not more visible is the fact that official channels whose aim it is to support gender equality has not had any direct clues as to how to support the process. Rather, they have been bewildered as to what to do with SNC, for example when approached in critical moments when SNC has faced threats of being stopped. In the end, rescue has come from regular ICT and business circles. It is probable, that a general impact on Swedish policy making from gender equality policy, including the issue of national research and development and its funding, has functioned as invisible support throughout the initiation and phase 0 processes (e.g. "mainstreaming" policy). However, it has become unworkable to emphasize the gender equality aspects of SNC, when relations to gender equality bodies have not been possible to establish. Furthermore, there is also one more aspect of the gender issue, namely the connectivity problem which SNC address. It is not as women that the KIS project workers experience being among the "have-nots" of the information society. It is as Sámi semi nomads. Sámi women are not connected when in grazing lands, regardless whether choosing a strictly traditional role as women, caring for children and the household, or a transgressing role as herders, pre occupied mainly with the herds. The connectivity problem is a Sámi problem, not a gender problem.

A nomadic technology

The Swedish government has stated that the Information society shall be "for all". Why is ICT a matter for reindeer herders? An answer can be posed in three stages:

1. There are egalitarian – "same to all" – qualities or potentials in ICT, e.g. business and education, taking part in political processes, leisure, and social contacts.

2. There are qualities related to the reindeer herders as part of an indigenous population living as minority in four national states – the Sámi. E.g. creating spaces for discourse, promoting own language.

3. Yet, the terms are crucial. If ICT is available only on terms of stationary living much of the potential is lost, because the herding is a semi-nomadic activity.

In fact, "the information society" carries promises to Sámi semi nomadism that goes beyond the national visions of "an information society for all": to again heal a culture which is today strained by the need to adapt both to the nomadic requirements of herding and requirements from modern society of being stationary. Providing connectivity in the heart of reindeer herding country will make the development of a number of applications meaningful to the user community. Successful application of distance spanning technologies have potential to increase business opportunities, vitalize herding methods and make it much more feasible combining the areas of life production and reproduction, in all to strengthen the possibility to continue Sámi way of life. For this, semi nomadism is a vital core, yet requirements from modern society cannot be discarded. They must be met for decent social reproduction, e.g. consistent schooling – which of course could be adapted to semi nomadism via arrangements based on distance education part of the year. The potentials for ICT to serve Sámi reindeer nomadism, however, rest upon the condition that connectivity is actually available on the terms of nomadism.

When putting up a goal saying Information technology shall be "for all", as has been done in Sweden, some thoughts are nevertheless given to costs: development and implementation of information and communication technologies require resources, and at the end of the road it appears unreasonable that "all" shall actually be provided: worry about marginal costs causes reservations. For that reason, the Swedish policy of equal access to all has been subject to modifications from the start. One recent example of such a modification is the handling of 3G licenses. In Sweden, large fees have not been required for such licenses. Instead the requirements are that the equal access policy shall be followed. Still, in due order it is thought of as unreasonable to ask license holders to actually provide access to all. The limit is put to that the license holders shall eventually provide 3G access to 99.98% of the Swedish population, and there shall also be geographic considerations. 99.98% is certainly a lot. The trick for understanding how this relates to reindeer herding communities is to pay attention to how "population" is measured. In Sweden, every individual must be registered at a fixed address. From this register, the geographical distribution of the population is calculated. To reindeer herders of mountain Sámi culture however, "home" is in different places, distributed throughout the year. Both economic activity and social reproduction is coupled to this structure of the place of home varying with season. But as an individual is only permitted to be registered in one place, the seasonal variations risk being over looked. In fact, tying ICT infra structure to population density carries a number of problems, which the Swedish government has been forced to deal with lately – especially with regards to mobile

telephony. The police, for instance, have experienced problems in fulfilling their duties in sparsely populated areas i.e. areas with either no or intermittent mobile communication coverage, for example in searching for dangerous criminals. Another example is that timber industry, which is the source of forty per cent of Swedish export net, predominantly operates in sparely populated areas. (This is of course kind of prerequisite for forests.) Yet, both security and efficiency require that the people who work with the timber be able to communicate. However, rising above the details of marginal costs, and the discussions of the exact position of where this cost turns unfeasible, the fact that information and communication technologies are not available to the nomadic life style of the Sámi challenges the concept of ICT as *limitless*, i.e. making place and time irrelevant. In this respect, the SNC solution has a couple of qualities, or features, that are interesting to highlight from an analytic perspective.

1. In SNC, connectivity is designed to rely on use of mobile relays. The probability that this will function to the vast grazing area that reindeer herders move within, rests on the observation that concentrations of population occur throughout the year, at different places. This population characteristic can be captured as "global scarcity but local density". Largely, the area is populated by 0.0 persons per square kilometer, which indicates one would have to wait very long to meet some person or vehicle carrying a relay to further ones communication. Yet, the statistical mean value does not describe how the area is in fact populated: not evenly distributed but dynamically. The fact that the SNC connectivity solution, designed for one of the most sparsely populated regions of Europe, is socially based indicates how finding communication systems for challenged areas may win from thoroughly investigating presumptions about circumstances that are marginal in relation to dominating ways of life. SNC has challenged the presumption that sparsely populated areas equal social isolation, which is usual in Swedish discourse.

2. The opportunistic routing of SNC catches a way to function which is often required from people who live in sparsely populated areas: flexible, non-specialized, taking all possibilities into account. Thus, the connectivity proposition harmonizes with strategies already practiced to meet the type of conditions for social and cultural reproduction it shall serve. This mode is also very nomadic; not putting up massive structures of its own at every instance, but adding something small which is possible to carry around, to enable making use of those that already are.

As well as the qualities of the connectivity proposition itself, the different ways in which the proposition has been acknowledged are important to take notice of. People who are to judge upon SNC's worth sometimes react negatively as the system will not essentially provide real time connectivity. This is the case at the same time as the very power of SNC to attract attention from *researchers*, is its handling of intermittent and probabilistic connectivity. These differences may be explained from the fact that, commercially, speed has become the mark of cutting edge technology. As this perception has become deeply intertwined with the technology, a third point of content may thus be added to the list:

3. Except for people who are deeply engaged in Internet development, most will make their judgments based on the standards communicated through commercial channels. This adds up to the pedagogical problem of SNC: on the one hand some people question why reindeer herders would want connectivity, on the other hand some question why such a slow connectivity system should be established even if it might be the first step to establish connectivity at all.

"An information society for all" and reindeer nomadism

This paper has told about the origin of Sámi Network Connectivity as a technical proposition and as common ground for political action, and its process as far as where it is at the moment of writing. In numerous ways, the concept of *nomadism* has relevance – material as well as theoretic. It has theoretic relevance as fetched from post modern discourse, and material relevance basically as the future users of SNC are Sámi semi nomads. It has relevance also because of the nomadic wanderings the SNC project has executed, through questions of identity, constraints and possibilities in a Swedish landscape of ICT policy and practice. The experiences won give information about how a process of closing one gap in the digital divide may proceed; some examples of where obstacles and induction may take place for a digital dynamics. In some respects, the SNC project is going well, and the project leadership is happy and hopeful. In other respects, the project has consistently encountered road blocks of a different sort. Sometimes those roadblocks are easily attributable to the sceptical reception any new and somewhat surprising technical idea receives. In other instances this is not so clear, or even explicit that a matter of identity is rather what is at stake. This is true, at the same time as individuals of organizations or groups that are marked by negative attitudes may well be positive, and at the same time as every organization that could well have been marked by racism is not. These individuals and organizations are crucial for a digital dynamic to develop.

Positive attention had been gained already before the launch of SNC, in the introductory contacts with the Center for Distance Spanning Technology at LTU, which lead to the SNC originator's knowledge of the co-operation. However, the SNC proposition did put the co-operation KIS-LTU into the position of being technically appealing at international level, which obviously had affect on the scenarios that emerged. The SNC experience points towards positive possibilities of digital dynamics: towards readiness amongst the "haves" of the information society, to co-operate with people whose needs are not met in at present. A first point to acknowledge is the political goals stated at national level. A feature of this dynamic of change is, however, how precisely those qualities that make the SNC proposition attractive and urgent, are problematic when measured against the standards thus far developed to measure the fulfilling of national Swedish goals. Above challenging social structures of the digital divide, SNC challenges the conception of ICT. By doing so, it makes evident contradictions between the perception of ICT and its actual performance. Information and Communication Technology is understood as enabling a certain type of freedom, which eliminates the boundaries in time and space. The word *limitless* is a key. But as constructed today, these technologies do not serve for the nomadic life of reindeer herders. The degree to which this dysfunctionality – *the limitation of the limitless* – is the case was perhaps not evident to all the individuals that came to form the SNC group at start. But someone suggested that the reindeer herding community could have access to Internet and e-mail from any of the locations where they would move and stay, and as this was presented as possible, the present condition became possible to put in question. One might suggest that as existing ICT technologies where built up by and for people who are rooted in industrialized society, they carry structures and presumptions which compel a life adjusted to mechanical time and to a closed room, bound to a limited set of places created through industrial location. For this reason, co-operating with reindeer herders, building up a system from the roots of their lives and culture offers an excellent venue for innovation, truly challenging time and space. Moreover, the nomadic life has qualities to imagination. This is a potential too, possessed by Sámi culture and identity. Semi nomadic life style genuinely incorporates values and ways of being often referred to as coupled to "the information society".

Up dated presentations of SNC are currently available at www.same.net, click Saami Network Connectivity.

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