Negotiating Terrains: Stories from the Making of "Siida"

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In this article we develop some arguments from a research project where the researchers were also participants in the making of a multiplayer online game. The "Siida" project emerged as a challenge to the static and monolithic vision of Indigenous Saami culture and history. It seeks to create an arena for learning founded on new approaches to research-based historical pedagogy. This involvement became the grounds from where we could reflect upon what design is all about. We will argue that in order to work, design needs to relate to the specificities of place and be located as multiple practices. As a methodological tool for the analysis of partial connections between actors' knowledge practices, we put the concept of material boundary metaphor to work. We tell the ethnographic story of a complex media production as an on-going negotiation between knowledge and technical design.

Keywords: Designing, Material boundary metaphor, Saami culture

Introduction

The aim of the Siida project was to create a multiplayer online research-based digital game that could work in a multicultural learning environment. *Siida – the play for the past, the battle for the future*, started as a pilot in 2002, and the pilot report was completed in 2003. The main project period lasted from 2004 to 2006, with a finished beta version completed in 2007. We as researchers wanted to re-frame what Sápmi might be, Sápmi being the land of the indigenous Saami people, also known these days as the high North, a terrain of migrations of many different nomadic peoples over time. Colonialism has been practiced there by different nation states, and national borders were set as late as in 1905. Before that, different ethnic groups have been competing, interrelating and co-existing for centuries. One of the explicit intentions of the project was to promote justice for people and places. We set out to create a multiplayer online game that would bring out the complexities of something that straddles the past and the present in a particular place and evoke a historical consciousness in the players. The project was grounded in the researchers' commitment to creating an arena for learning founded on new approaches to research-based historical pedagogy or didactics (Ekeland, Kramvig & Orgdot, 2003: 4). We needed to ensure that the past, as our collective memories, could be performed as open and with multiple layers, and not closed as it has been by colonial grand narratives.

Colonial history in Norway has meant that the borders between the Norwegian state and Saami traditional territories (Sápmi) are not easily defined, nor can the Norwegian and Saami identity be clearly defined. Local communities are multiethnic, and people actually insist on making multiple and heterogeneous social relations explicit (Kramvig, 2005). Still, the closure of the colonial legacy is present within communities and within institutions, making Saami knowledge practices subordinate even though decolonization is an on-going practice both in political and everyday life.

Our ambition in the Siida project was to create an intersection between dominant and subordinate knowledge practices, and in this article we suggest one possibility of how this could be done. We wanted to highlight that cultures are highly flexible entities, and that this is no less true for Saami cultures than for any others. This contrasts with the representation of the Saami found in educational programs and teaching materials, which often represent Saami culture and history in a narrow and mythical way. We hoped that getting pupils to perform otherness in the past, within the context of the game, would inspire them to reflect on the challenges of multicultural life in here and now. We saw digital games as a useful tool for entering into a dialogue with young people. We do not limit our thinking to the practices and experiences of a multicultural society as can be found in the High North, but rather see ourselves as taking stories from Sápmi and making them relevant to the on-going 'othering' being done in many classrooms in contemporary Norway.

Negotiating terrains became a useful metaphor in our common aim of keeping the Siida project together, where we needed paths or tracks to walk along and find our way through the terrain. The Arctic landscape may seem limitless and wild; it is easy for beginners negotiating this terrain to get lost. On the tundra there are few mountain peaks or other distinct landmarks aiding navigation. Those familiar with Arctic landscape formations, however, will find tracks and marks to follow and see paths to provide a comfortable journey. If the landscape is unfamiliar, one can get stuck and find oneself at a marshlands or at a riverbank, unable to progress further. This metaphor also made us reformulate what designing is all about.

In this article, we will walk you through some paths that, throughout the project, somehow led in different directions, but also crossed each other along the journey. We will examine the assemblages that emerged in the process of designing the game, approaching the production of the game as a collaborative design issue, and drawing ideas from within Science and Technology Studies (STS) to help guide our analytic framework for understanding the practice of transformation in design. These assemblages appeared as visual objects crafted together by both human and non-human actors. We learn by being involved in the transformation of diverse materials and accountabilities in the Siida game, which also involved a disconcertment that became the basis for making completely new devices. The tracks that we made in this specific project, by celebrating the partial perspectives we encountered, involved change and even cracks, but still the whole remained a project that kept us together. As the community of creators we were at risk of falling apart at times while the project was running and yet we, by which 'we' means a split and contradictory we, were kept together by our loyalties towards the project vision. Here we tell an ethnographic story about designing in a complex media production context, taking inspiration from Suchman (2002; 2011), and Verran

et. al. (2007). They formulate the concept of local accountability as a promising one and enable us to see design as an on-going negotiation between knowledge practice and technical puzzling.

Local Accountabilities in the Social Landscape - Capturing Data

In Siida project a group of researchers, programmers, designers, students and bureaucrats from different institutions set out to intervene in how stories about the indigenous past and present could be told. As a group we were enthusiastic; some of us were friends, coming from the fields of art, programming, game design and indigenous and learning research. Some of us were Saami and some Norwegian; some worked and lived in Sápmi, others in Oslo, the capital of Norway. The fact that the majority of the people connected to the project had multiple kinship- and other relations with the northern region, indigenous as well as non-indigenous, reflected the complexity in the region itself. We wanted to see if we could work and create something interesting for all of us as well as explore the possibility to use digital technology as a tool to do collective memories differently. The game-production company that became involved was established in 1998 by an artist and an author of fantasy. Soon the company became prizewinning and fast-growing in the production of online-games and the designing of new web-solutions (see Orgdot, 2012). We applied and received funds through the ITU´s research programme on learning and digital education to begin searching for common ground.

In the first workshops in 2002 we came together with different historical documents, ethnographic stories, images, maps, tapes with storytelling from indigenous peoples, personal stories and political concerns of what life in the North in the past and present were all about. During this period we produced quite a few documents that highlighted the specific features and concerns the project should relate to. We all made efforts to translate our different knowledge-practices into something familiar for the others involved. From the beginning onwards it was highly important for us to create a tool of awareness and highlight the political aspects of new industrial ambitions in the High North. Still, with the ambition of using digital technologies to do the collective memories of indigenous communities, this highlighted the way Sápmi and the High North where different landscapes of people, rhetoric and interest played out on the same territory. We also invited researchers from the field of Saami religion and history as well as gaming from the University of Tromsø and Volda University College as partners in our reference group that responded on the script in progress and the prototypes of the object of the game.

These expanding knowledge-practises interacted with the prototype of the game in progress. The prototype was supposed to uncover users' needs, technological possibilities and invent work requirements. We as a group set up a different workshop with representatives for our target groups, logging and filming the use of the game, the dialog between the pupils and the technological errors that occurred during these events. The prototype came as an artefact with particular performative characteristics; still we embarked on a cooperative design effort.

Through the process of the development of the educational game, the participants often met the same challenges and negotiations that we imagined would be central elements of the educational game itself. The project became an assemblage of different human actors in interaction with non-human actors such as technology

and organization-ordering devices. Latour (2005) describe assemblage as a type of connection and a movement deciding what binds us together and how we can destabilize and interrupt and open up social connections for reassembling. Reassembling insists upon reconnecting established relationships in order to ask question on how they come into being. It is not about Hegelian totalities, in which parts are mutually constituted into sameness and the whole, but more about an uncertain and unfolding process that is very partial (Law, 2004: 41). We are asking how reality is assembled, rather than identifying what it is. We position assemblage as a composition solving tool which is emergent through activities, both material and expressive, as components assembled through processes. It is a view that is temporal, situated and relational, local not universal (Mol, 2002: 33).

We – the researchers writing this article – ended up holding more than one position in the project, and we also needed to shift from being researchers to being commissioning agents, teachers, 'experts on Saami culture', and we needed to learn to think about code-crunching, images and characters. "So much comes together in the collaborative webs of complex practice" (Law & Mol, 2008: 73).We can say that there also were different ontics at work. Verran (2007) exceeds the Kantian dualism, or knowledge, as something within the person, complete and static and with a given distinct separation from the outside world. Ontic depends on what we humans contribute in our embodied participation with other entities. We use the term because it describes the outcome, or what is done in the collective acting. Being becomes a multiplicity of differences that is recognised as emergent realities. It is a form of a performative knowledge which directs where knowledge is produced at the point of situated, local and partial understandings.

In an odd way, the process of developing the game became the game that we developed: the different paths and fields of knowledge that were set in motion in the research and development project were just like the paths and fields of the game itself. The project built networks of affinities with few beginnings and no ends, but it also multiplied visions attached to the expanding of the project that exerted obvious control. The company Orgdot also expanded during this period – which had some effects on both the structure and the model of the organization. Orgdot withdrew from the game production in 2006; Copyleft took over and finished the beta-version in 2007. The academic and financial institutions that commissioned the work understood their work to be to initiate processes that contributed to the production of new digital educational objects and new knowledge of their use.

To account for how research can be situated as well as emergent is a step in localized accountability (Suchman, 2002; 2011). Indigenous knowledge, as with the practice of a Siida and the practice of research, is always both local and performed. Our knowing is, in Haraway's (1991) terms, partial, locatable and critical, which makes us responsible for it. The only possible route to objectivity on this view is through collective knowledge of the specific locations of our respective visions (Suchman, 2002: 96). The arguments that follow draw upon a form of auto-ethnography: we were struggling to reflect upon the routes that we were involved in making ourselves. We set out to reflexively problematize the ways we managed the contradictions that appeared in the ongoing project. One of the persons from the game company explained: *"Everything had to be built from scratch – you had to learn along the way, as there were no methods for constructing a multiplayer [game] in an*

educational setting." The Siida project can be regarded as a process where the map had to be created along the way, and the paths towards the finished game had to be cleared. Few of the marks indicating the paths could be found in the terrain, you needed to try it out, moreover, in quite a rugged landscape, examining the paths as you walked. This applied to the landscape, but it even applied to the ethnographers. As Annemarie Mol (2011) has highlighted, the ethnographer is produced through a kind of self-exposure in the text that allows the analysis to change track, tell different stories or articulate different objects. We set out to expose ourselves in the text, but even more to expose the on-going negotiation we had engaged ourselves in.

We use the concept of knowledge practice, which does not deny knowledge structures, but instead draws attention to the fact that all human communities have complex and varied ways of dealing with issues in their practices. We try to show complexity in the knowledge practices the actors perform (Law & Mol, 2002: 11). Knowledge can be formal and well-articulated, but also embodied and passionate, such as some particular contemporary ways of doing knowledge. Knowledge practices are also ways of ordering other practices, bringing different pasts into futures (Verran, 2002a; 2007). In poststructuralist writing, the simplifications that occur in knowledge practices are seen as productive; on the one hand, there is an order that simplifies, and on the other there is an elusive and chaotic complexity that is expelled, produced, or suppressed by it (Law & Mol, 2002; Law, 2004; Latour, 2005). Law (2009) reminds us that creating a new device can be a messy project – so is research. It needs to be grounded in empirical case studies; not case studies in the conventional sense, but case studies where theory is embedded in and extended through practices, and where storytelling interferes in the way relations are assembled. He also argues that case studies should consider the messy practices of relationally and the materiality of the world (Law, 2009: 142).

In this article, we want to let the complexity run its course whilst still seeing the project, ourselves, and the language we use, as parts of a heterogeneous network. We will, at times therefore, become trapped within the very ordering we set out to challenge. The performed knowledge becomes part of theories of how things, identities and other discursive effects come into being. Here we ask how the multiple performances of actors are engaged and interfered with one another through the complex assemblage of human and non-human elements in a social-material process of production. What sorts of utterance and activities might we read and see that arrange people and objects into sets of relations in the design process? How was it possible to make a new device in the assembling of different actors?

Our first concern is the utterance of the human actors opening the main project. We open up paths towards differences and still argue that the design process was a series of engagements. Designing became the outcome of discursive and material practices, where similarities that enabled the making of difference needed to be uttered. Our second concern is the objects – as effects of networks of relations. Designing performs these relationships, where human and technological aspects enact a specific vision of the real. Our third concern is to incorporate organization as an ordering device where knowledge grows through layers of collaboration. Organization is seen as an object of design – as procedures organizing work activities. This is also a situation where friction occurs as a form of resistance to change. Can innovation destabilize and open up assemblages to other possibilities?

Locating Design: Starting to Follow Some Tracks

In the pilot design project, we noticed that different knowledge-practises existed between the institutions and actors we wanted to bring together. One person from the game company said: *"We have all had an idea of what this project should be, and those of us from the communications and game world had our own view of this, and those from the academic and research world had theirs. But I guess we still felt that there was some progression and found some models for how we could work."* The utterance makes a distinction between 'them' and 'us'. This is an actor's perspective on how Siida was assembled. In the project, many different people and academic interests and forms of language met: education, anthropology, archaeology, history of religion, programmers and gaming expertise, script writers, designers, producers, project leadership and commissioners, for instance. Some of these are part of more recognizable discourses and thus can, to a greater extent than others, move along the same language trails across the terrain. In other settings the statements may be so different that the parties have but little chance of understanding each other's' language games, for instance, when the statements of the researchers meet with a statement from the world of game technology: *"…with his dialogism he sought to show the interaction between varied meanings that circulate in the social universe…"* meets *"…layer 1 in the client will consist of the implementation of the protocol and an interface with layer 2 of the client…"*[1] These examples are linguistic metaphors that the human actors use when they construct and negotiate understandings of realities. But they may also not make much sense in each other's' fields of knowledge, creating a clash between the actors. Our work involved different knowledge practices, so we were, in a sense, walking along different trails through the same terrain. In our discussions during the pilot project, we thought we understood each other quite well in the group meetings, but when it came to reporting we realized we were working on different issues. As a result, two Siida-types emerge in the pilot report. We shared one project, but the design process made it multiple.

Reconsidering the project later, another person from the game company stated that "*the pilot project report can be seen as a report on two pilot projects, different in language and character, and with divergent views of the tasks and solutions involved, put together*." When we go back to the different texts written up through the process, we can see from the start that we worked not so much together as side by side, something that is clear in the language. One person from the game company expressed his concern that *"at the beginning it took a lot of time to understand each other and to think aloud to see if we could produce descriptions that allowed us to participate in each other´s worlds – and that wasn´t particularly easy."* This utterance can be read as what Verran calls different ontics at work, showing that our knowing is limited to our location and is based on partial perspectives (Verran, 2007b: 166-170). Ontic recognizes itself as performative, emergent and partial. It can be made visible through storytelling or other forms of embodied performance – such as our report. It emerges in collective actions and is not given once and for all. This conceptualization allows for the rituals and routines through which we "do" our worlds to remain a puzzle. Emergent realities can be acknowledged, appreciated, accepted, and recognized – though one may not necessarily be able to account for them. Actors and structures are inseparable and mutually generating processes within a complex field. Therefore, reconsidering

the pilot project, we can find relatively standardized forms of interactions in the form of frequent repetitions of an "access code" – saying the right thing. This is the reality of the actors who become a part of the discourses that they perform. When these meet other actors with other repertoires and performances, the ritualized discourses may turn out to only partially contain overlapping configurations of sameness and difference – and as a result a movement can be created among actors. We can say that different fields use sets of metaphors for thinking and enacting in the world, and this creates disconcertment in the process of knowing and creating (Verran, 2002b). Designing is a negotiation with other ontics, and therefore a kind of intervention, and it can be innovative if it involves making differences that disrupt particular familiar and standardized ways of doing work to create new devices. But in order for a collaboration to succeed, a measure of joint understanding is required, where the trails cut across knowledge and thus also across conceptual boundaries.

During the pilot project, the researchers and game developers worked with loosely organized network-based procedures. Knowledge flowed relatively freely in our exchanges. The actors were mixed together and mutually supportive of one another in the knowledge performance. It was for us a creative and collaborative kind of work, a practice. We made this practice a central concern of the process itself, which meant we had to break up and redesign the uttered framework of "us-them" in our analysis of the working process. We want to attend to practice, and not only people's perspectives, because a perspective tends to refer to meaning alone whilst the physical reality of the object being studied recedes into interpretations (Mol, 2002: 9-13). The 'we' from the communications and game world, for instance, is not a simple category. One point Banks and Humphreys (2008) have made is that the different levels of the company are counterposed and multiple. Programmers and designers, for example, have different ideas and motivations. Banks shows the complexity of relationships that exists within companies. In our case, we had to find a model for understanding the complexity of modern media production practice and pay attention to how it worked in our design project.

In organizing the main project, we directed attention towards and used resources to negotiate partial connections between the different knowledge practices involved throughout the project. The return to "things or objects" in the social sciences shifts to how materiality acts in the world. Latour (2005) and Law (1999) have shown how materiality plays a part as actors in structuring social relationships. Law calls this "semiotics of materiality" (1999: 3), or material – semiotics tools and describes the enactment of materially and discursively heterogeneous relations (Law, 2009: 141). He takes a semiotic perspective and applies it to materials and pronounces a relational materiality. We want to make a concept that bridge between objects and the semantic in our design process.

Susan Leigh Star and James Griesemer (1989) have developed the concept of 'boundary object' to refer to something that points to the sameness that is required in order to bring different knowledge practices together, to work towards a joint outcome. With a boundary object, it is not necessary to produce the same, and thus overlapping, sets of concepts, definitions of the situation, and understandings of the outcome in order to proceed with collaboration. This concept creates a room to speak of designing objects in a negotiation border zone between actors and as a way of dealing with the complex interactions between people and objects. Our concept of material

boundary metaphor is developed from this idea, together with Paul Ricoeur's (1981) understanding of metaphors and language. This opens up forms of analysis towards a "material-semantic" tool. Designing is an achievement of discursive and material practices that is always partial. Metaphors have to be located because their meanings are floating, local and have to be interpreted; they bring one unambiguous and one implicit meaning relationship together. To understand this, Ricoeur (1981) brings together the gap between symbols and metaphors. The symbol brings together two dimensions, one linguistic and one non-linguistic (Ricoeur, 1981: 61, 174). For example, let us take the well-known symbol of the Swastika – a cross also used by the Nazi – an ornament which can be dated back to the Indus valley Civilization and used by the punk generation, for instance. The symbol refers its linguistic elements to something outside the linguistic reality. When we talk about it, the reference is an orientation against a non-linguistic world. The disclosure is to articulate the meaning we refer to, and this is expressed in the utterance. This metaphorical utterance is a linguistic surface of the symbol. To explain something is to articulate understanding in sentences – a word group. And it is in the local setting this is expressed that we can try to understand the meaning of the text. It is in the semantic surface where we present knowledge about the reality we understand. Interpretation of a symbol is therefore also a speech act were we create language categories of the reality we experience. But at the same time, we will read the symbol differently depending on if it is performed in a Nazi or in a Punk setting.

Assemblage of objects can be read and it can generate affects for acting and being acted upon. We make these connections in order to highlight the relationship between materiality and the semantics of the discourses at work and to better understand partial connection, that is, our ability to understand others. As we shall see, we could not separate object from discourse in the creation of the game, what was "outside" could only be reached through uttering it. In this way, human language and designing are stuck to each other. In the pilot report, different views about which part of the designing was important became performed, and the negotiations that took place in the main project were also a remaking of metaphors in a located situation.

The material boundary metaphor points to the existence of such objects precisely in a border zone between different realities. In the designing process, material boundary metaphors often had divergent referential meanings for the implicated actors, and through negotiations the design object could be redesigned, which will also become clear in this article. Material boundary metaphors are thus intrinsic, both in locally anchored and general systems of knowledge. The formation can make communication and interaction across differences possible – without it, the joint projected outcome may break down. This could work for us to make some of the complexities visible, and to be a methodological tool for how partial connection is incorporated in the designing. Activities take place not as a singular achievement, but the reality can discover multiplicity where differences overlap and interfere with one another. Our vision is to open up some of this situated Siida assemblage.

Material Boundary Metaphors at Work in a Negotiating Terrain

As an illustration to show material boundary metaphors at work, we look at the avatar as a concept and character in a game. In this way, we can pay attention to the role of

"objects" in constituting social relations, but we also explore the ways in which the social interacts with, and shapes, its objects through practice. By following how design was done and performed in our example, we are asking how reality is assembled and showing how its movement can be mapped in the act of doing design.

In the pilot phase of the project, the avatars of Siida were "symbols" in the way that they were not effects of the heterogeneous network between actors uttered as coming from both the academic and the research world and the communication and game world. The design of the avatar in the pilot project was actually a view from somewhere that did not incorporate all the actors in the project. It was a vision where the developers from the communication and game world performed a knowledge practice as a kind of image of the Saami people (Haraway, 1991; Verran 2007b). At the start of the main project, the symbol of the avatar had already been placed in a particular discursive situation. A range of instructions already existed regarding how the concept was to be seen, and these were uttered in the report from the pilot project that had earlier been expressed by actors as part of our divergent views.

Later, in the main project, the "symbol" of the avatar we see in Figure 1 became part of a discourse between different competences among the actors. Let us show a part of these local accountabilities. One person from the developers expressed his idea of the avatars' properties; "*…they should be charming, be easy to like without becoming too banal. At the same time there are technical requirements that need to be met.*" We can say that the statement includes a technical reference, a reference to game design, as well as a reference to the target group. The metaphorical utterance refers to three dimensions: to what the reality of the object means, to who it is talking, and to how he understands the target group. But this is a linguistic utterance that had to be interpreted in the specific and located situation where it was uttered (Ricoeur, 1981). Arriving at explanations of what an avatar is, is to express means articulating knowledge and performing the design of the avatar; and in this way he/she becomes an actor participating in subsequent creations and negotiations of the game. The metaphor

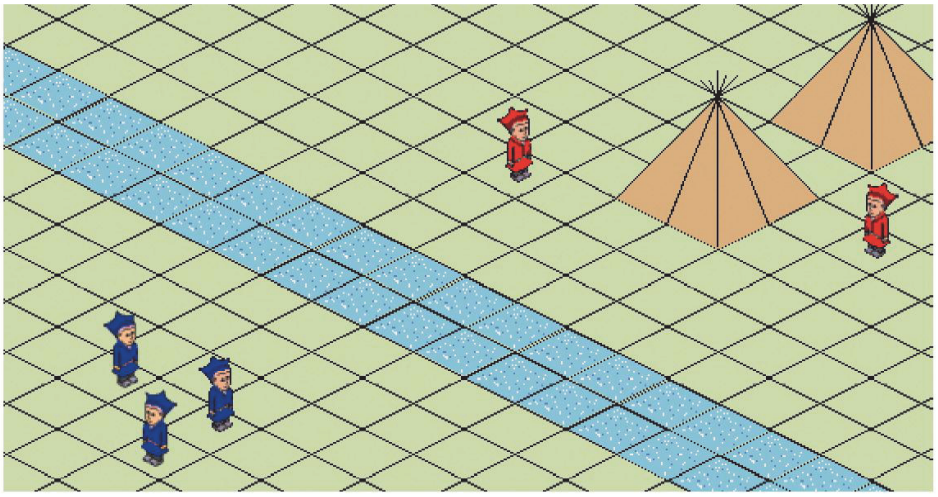

Fig.1: Appearance of avatars in the pilot report

then became the expressed meaning of the symbol (Ricoeur, 1981). The presence of the avatars became an assembling point and made multiple visions possible. The concept of 'avatar' had an associative repertoire, that is, available stories that could be told about it. At this point of the intersection, the avatar became a material boundary metaphor and an actor that could not be separated from the social assembling (Latour, 2005). The avatar became a co-actor in the heterogeneous network. It became a particular performance of technological assemblage, science, design, gender, programming etc.

Bringing together different knowledge among the actors created associative openings. Another person's utterance could interrupt the closure and open things up for change. For instance, the researcher's notion of the material boundary metaphor made other references and therefore interventions possible. One researcher argued in this setting that it was required to challenge the myth of the Saami. It was necessary to avoid portraying the avatar with 'Kautokeino hats'[2]. The avatar also needed to relate to the historical context that was the starting point of the game. The researcher was referring to what was important to her, for example that hats vary from area to area and change over time. It was central that the avatar did not appear as something stereotypically "Saami". These arguments show only a simplified part of the process, where the researcher's utterance led to a significantly different view from that of the other participants in the design. Different ontic in understanding how the avatar could be done became a negotiation that we shall see resulted in a redesigning of the figure. But this knowledge practice of doing the avatar also arranged people and objects into different sets of relations.

The avatar can therefore be understood as a material boundary metaphor that was negotiated into a new way of being between different actors. We can say that the "symbol" became alive and reborn in the semantic dialogue between actors. The material boundary metaphor had a divergent meaning for each of the implicated actors; it was also a metaphor that pointed to the sameness that was required in order to get different fields of knowledge to work together. It was what made communication and interaction across differences possible. The avatars embodied networks in which knowledge practices were bundled together, and they were transformed through these networks.

The designer produced instructions regarding the properties required in the game; an animator gave shape to the appearance of the character, and this was then tested with the client. This was a reciprocal process between actors who had recognized competencies in each other's fields, and who thus could challenge each other with respect to the final figure. The notion of assemblage can help us to understand the range of actors, practices and relationships that make up the design process. Boundary metaphors also constitute social relations, whilst actors reassemble the social through reassembling the visual (Latour, 2005; Kimbell, 2008). This shows how different actors can come together in complex relationships in the design process. The process both connected and separated actors in different ways in relation to the task.

Fig. 2: The first reborn avatar

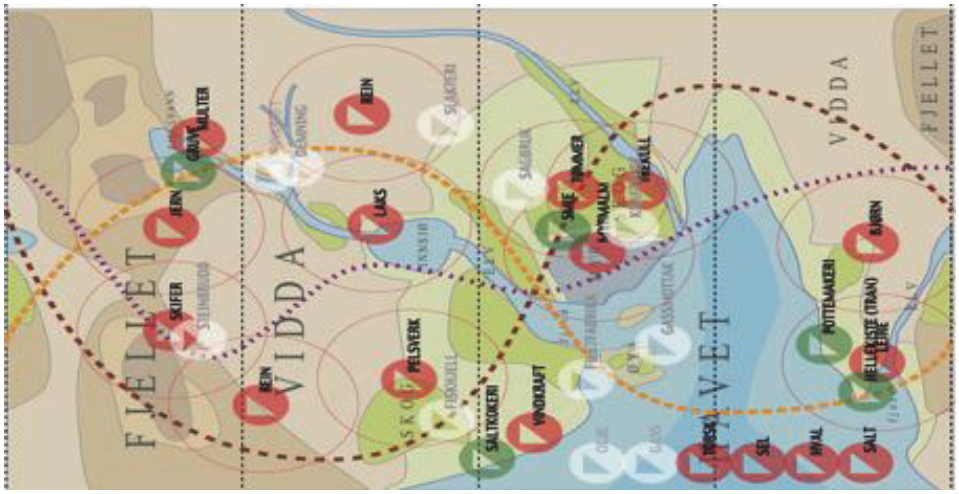

Fig. 3: The landscape symbol in the pilot project

The first avatar shows the appearance that was produced through the partial connections made between all the actors in the network. In the process, the figure "talked back" and the developers saw that it had been given too "sweet" an appearance. For instance, the avatars' heads were large in relation to the rest of the body. The reason given by the developers for this choice of dimensions was that it is facial expressions that most easily communicate emotions. With reference to the pupils, it was assumed that this appearance would make it easier for them to identify with the avatars. We do not speak of the avatar as an object outside their relations. Rather, through the process of generating this appearance, with its own particular qualities, the avatar emerged as a material expression of all our relationships, it became an entity but with partial connections. The non-human makes agency – they assemble human performativity (Mol, 2002).

Many processes ran parallel at this stage of the design project: for example, the pilot project was generating a kind of symbol for the landscape as well as the avatar.

This map shows different resources and paths of migration from the tundra to the sea. As the map was reassembled through the practices of the various actors in the main project, it became a material boundary metaphor through which the negotiation of the arctic landscape progressed. The Siida, as an online game and design project, became a representation of an imaginary place in

Fig. 4: The landscape becomes a material boundary metaphor

Fig. 5: The avatar integrated in the landscape

the High North. It was a performance and a way of doing place.

As the development work proceeded and the landscape in the game became moulded in a way that gave it quite a realistic visual appearance, it became clear that the avatars did not fit very harmoniously into the landscape. One main goal in the Siida project was that the landscape or environment should relate to the Arctic region. The player's experience should be one of travelling; with the basic premise the landscape itself should provide a framework for the social activities in the game. A key point of negotiation in the process of developing the landscape for the game was finding a balance between stylization and something regarded as authentic by the various actors.

At this stage, the technological solutions had become relatively fixed and there was little room for change. We had started out with an open framework full of possibilities, and by this point it had narrowed down as the work had been done. Now that the avatar was placed in the technological terrain it almost existed in its own right. And it enacted resistance. A second avatar emerged, this time performed at the level of detail: its head was given more realistic dimensions according to the game designers, the dress was changed from blue as in figure 2, to be more Arctic-looking with fur garments according to the researchers arguments etc.

Fig. 6: The second avatars

Fig.7: A client window

In the design of the game – the appearance of animals, buildings, equipment and other environmental factors – the same guidelines were followed that had shaped the work with the avatars and the landscape earlier. Some ideas where uttered in the whole group, and at other times the visual reassembling was social in other ways, for example, through the frame specifying what the client-window should look like for pupils entering the game. This work was done without the researchers or the reference group present.

In other situations the reference group was important. For example, it had an important role as the material boundary metaphor reassembled actors in different ways, for instance when an archaeologist from the reference group and the designer worked on some pre-historic items.

Fig.8: Saami sacred drum and ceramics pottery

Another example shows how fieldwork influenced the design of the game. In order to grasp what educational gaming could be about, we started the pilot phase by talking to school pupils and more advanced students within educational programs about their experiences and expectations of gaming. They did not see teachers as relevant, and instead gaming was seen as a possibility to (re-) create their own social networks, to engage with people they could trust and relate to. Within the game, the role of expert and non-expert was given on the basis of knowing the routes and regulations of the game itself. Still, when we were introducing the pilot version in classrooms, we were able to follow how knowledge of gaming became a way to position oneself differently in the classroom. The knowledgeable pupils became the knowledgeable avatars, and this in turn created a different position for the pupil in the classroom. We realized that we needed to position the teacher within the game as well, and we started playing with the metaphor of the teacher as "the game-driver". The pupil-avatar was to be given the possibility of being involved in co-creating events and engaging with the history. This created a situation where the pupils could learn that enactment in the landscape had effects. We set out to create a specific position of teacher/game-driver that could generate events. These events could be ecological changes, hunting preparations, migration and settlement of "others" with unfamiliar rituals and hunting practices, or they could be turbulent economic changes in the stockfish and fur markets. This illustrates our point that design cannot be separated from the social, and that such a project becomes a possibility for engagement more broadly. Design, as Suchman (2002) argues, should be valued as a series of views from somewhere, and in our terms and following our notion of the material boundary metaphor in designing; it was an assembling of different knowledge practices that made this new device possible.

Another example was when fragments of the script as a material boundary metaphor appeared and were commented upon. Scripting became an assembling of research-knowledge, styles of storytelling, and what was technically possible within the game platform. The religious studies researcher, for instance, argued that the Saami myths were more open and invited a wider range of interpretations than the script did. Through this kind of negotiation, Saami mythology was discussed, but there was also more general discussion around the possibility of more open structures for storytelling than the closed structure of the linear colonial framework.

Computer games also communicate culture through communicating values (Ekeland & Kramvig, 2004). In social games like Siida, award systems can be built into the basic structure. The game industry has developed configurations over time that govern how such a system should be designed in order to provide the best acting opportunities for the players. The researchers insisted that these award patterns should be broken down. They argued that Saami mythology could provide other ways of rewarding the actions of the players as well. The argument runs as follows: technological solutions, together with the usual gaming expertise of young game-players in the West, do not allow Saami ontic to fit within the game format. One example can be given: in the Saami knowledge tradition, conflicts were solved within the Siida. In a situation when disagreement appeared, a council consisting of elders and leaders of the kin-groups involved was set. This organ was known as"norràz" and they negotiated the issue at stake in order to set a statement that the partners involved could live with. Also, a respected person could be called in; or just come into the household to cook and

do the everyday activity until the dispute was settled. The ordinary game format asked for more open combat between the players involved. These should be formatted in a recognizable script for the players. Game designers both consciously and unconsciously embed social values into games through narratives and game mechanics (Flanagan & Nissenbaum, 2007), for example by not allowing certain ritual discourses to be a part of it.

However, in the design process, the drafted scripts were re-opened for reinterpretations, and more associative openings were created. This could be called a postcolonial moment, as Verran has suggested in her studies of alternative firing regimes as understood by environmental scientists and aboriginal landowners (Verran, 2002a: 730). Such a moment might affect opening up and loosening, but importantly it increases the possibilities for cooperation while still respecting difference. It enables difference to be collectively enacted rather than ignored or obscured. Such moments are created when disparate knowledge practices abut and abrade something that is characteristic of the colonizing process. At such points, other stories with Saami ontic emerge and interrupt the performance of situated knowledge. An example might be the bear and bear hunting that has been of great importance for all the peoples of the Arctic region. Images of the bear can be found in 6000-year-old petroglyphs, in stories as well as in yoiking (the chanting tradition of the Saami), and there are around thirty bear graves dating back to around 1000 BC in Sápmi (Olsen, 2000). This was a period of extensive ritual activity and cultural consolidation, brought forward by Norse settlements in the region. The bear stories mark socialites where relationships between women and men, young and old, and structures of leadership emerge. To incorporate this story in the script also allows disparate ontics to emerge. Here the bears give themselves to the people. Women instruct men on when the hunting should start and men follow their instructions in order for the hunt to go well. The bear meat was consumed in a ceremonial situation that articulated and strengthened the community. This complexity made it a promising point of departure for connecting religion, gender, mobility, cultural tension, cooperation, trade and the use of natural resources together in different ways in the times/spaces of the game. We see the script as a material boundary metaphor that participated in moments of intervention in the designing. This idea is inspired by postcolonial science and technology studies that "challenge us to understand 'global' technoscience as a series of local economic accomplishments, each of them confused and contested" (Anderson & Adams, 2007, quoted in Suchman, 2011: 14).

Many kinds of relationships emerged during the design process; multiple versions of reality performed partial connections to other ontics. This way of conceptualizing the process is one way of learning about the non-coherent flux of forces and relations that produce a particular reality (Law, 2004:6). The social assembles the material, but the material also reassembles the social. We have also shown how the avatars went through a range of transformations in the process: from a "symbol" to an actor in a heterogeneous network, and even an actor performing a form of resistance. In practice, the avatar and the game came together. This was not because its coherence preceded the knowledge generated about it, but because the various coordination strategies involved succeed in reassembling multiple versions of reality (Law & Mol, 2002:10). Another form of social entity emerges when we situate the material boundary metaphors within a substrate of matter, making the multiplicity to emerge.

Projects as Projecting: Boundaries and Possibilities

We have shown that in the Siida project several innovation processes ran parallel to each other, and that this made collaboration an even more challenging process. Multi-stakeholder project situations imply creating routines, meeting-points and occasions for different fields of knowledge to come together. The actors in the fields are linked together in overlapping connections in the production of material boundary metaphors. The project allowed for assembling between both actors and institutions. One of the people from the game company reflected on the challenge: *"I think that Siida is both a meeting between individual actors and a meeting between institutions, and this is the problem. I think that such projects require a much more internal, a much less formal treatment – in order to talk together and understand each other. We should think about gathering this competence under one roof – in one institution, at least during parts of the development period. … In my world, knowledge is found less in individuals than in institutions."* Paradoxically, he continues: "*I link what I have learned to the organization. … It is a life-long relationship. If we didn't have that attitude, we would never have entered this project"*.

Organizations can be explained as different modes of ordering that extend through people to include technologies and organizational arrangements (Law, 1994). An organization can also become an object of designing (Suchman, 2011: 12). In our example, the actors expressed their sense that a loose coordination of the project during the pilot period led to more mutual responsibility in the remainder of it. Parallel to the project's formal organization, an informal structure was produced.

The game-production companies involved, Orgdot and later on Copyleft, had a growing portfolio of projects and the organisation expanded in relation to the areas of competence and people, involving programmers, drawers, storyboard-writers and project-leader relating to budgeting, formalization of work and different clients. The artist in Orgdot did the following reflection on the project multiple:

> We needed to set a system with a project-leader in our organization that could take on the responsibility to protect on-going innovation from systems that did not match in regard to time, resources etc. Our organization needed to employ more people, lack of time set us in a position where the openness that we started out with had to go, and we needed to set the technological solutions. This came together with more awareness of the limitation in the budget, altogether ordering device in the organization of work.

As argued by Winthereik (2010), the project shaped participants behaviour and what it was possible for them to know. The project shapes the work done, how the project was perceived and how the participants know both the world and themselves.

Technology at work made it difficult to connect the various fields of knowledge. In the production phase of the main project, the head of the company, who as the producer of the game was responsible for coordinating the knowledge built into its components, insisted that most of the communications between the fields should go through him as a leader. The existence of an authority structure shows that we were also dealing with a different assemblage, the organization. This encouraged a set of practices by established gatekeepers that informally protected the different knowledge practices and the generalizations made on their behalf. But as Verran (2002b)

shows, rather than dissolving difference, a useful sameness, and one that is good enough for a few here-and-now ideas can create openings for symmetry. We have tried to show this relational effect through using the notion of material boundary metaphors, but at the same time we wanted to keep up awareness of the different rhetorical devices that produced distancing in the organizational activities and the procedures of design work.

The investments that the individual actors made in realizing the project stretch beyond the obligations they feel as representatives of the organization to which they belong. This loyalty is mainly linked to the realization of the project. In such a process, there is a need to link the actors closer together in the different parts of designing. It is the journey itself that is seen as meaningful, clearing paths in an unknown landscape. At the same time, the actors are aware that the work feeds back to other participants and into the institutions that are involved. The Siida project was seen by the people involved as an object in which they had invested knowledge, while the structures they worked within were seen as limiting. All participants experienced the ritualistic practices as limiting to creativity and innovation. At the same time, alternative models for organizing encounters that respected both sameness and differences were insufficiently articulated. From our point of view, we see how those utterances both depend on and "change" some of the people involved.

Producing the script has been an on-going process. One person who developed the game platform noted: *"Our competence was concerned with what it was technically possible to do, so the script writer came to sit with us."* The utterance constitutes a "here" – it positions the speaker in a particular territory. It is a form of performativity that says something about what is the most relevant location. In order to continue the process, the outcomes of on-going technical tests and considerations of the game itself were built into the script. It was also revised according to what was possible or desired in terms of technical factors, gaming experience and didactic aims. This generated important dialogue and had a significant influence on the relationship between the goals of gaming and academic aims. As one person from the game development company expressed it, *"the requirements of gaming experience are bad for academic content and vice versa. If you squeeze too much academic content in, you may reduce the gaming experience."* He continued, *"I think we will see good learning games in the future. But the appearance must be developed."* The claim was that the more academic the content or didactics, the less the gaming experience with its technological or game-based concerns could take priority – something gets in the way of progress towards a new future. This means that the statement above delimits the understanding of the relationship, or how the relationship should be seen. Positioning is partly taken for granted – a form of natural rhetoric that claims: "This is simply how the world is". But the last sentence opens up an opportunity to see a limit in their work. In order to work, the design process needs to acknowledge the specificities of its place and locate itself as a multiple practice (Suchman, 2011: 2). Routinization can be seen as a factor that stabilizes the identity of an organization, whilst innovation can destabilize this identity and open up the assemblage to other possibilities.

We are suggesting that technology at work became a performance that frames the technological stories around the concepts of designing and of a 'project' (see also Law, 2004). To put it another way, *the project multiple,* as argued by Winthereik (2010: 61), comes with the means to conceptually

deal with the fragmentation that threatens to dissolve many IT projects in the public sectors and elsewhere. *The project multiple* is a way of recognizing that differences are continuously produced within and through a project. In our example, we saw how boundaries were established and how, little by little, gatekeepers made themselves felt. They kept the respective fields of knowledge pure enough so that they could expand, while other fields of knowledge were prevented from expanding into their own field.

Different reciprocal social images interacted and led to the devaluation of the Other. One of the game developers described the process as follows: *"I design instructions for the sets of characteristics that the avatars will have, for instance that they should be easy to use. What is important is to stick to an established rhetoric; they should be charming and likable without becoming too banal. There are technical requirements that need to be met, and all these aspects must be tested and tried in order to find a model that works. The interface needed to be intuitive, which means that you need to use a language that is recognizable. And recognition becomes more important than distinctiveness. The avatars are unique, they are influenced by pop culture, but they still satisfy something unique."*

Through referring to an established rhetoric that exists within the field, boundaries are erected that demarcate this field from other fields of knowledge. What this means is that the dependence on others is obscured and the technology being used becomes the most important gatekeeper for the other fields of knowledge to expand meaningfully into the design. But innovation involves making differences that disrupt particular interests. In our discussion of the designing of the avatar, we showed that precisely such an expansion did take place. The work of the material boundary metaphors showed a different assemblage than what came out of the actor's utterances. That is to say that in this case, conceptually we could not draw upon experience in any immediate sense, but we could see that what was said and done about the relationship was not the same.

Multiplicity and the enacting of different versions of reality – or ontics – are necessary in the process of creating a new device (Verran, 2002a). Such tensions and multiplicities will appear and need to be uttered as a part of innovation. The concerns of social research grew into the technology at the same time that the technology became available for the social researchers in ways that make it possible for us to perform it. Technology has to be in motion for it to work (Law & Singleton, 2000); it does not work by insisting on rigidity and translating a single order. It has to change shape through a process of interacting, negotiation and multiplicity, where various modes of ordering come together. O´ Donell (2011) shows in his work following the production of Spiderman Three´s development, that the industries in the so-called New Economy are dependent upon new modes of collaborative practice. However, structural conditions can undercut creative collaborative practice. In our case the complex assemblages of human and non-human actors in the designing process were telling us that we agree that making practice is the central concern. The design cannot be separated from the social localization of design, and the organizational culture of the designers has to be brought more clearly into the various coordination strategies, not merely as an actor's utterance of how ordering works.

Conclusion: Assembling Multiple Others through the Design Process

We opened this article by arguing that Siida could be considered as an assemblage

constituted through the design project and that all the knowledge practices involved were tied to their location. When we reconsidered the pilot report, we found that it had incorporated a series of standardized forms of interactions, and furthermore that these had created disconcertment among some of the actors. We had to find strategies for working their disparate knowledge practices together. In the main project, we found that the notion of assemblage helped us to understand a range of human and non-human actors, systems, technologies and practices that make up the game, and we saw that design proceeds through multiple collaborations. The notion of the material boundary metaphor became a methodological tool we used to see how partial connection is performed in designing. The material boundary metaphor had divergent meanings for the implicated actors, but it was a metaphor that pointed to the sameness required for working together. Multiple versions of realities were performed in partial connection to other ontics, and this created associative openings. These allowed us to work together toward visions of what Siida could become. This happened due to the plasticity of the material boundary metaphor at work in located situations.

More generally we suggest that the notion of the material boundary metaphor opens up the possibility of ontic in the work of designing an online game. In this case, it helped us to show how a range of different Siidas were being assembled as the design progressed. It was not a single project that emerged; rather, as we followed the paths of the design process we could see that Siida, the game, was made real as quite a heterogeneous assemblage – as a project multiple. Through the main project, entities that had started out as "symbols" were opened up and given new life, where non-human actors also made agencies as they assemble human performativity. Through internal negotiation and in a network of actors that performed a particular knowledge practice, utterances, stories and materiality were produced and connected with each other. In this process, we had some postcolonial moments that interrupted the existing relationships between the actors. In the case of the avatar, we showed how the avatar changed from a stereotype of a Saami figure in the pilot report to a more open Arctic-looking figure in the main project, all the while of course remaining an imaginary actor in a historical game designed for the future. The avatar from the pilot report thus effected an opening up and enabling of difference to be collectively enacted.

The design activities arranged people and objects into sets of relationships, with the process of both connecting and separating actors in relation to the task. Innovation in general involves making differences that disrupt particular positions and interests. What we found was that the limits of designing were established in the procedural structures of our organizational activities, where technology at one point became a particularly privileged narrative. The project acted as if the work of designing was a singular vision, and this meant that any assemblages not already at work were not recognizable and as a result silenced. However, relations between actors and the investments made by those involved kept the project together, even when one of the companies that we had worked with withdrew from production. The beta-version came about as an effect of these relationships, even at a moment where the original contracts were no longer part of the project and could hardly be conceived as "actors" shaping it. The connections and separations produced through the process indicate that socio-technological innovation requires flexible organization and some ordering device, that is, a culture where different ontics are seen as partial

and imperfect knowing and yet are more able to see together to find a better solution.

Clearing paths in unknown terrain is not possible without trial and error, or without tensions. Our experience of participating in the creation of a research-based digital educational game shows that we had to cross over into new land in many new areas. One of the commissioners said that *"we would like to show that ITU also dares to back things that are cutting-edge, with certain risks attached … The process has been immensely educational and incredibly good fun. I think we should continue even if there has been much blood and tears. Really cool! [Otherwise] as so often, we might end up following standardized patterns in what we deliver."* In writing this partial compilation we, the researchers, have considered yet again the paths – in the forest, across the plains – between people. Perhaps in these assemblages of actors we may find new possibilities to expand our being in relation to each other and take up the challenge of games together, creating new devices that opt for a modest symmetry.

Notes

1 Statements taken from application to ITU and Copyleft's memo on tasks in Siida.

2 Kautokeino hat – in Saami called the hat of the four winds due to its star shaped form – is today used as head clothing for men as part of the Saami, but area specific, national costume. This costume is called gákti and varies from one area to the next in Sápmi. Also, it has undergone substantial changes over time and has, even in just the documented part of history, incorporated inspiration, new colour schemes, qualities of fabric, etc., in relation to the movement of people and things in the Arctic area in different periods of time.

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