

# Building a NGII: Balancing Between Infrastructure and Innovation

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## ABSTRACT

A multitude of studies has been published on how National Geo Information Infrastructures (NGII), also known as Spatial Data Infrastructures (SDI), should be designed, set up and monitored. Scientific research on day-to-day experiences, on what is really happening in NGII-projects is hard to find.

We propose a narrative approach to elicit sensemaking processes in order to get a better understanding of NGII projects. An in-depth description and analysis on the development of the Dutch Geoportal project is given, which was funded by the Space for Geoinformation Program (SGI), meant to be part of the Dutch NGII. Intensive research was carried out through observing project meetings and conferences, and interviewing key persons, both within and outside the project environment. Out of the research data we identified different kinds of narratives, representing thinking patterns among project participants.

Our ethnographic research elicits day-to-day struggles with project goals, technology, and infrastructure. We found that project participants find it hard to distinguish between requirements for infrastructure and innovation. While infrastructures need stable environments with harsh standardization that will last, innovation challenges that with new developments, reaching for something new, the uncontested terrain. We believe that this discrepancy is a cause for serious redefinitions of SDI project goals, assessment rules and results.

**Keywords:** NGII, infrastructure, innovation, organization, narrative approach

## 1. INTRODUCTION

There is a worldwide tendency to create facilities on a National scale to collect and disseminate geoinformation (Crompvoets 2006). Geoinformation, which is made from spatial data with reference to a physical location, is increasingly used in organizations, governments and by the general public. It is mostly managed within organizations with Geographical Information Systems (GIS's) and between government organizations through National Geo Information Infrastructures (NGIIs) (Rajabifard and Williamson 2001; Nebert 2004; de Bree and Rajabifard 2005; Masser 2005).

When setting up programs to establish NGIIs, policy advisors take organizational aspects seriously, but do not treat them as manageable phenomena (Georgiadou, Puri et al. 2005; Crompvoets, Rajabifard et al. 2008). Technical aspects are regarded as crucial (Nebert 2004). Implementers seem to overlook organizational consequences, denying the relationship between organizational change and NGII implementation (Koerten 2008). Therefore, organizational structures, modes of cooperation and work relations are no subjects for research in NGII implementation (Georgiadou, Rodriguez-Pabón et al. 2006).

However, while technological developments are still regarded as crucial, implementers are more inclined to take organizational aspects in NGII development into account, culminating in

design rules, borrowed from political science, economy, and management science (van den Toorn and de Man 2000; de Man 2003; Koerten 2007). Practitioners still point at difficulties with infrastructure development, mostly cast into projects, of which we still have little knowledge concerning members' lived experience (Hodgson and Cicmil 2006; Van Marrewijk and Veenswijk 2006)).

We propose an alternative to the development of design rules and to look into implementation processes to find out what is really happening in NGIIs. An understanding of daily practice might bring knowledge on NGII implementation further. We focus on what is told about NGII in meetings, interviews and policy documents, culminating in narratives. The research question guiding this paper is: how can narrative analysis help to improve NGII-implementation? Subsequent questions are: how do technological and organizational aspects interact with each other? How are goals and results perceived and do they change over the project?

This paper offers an in-depth ethnographic case study on a Dutch NGII implementation project called Geoportals using a narrative approach. The project was meant to realize a part of the Dutch NGII, by disclosing governmental geoinformation in a thematically organized way. Our research findings demonstrate that the initial project goal, building an infrastructure, gradually changed towards knowledge creation for innovations for developing the NGII.

We will start with a brief description of theoretical assumptions under girding the narrative way of research, followed by an account of the research methodology. Then, an analysis in terms of the theory will be given. Finally, some summarizing and concluding remarks are made.

## **2. THE NARRATIVE APPROACH TO RESEARCH**

This ethnographically oriented research on inter-organizational change projects starts from a discursive point of view (Grant, Hardy et al. 2004). Habermas distinguished the system world from the communicative life world (Habermas 1987). He conceptualized the system as dominating individuals, and the life world pointing at the individual social actor producing meaning of the organization through textual arrangements and editing processes (Gabriel 2000; Fairclough 2005).

Projects have become a principal way of working, creating arenas within and between organizations where change becomes enacted (Habermas 1987; Nocker 2006). Therefore, projects are not only product-creating systems (e.g., building a geoinformation infrastructure), but also vehicles for organizational and social change (e.g. creating modes of cooperation) (Winter, Smith et al. 2006). A narrative approach enables us to understand how in NGII development different perspectives are used to identify how meaning is negotiated, shared and contested. Meaning is shaping actors' interpretations and social practices, seen as both sensemaking and sense giving devices (Søderberg, 2003). Through recognizing the existence of different narratives we can move beyond the dominant discourse and reconstruct everyday processes of negotiating meaning among organizational actors (Boje 1995; Czarniawska-Joerges 1997; Gabriel 2004; Brown, Stacey et al. 2008).

Instead of seeing organizations as static, we treat them as open-ended meaning networks with fluid structures and permeable boundaries, with cultural 'settings' only as a temporal outcome (Habermas 1987; Czarniawska-Joerges 1998). Deep-level, partly non-conscious meanings, ideas and symbolism may develop across different social groupings, by which even "new rules of the game" may be created, contested, appropriated or diffused. (Alvesson 2002; Jeannot 2006).

Actors are always in search of a clear, overall, sense-making picture (Verduijn 2007). If necessary, missing holes will be filled with fantasies acting like experiences, in order to get a complete picture (Ricoeur 1973; Bruner 1991). Narratives are the result of sensemaking processes, bringing (micro) stories into a meaningful whole by framing (sequentially, cyclic, etc.) (Boje 2001). Stories can be oral, written or filmed, fictional or nonfunctional (Verduijn 2007).

### **3. METHOD**

In this section, some information on the context of the Geoportal project will be provided, as well as an explanation of the ethnographic research design.

#### **3.1 Context**

The National Initiative for Innovation Stimulation commenced the Space for Geo information program (*Ruimte voor Geoinformatie*, SGI), running from early 2005 until the end of 2008. The SGI program gave grants to projects dealing with geoinformation, meant to realize a part of the Dutch National Geo Information Infrastructure (NGII). Geodata was regarded as a crude product that should be thematically disclosed to obtain geoinformation, of which society as a whole should benefit. Projects received 60% of its funding from the SGI initiative, the participating organizations were supposed to supply the remaining 40%. Out of this SGI-program, the Geoportal project emerged, bringing together 13 organizations in the field of geoinformation working on a network of geoportals for the disclosure of geodata.

At the multi-faceted SGI-program palette, geoportals was one of the larger projects, and was mentioned often by program officials as a prestigious key-project. Projects were evaluated on their ability of bringing closer or contributing to the Dutch NGII. Geoportals was aimed at the overall goal of the program: disclosing geodata from different sources to produce geoinformation.

#### **3.2 Research design**

One researcher performed ethnographic research by monitoring the project during its course. For that purpose, meetings by the project committee, annual working conferences and brainstorm sessions were observed. A few representatives of the participating organizations formed a core team. They used to convene in regular meetings, mostly on a monthly basis, dealing with management issues and exchanging ideas. Working conferences were open for professionals within the geoinformation-sector and had the purpose of project promotion. Brainstorm sessions, held by the project team in the first phase of the project, were meant to establish a clear and univocal view within the project committee.

Apart from the observations, interviews were conducted with key-persons within the project during startup and closing of the project. Also relevant documents and some video footage were analyzed. Ethnographers have to be convincing in authenticity, plausibility and critical analysis (Golden-Biddle and Locke 1993). We followed writing conventions developed by Watson, and extended by Duijnhoven on transferring field notes into convincing, yet authentic texts (Watson 2000; Duijnhoven 2008).

### **4. ANALYSIS**

In this section a close description, aimed at narrative analysis is given. As the project developed, three phases can be identified.

#### **4.1 Getting started**

The SGI program started in 2002, with an unarticulated idea of stimulating innovation to boost geoinformation sharing. The program staff brought together organizations in the GI-field to make

goals more concrete. The result was a fancy brochure, with a program-outline by a consortium formed by 10 universities, 20 research institutes, 60 companies, 40 governmental bodies and 30 geo-informationproducers (RAVI 2003). It was argued that to develop convincing policies, government was needed complex information about a complexing society. To make complex information manageable, it should be orderered spatially as geoinformation, disclosed by a National Geo Information Infrastructure (NGII). Bottomline was to make geoinformation available in a structured manner, being disseminated independently from individual organizations.

In order to harvest ideas for future projects, SGI organized 'broking and bargaining days', on which representatives of organizations from the GI-sector were invited to generate project ideas. There the concept of Geoportals emerged. Some informant's observations:

'SGI mobilized the field. They organized broking and bargaining days in order to get rough ideas. Some 25 ideas were identified as potentially successful. In the end, these ideas were connected to organizations; it was just one big dating show. It became obvious that some central portal facility was needed, and that our organization should play a role in its development.'

'I remember how Geoportals emerged. The idea behind broking and bargaining-events, organized by SGI, was that through discussion among representatives of geo information organizations, ideas for concrete projects would pop up. During one of those meetings, the Geoportal concept just came out of a plenary discussion. Then the moderator asked what organizations were willing to participate. Representatives of interested organizations raised their hand, as I did too. So, all of a sudden I was an initiating member of an instantly formed club of enthusiastic people that wanted to disclose geoinformation through portals.'

'That the overarching concept of Geoportals should be *liberty united*, was obvious from the outset. A central, top-down, organization was totally out of the question. The ideal was a network of portals of different nature, working together with a minimum set of rules.'

Discussants saw the rudimentary concept of Geoportals as a collective idea in need for development. The total of 30 organizations that were willing to participate gradually reduced to 13. In October 2002, even before the SGI program brochure was published, representatives of these 13 organizations made an initial proposal. In this initial program, thematically categorized portals according to colors were envisioned: red for built environment, green for nature and agriculture, brown for subsurface, etc. (Schmidt and Nieuwenhuis 2002).

After initial submission in 2002, a rewriting process started, in which the project got more focus. The proposal that received financing brought the Geoportal concept down to three key questions, translated and specified into fixed project goals (Hoogerwerf 2005). The project itself was structured through dividing it up into work packages like 'Geoportal framework', 'Demonstrators', and 'Marketing and Communication'.

In early minutes of project meetings, clear notions can be found on how data should be distributed. All processes for disclosure, searching, diffusion, and payment, should ideally be web-based. How all the different data sources should be connected was not a matter of discussion. The first rudimentary description of the geoportal framework echoes a static image: it should be based on evidence based technology and standards and a fixed notion of architecture (Hoogerwerf and Vermeij 2005).

While the project goals were stated in a clear and unambiguous way, the representatives of the participating organizations showed doubts about how to proceed when they met each other in regular meetings. They were uncertain about financing and reporting procedures towards SGI, but even more about the essence of the project. Now the project was about to start, representatives felt that definitions were needed about what a portal should look like, how users

should be reached and how it was supposed to be set up technology-wise. A typical discussion in a meeting of representatives would go like this:

A: 'If we want to set up a proper Geoportal, we need to be clear about standards. It is obvious that we use the most recent and commonly used standards. We are not going to use any standard that has not been accepted by the community, or that has not proved to be useful.'

B: 'I agree on that. If nobody objects, we proceed to the next topic, and that is user-orientation. We have to be demand driven in order to prevent us from making the same mistakes they made in the NCGI project. So how can we be demand driven?'

C: 'First and foremost we need to disclose our data in a way that it will be findable. Furthermore, we need to present it in a format that can be read by the user. So, we need to use the proper standards.'

B: 'I agree. We need to use proper standards, the ones that are widely accepted.'

A: 'Now we agreed upon to settle the standards issue, we are discussing standards again.'

The creed of Geoportals was 'liberty united', sustaining that it was seen as a network of portals, established by organizations, each with its own autonomy, and kept together with minimal rules. Defending this view on the essence of Geoportals, it was often explained as a reaction to a former project, the National Clearinghouse Geoinformation (NCGI). The feeling was that NCGI had failed through central, top-down enforcement of detailed standards and work procedures. Organizations were not inclined to comply with harsh rules on a voluntary basis. NCGI was seen as not have any impact. According to the Geoportals core team, the failure of NCGI should not be repeated. As a reaction, they got together as a small group of motivated organizations to connect them with a minimum of mutually agreed standards.

While Geoportals was sketched in organizational terms, discussions on how to proceed would always come down to technical matters. Standardization was considered as crucial, followed by the question whether the data was findable enough. The bottom line was that, above anything else, technological standardization should be settled properly. Technological matters were dominating discussions:

A: 'Technology is not really a problem anymore. We can build everything we want without any limit. All the techniques needed are at our disposal.'

B: 'That's right, the things that do matter are organizational aspects. Look at the US-example of Geospatial One Stop. They just do it: American government agencies put everything they have on the web, unrestrictive.'

C: 'But its quality is doubtful at best, they don't guarantee its accuracy. I wonder if anybody actually uses it.'

A: 'If we follow the example of Geospatial One Stop, than it looks like NCGI. We have to do better than that.'

B: 'Just use the right standards. That is of paramount importance. The architecture we have developed is perfectly equipped to set up a network.'

A: 'If we stick to proven technology and standards, nothing can go wrong.'

B: 'But what is that, which standard is proven, which standard is commonly used, which one really works?'

C: 'Here we go again!'

The core team, formed by representatives of a few major participating organizations, tried to tackle the experienced problems by calling together the project team for a two-day brainstorm session in a remote countryside hotel in November 2005. The intention was to develop a strategy. Technology and standardization issues were declared to be settled, but still played a role, while the intention was to develop a user driven approach. The session program mentioned a meeting with a public relations consultant and the question how to bring in more user-drivenness into the project. User-orientation was extensively discussed during that session, eventually leading to a 'manifesto': "able to find and allowed to use", on which the team was very proud.

The upcoming working conference, in which the project was presented to the GI-community in December 2005, was also pressing. The feeling was that if nothing tangible could be presented there, it would be better to cancel it. After some deliberations it was agreed that a rudimentary version of the Red Portal should be demonstrated.

At this conference day, December 2005, the Geoportal project had its initiation before a GI audience. The core team was determined, yet also a bit insecure, to make a convincing statement, by showing that the project was user driven and was doing the right thing technology wise. The audience, members of the GI-community, familiar with SGI and its projects, knew about the existence of the Geoportal project, but was unaware of its details. It was sheer curiosity that brought 50 GI professionals together.

In his introduction, the scientific director of SGI signified the importance of Geoportals for SGI, proclaiming it a key-project. Then, the core team gave a presentation about the demand-drivenness of the project, elucidating the 'Manifesto'. However, while held important by the project team, it hardly moved the public. A demonstration of a rudimentary version of the Red Portal website with built environment data, however, had an astonishing effect. What the Geoportal team saw as window dressing was the very thing persuading the audience. It appeared in discussions that participants were convinced that the Geoportal project was the key project of SGI, technically well managed and going to make a difference. The Core team of Geoportals celebrated that day as a success.

#### **4.2 Trying to reduce uncertainty**

The project team carried on with project meetings, on a fixed day of the month, in a centrally situated venue in a building of one of the participating organizations. The agenda was devoted to management trivia in the morning and discussions prepared by a core team member or an external speaker in the afternoon. However, existential discussions already emerged during morning sessions and continued over lunch, meaning that the whole day was devoted to strategy. However, a research paper written by project members to convince European peers, reflected confidence (Zevenbergen, Hoogerwerf et al. 2006).

As an infrastructure, Geoportals had to provide all different kinds of data, to be delivered to the professional user who was able to make sense out of it. But also the general public was seen as a potential user, meaning that instead of just disclosing the data, software services had to be developed to integrate, harmonize and present data. Existing examples of disclosure of geodata via a website were reviewed, convincing project members of difficulties and flaws of bringing together different sources.

Services to harmonize and present data were seen as essential to Geoportals, they underscored the user orientation of the project, which was communicated to the GI-community. The core team launched the example of a beer brewer in need for geo information on finding a new location for a brewing facility. In all presentations and promoting material, even in an SGI-promotion film, this example, connecting different processes in public organizations into one application was prominent (van de Laak 2007).

User orientation generated also interest in legal aspects and digital rights management. A researcher, affiliated with Geoportals, translated a model to regulate copyrights on the Internet, for application in the geoinformation field. Soon that model, regulating legal and economic aspects of geoinformation, was treated as essential for Geoportals. However important, it was also seen as separate, unlike technological issues. Technology was held as dynamic, the

access model was regarded as static. Further development of the model was embedded in another SGI project, moving beyond control of the core team.

At the end of 2006, the core team started to feel discomfited by the lack of steering capacity at SGI. While SGI saw Geoportals as the core project of the program, the core team thought SGI should provide an overarching framework. As SGI was seen as the custodian of the National Geo Information Infrastructure (NGII), a serious discussion among project participants was devoted to this topic:

A: 'We are supposed to work on NGII. For SGI, Geoportals is considered as focal, but they don't tell anything about guidelines we should follow or how to connect to other projects that are part of the NGII.'

B: 'They are talking about a test bed for NGII, but is NGII only a test bed than? Are we supposed to deliver something that is actually working?'

C: 'We are certainly working on our data viewer, but to what standards should it comply? Are there any organizations that are going to use it?'

A: 'They say that a new GI-coordinating organization is in the making, yet another organization that is supposed to organize something. We need guidelines and all they do is establish a new organization. Does not sound as coordination to me!'

D: 'I think that as the Geoportal team we should take a stand and do what SGI refuses: take the lead!'

The core team felt not to be supported by SGI. Until then, SGI was seen as the keeper of the National Geoinformation Infrastructure (NGII), of which Geoportal was a part. At the end of 2006, SGI published an article in a leading professional magazine with the provocative title: "Where to with the Dutch Geo Information Infrastructure?" (Bregt and Meerkerk 2006). It invoked discussion, but made the core team feel SGI had no strategy.

Geoportals concentrated on the work to be done: new services had to be developed with new software. Choices had to be made on what technology to use and what standards to apply. Core team members, representing three government supported knowledge institutions and a software company, felt responsible for this part of the project and took up the challenge to draw a framework and to organize software development. A participating engineering firm also did some work, but hardly took part in any conceptualizing, organizing or management activities.

During the software development process, the core team got together on a weekly basis to coordinate software development, which was done by software engineers from their own organizations. In spring 2007, efforts resulted in a data viewer, a software device designated to get geodata from different sources to be put on a computer screen. The Geoportals core team, being enthusiastic about it, saw it as a requirement for bringing the ultimate goal, a system of geoportals, closer towards its accomplishment.

While celebrating this achievement, participants felt that the newly developed data viewer was already starting to be outdated by the time it was ready to be used. But through new available technology, software engineers were able to develop even more sophisticated viewers. So, while already having a working product, the development process went on with enthusiastic software development coordinators. Working with the newest technologies, they gave the impression that these were ordinary developments, that there always is new technology to explore and to apply.

#### **4.3 Towards judgment day**

In 2007, the Geoportal project was on track as far as software development was concerned, but the core team was starting to get downright annoyed because it was felt that the initial goal,

sharing geoinformation, was getting out of reach. In the project team meeting in April 2007 a discussion on that was initiated by two core team members, trying to create a breakthrough:

'It is terribly sad that we cannot build on the achievements of SGI. It looks like management does not recognize what it is all about. In the Netherlands we have an abundance of geodata, distinguished scholars, high GIS penetration, a vast and schooled workforce and lots of knowledge exchange networks. Perfect circumstances for great ideas. But guess what? We keep on chatting.'

Nobody seemed to be in charge developing the NGII. Decision makers were depicted as abstract thinkers with no practical knowledge. A breakthrough was needed, but the appraisal of a SGI promotional conference, held in March 2007, did not show confidence:

A: 'I am sad to say that real sharing of geo information is further away then ever. We just have had the SGI conference in Rotterdam. It lacked any ambition. The bottom line was: 'the NGII has to be developed, but lets move on as we did'. That's not the way to get it done.'

B: 'It was a convention of the same people that you see all the time at such events, "the usual suspects" were doing their ritual thing.'

C: 'It was like being in some religious rally, people celebrating and praising something of which we all have a different image.'

B: 'It is a paradoxical situation. When we need a breakthrough, surprise, surprise, nobody wants to change, we keep on doing the way we did, nothing really changes.'

C: 'Everybody talks about the costs of NGII, the benefits are not mentioned.'

A: 'NGII will be adding value, that's the raison d' être. If we only want an NGII for crisis management and fighting terrorism, we're on the wrong track.'

Being uncertain, Geoportals was considered successful because it offered technical solutions. This technology only had to be brought to a meaningful whole and the NGII was born, but failing management seemed to obstruct that. Perceptions of the role of Geoportals started to change:

'It is perfectly clear that it was unattainable to build an infrastructure. Just look at the budget we had for this project: it was definitely insufficient. Our job was to deliver building blocks, to innovate for the sake of a NGII.'

'We are good at the technological aspects. So if they ask us for such a project, we will handle technology. Without any guidance from SGI, it is impossible to develop an NGII. What we can offer for a future NGII is, best practices and software tools. We form a community for NGII development'

Another working conference was organized in November 2007 with a striking theme: just do it. External experts were asked to focus on financial, legal, and organizational, aspects while Geoportal project members were keen on presenting the technical side. The message in workshops was that new software applications, as developed in Geoportals, were fully capable of integrating geodata from different sources. This message was symbolized by using Lego building blocks representing Geodata building blocks, to be put together in any possible way.

Now the end was near, the project team wanted to deliver results and make them available for the future. Slightly but steady, the project goals were redefined. The obligation to make tangible products changed towards seeing themselves as a "community of practice". The image of developing building blocks for an NGII changed towards Geoportals as a knowledge-creating project. The atmosphere changed from distress to euphoria. However, one of the core team members, being skeptical, noticed it as "expectation management".

It was felt that positive results should sustain in the GI community, for instance in a research paper (Zevenbergen, Bulens et al. 2009). A new policy coordinating organization, first thought of

as a cover-up for the impotence of a sector, was now eligible for securing the innovative achievements of Geoportals for the future. The image of SGI changed accordingly; from a temporal financing source, only asking for auditors' certificates in return, towards a knowledge-boosting program that should be continued.

At the closing conference in December 2008, there was confidence about results. The highest civil servant responsible for Geoinformation in the ministry of Environment was keynote speaker, addressing 150 people on a fancy location. The inaccessibility of geoinformation was presented in a specially produced film as an ongoing project, suggesting that still a lot of work had to be done. Software applications were presented as stepping-stones in an ongoing process invoking a lot of interest in newly developed techniques. A new website with a new name ('Carta Fabrica') was launched where the achievements of Geoportals were made available. Both the core team and the audience were optimistic about the future.

## **5. SUMMARY, DISCUSSION AND CONCLUSION**

By describing narratives used in the Geoportal project, we have the building blocks of an analysis available. Narratives tell us how developments and practices were experienced during the course of events.

Geoportals was conceived in the Dutch GI community, with SGI as an enabling organization. It was expected that the Geoportal project should report to the wider GI community, as well as participants within Geoportals were constantly looking for approval.

The project team saw SGI as a temporal organization, being part of the GI community, sustaining the Geoportal concept through funding with money earmarked for the GI community. It made the project team feel cautious, responsible and humble. SGI brought the GI community together round a financing source, forcing individual organizations to cooperate with each other in order to be eligible for getting their ideas funded. The Geoportals network concept, already present in GI community thinking, materialized through SGI.

Initially, Geoportals was developed to build an infrastructure to serve societal needs. These needs were converted into user profiles with different demands. Being dissatisfied with not receiving guidelines for the overarching strategy, project participants started to develop software applications. Being in the vanguard of ever changing technology, the idea of building an infrastructure was getting out of reach. Consequently, goals shifted towards offering a toolbox, which in turn changed into the image of an innovation-generating project.

### **5.1 Narratives of stability and change**

The narrative of technological progress forced project participants to look ahead. Every organization in the GI-community was experiencing the same pressure of technological innovation causing insecurity. The whole sector stucked together, looking at each other and waiting for others to make the first move.

Geoportals project members, disjointed from their own organizations, jointly made plans for new applications, unwittingly ensuring that no individual or organization could be blamed for failure. The Geoportal project was supposed to deliver an infrastructure beneficial to the whole GI sector.

In a world with a pressing and increasing turnover of technological innovations, stability is required for creating reliable infrastructures. These two competing narratives of stability and change were struggling for dominance.

An infrastructure is a fixed, predictable, stable, unambiguous, and ubiquitous facility that users take as it comes (Edwards, Jackson et al. 2007). Focusing on developing a standardized infrastructure holds the narrative of stability, as it was prominent in the initial project proposal of Geoportals. The difficulty of standardization was already recognized in its subtitle: liberty united. Harsh standardization was feared and felt as hard to implement, so a limited, 'light' version of standards was proposed.

The Red Portal, as it was presented on the first working conference, was hailed as innovative, not as a piece of infrastructure. Newly developed software, already obsolete at the day of completion, was not seen as a problem. The average GI professional has confidence in tomorrow's technology, because it will solve the problems encountered today. So, while the narrative of innovation remained prominent, a narrative of stability for establishing an infrastructure did not emerge.

When SGI started to stress their core message of innovation, the core team of Geoportals was more than ready to live up to that call. The project was reframed into a knowledge-generating endeavor, in line with the storyboard of technological progress. Knowing that ultimately the GI community judged the project upon its innovative qualities, it presented state of the art software as tangible result of four years Geoportal project.

## **5.2 Conclusion**

Delivering infrastructures seems to have two contradicting aspects (Hanseth, Monteiro et al. 1996). There is a narrative of change, giving voice to the urge of always wanting to work with the newest technology. On the other hand, a narrative of stability makes an infrastructure useful by being predictable and stable. These two narratives seem to fight for attention.

In the Geoportal project, under the supervision of a program aimed at innovation, the change narrative is dominant, having only an interest in infrastructure development, hampering the actual use of a stable, recognizable infrastructure.

Both narratives align with the basic stability/change contradiction (Douglas 1986). The confrontation of these two differing narratives is not uncommon to the public sector. It has been coined as the innovation paradox, appearing in large projects where a fixed infrastructure has to be delivered in an unstable environment (Veenswijk 2006).

It is suggested by Van Marrewijk et.al. to focus at project designs in the light of cultural settings when problems with the construction of infrastructures emerge (Van Marrewijk, Clegg et al. 2008). However, here there is more at stake. A GI community, seeming to be preoccupied with innovation, desperately needs an infrastructure that will be used. An informant suggested that infrastructures always innovate and should be regarded as "moving targets". However, in order to be used, infrastructures also need to be stable. The sector as a whole has to find an equilibrium between stability and change on that matter. Now that these driving forces are identified, a breakthrough is within reach.

## **REFERENCES**

- Alvesson, M. (2002). Understanding Organizational Culture. London, Sage Publications.
- Boje, D. (1995). "Stories of the Storytelling Organization: a Postmodern Analysis of Disney as "Tamara-Land"." Academy of Management Journal 38(4): 997-1035.
- Boje, D. (2001). Narrative Methods for Organizational and Communication Research. London, Sage Publications Ltd.

- Bregt, A. and J. Meerkerk (2006). "Waarheen met de nationale geo-informatie infrastructuur?" Geo-info(7/8): 296-301.
- Brown, A., P. Stacey, et al. (2008). "Making sense of sensemaking narratives." Human Relations 6(8): 1035-1062.
- Bruner, J. (1991). "The Narrative construction of Reality." Critical Inquiry 18: 1-21.
- Crompvoets, J. (2006). National Spatial Data Clearinghouses, Worldwide development and Impact. Wageningen, Wageningen Universiteit.
- Crompvoets, J., A. Rajabifard, et al., Eds. (2008). A Multi-View Framework to Assess SDIs. Melbourne, Au, Space for Geo-Information (RGI), Wageningen University and Centre for SDIs and Land Administration, Department of Geomatics, The University of Melbourne.
- Czarniawska-Joerges, B. (1997). Narrating the Organization, Dramas of Institutional Identities. Chicago IL, The University of Chicago Press.
- Czarniawska-Joerges, B. (1998). A Narrative Approach to Organization Studies. Thousand Oaks CA, Sage Publications Inc.
- De Bree, F. and A. Rajabifard (2005). "Involving Users in the Process of Using and Sharing Geo-information within the Context of SDI Initiatives." From Pharaohs to Geoinformatics, FIG Working week.
- De Man, E. (2003). "Cultural and Institutional conditions for Using Geographic Information; Access and Participation." URISA Journal 15(APA I): 29-33.
- Douglas, M. (1986). How Institutions Think. Syracuse, Syracuse University Press.
- Duijnhoven, H. (2008). Tales of Security Practices within Spanish and Dutch Railway Operators: Translation, transformation or transgression? 8th International Conference on Organizational Discourse 2008., London UK.
- Edwards, P., S. Jackson, et al. (2007). Understanding Infrastructure: Dynamics, Tensions, and Design; Report of a Workshop on "History & Theory of Infrastructure: Lessons for New Scientific Cyberinfrastructures.
- Fairclough, N. (2005). "Discourse Analysis in Organization studies: the Case for Critical Realism." Organization Studies 26(6): 915-939.
- Gabriel, Y. (2000). Storytelling in Organizations, Facts, Fictions, and Fantasies. Oxford UK, Oxford University Press.
- Gabriel, Y. (2004). Narratives, Stories and Texts. The Sage Handbook of Organizational Discourse. D. Grant, C. Hardy, C. Oswick and L. Putnam. Thousand Oaks CA, Sage Publications Inc.: 61- 77.
- Georgiadou, Y., S. K. Puri, et al. (2005). "Towards a potential research agenda to guide the implementation of Spatial Data Infrastructures—A case study from India." International Journal of Geographical Information Science 19(10): 1113-1130.
- Georgiadou, Y., O. Rodriguez-Pabón, et al. (2006). "Spatial Data Infrastructure (SDI) and E-governance: A Quest For Appropriate Evaluation Approaches." URISA Journal 18(2): 43-55.
- Golden-Biddle, K. and K. Locke (1993). "Appealing work: An Investigation of How Ethnographic Texts Convince." Organization Science 4(4): 595-616.
- Grant, D., C. Hardy, et al., Eds. (2004). Introduction: Organizational Discourse: Exploring the Field. The Sage Handbook of Organizational Discourse. Thousand Oaks CA, Sage Publications Inc.
- Habermas, J. (1987). The Theory of Communicative Action Vol. 2 Lifeworld and System. Boston MA, Beacon Press.
- Hanseth, O., E. Monteiro, et al. (1996). "Developing Information Infrastructure: The Tension Between Standardization and Flexibility." Science, Technology & Human Values 21(4): 407-426.
- Hodgson, D. and S. Cicmil, Eds. (2006). Making Projects Critical. Management, Work and Organisations. New York, Palgrave Macmillan.

- Hoogerwerf, M. (2005). GeoPortal Network - Liberty United. Wageningen.
- Hoogerwerf, M. and B. Vermeij (2005). Geoportal Framework version 0.2 (Geoloketten Raamwerk versie 0.2): 8.
- Jeannot, G. (2006). "Diffusing values or adjusting practices? A review of research on French public utilities." International Journal of Public Sector Management 19(6): 598-608.
- Koerten, H. (2007). Blazing the trail or follow the Yellow Brick Road? On Geoinformation and Organizing Theory. GI Days - Young researchers Forum, 10-12 september 2007. F. Probst and C. Kessler. Münster, Germany, Institut für Geoinformatik, Universität Münster: 85-104.
- Koerten, H. (2008). Assessing the Organisational Aspects of SDI: Metaphors Matter. A Multi-View Framework to Assess SDIs. J. Cromptoets, A. Rajabifard, B. Van Loenen and T. Delgado. Melbourne: 235-254.
- Masser, I. (2005). GIS Worlds: Creating Spatial Data Infrastructures. Redlands CA, ESRI Press.
- Nebert, D. (2004). The SDI Cookbook, <http://www.gsdi.org/pubs/cookbook/>.
- Nocker, M. (2006). The contested object: on projects as emergent spaces. Making Projects Critical. D. Hodgson and S. Cicmil. New York, Palgrave MacMillan: 132-154.
- Rajabifard, A. and I. Williamson (2001). Spatial Data Infrastructures: Concept, SDI Hierarchy and Future Directions. Geomatics '80, Tehran, Iran.
- RAVI (2003). Space for Geo-information BSIK knowledge project proposal. Amersfoort, RAVI.
- Ricoeur, P. (1973). "The Model of the Text: Meaningful Action Considered as Text." New Literary Society 5: 91-120.
- Schmidt, A. and G. Nieuwenhuis (2002). Geoportals 'Liberty United', Project proposal for Space for Geo Information. Wageningen.
- Van de Laak, D. (2007). DVD: Alles draait om geo. Netherlands, Ruimte voor Geo-Informatie.
- Van den Toorn, W. and E. de Man (2000). Anticipating cultural factors of GDI. Geospatial Data Infrastructure: Concepts, cases and good practice. R. Groot and J. McLaughlin. Oxford, Oxford University Press.
- Van Marrewijk, A., S. Clegg, et al. (2008). "Managing public-private megaprojects: Paradoxes, complexity, and project design." International Journal of Project Management 26: 591-600.
- Van Marrewijk, A. and M. Veenswijk (2006). The Culture of Project Management; Understanding Daily Life in Complex Megaprojects. Harlow UK, Pearson education Limited.
- Veenswijk, M. (2006). "Surviving the Innovation Paradox: the Case of Megaproject X." The Innovation Journal: The Public sector Innovation Journal 11(2): article 6, pp. 1-14.
- Verduijn, K. (2007). Tales of Entrepreneurship, Contributions to understanding entrepreneurial life. Amsterdam, PhD thesis Vrije Universiteit Amsterdam.
- Watson, T. (2000). "Ethnographic Fiction Science: Making Sense of managerial Work and Organizational Research Processes with Caroline and Terry." Organization 7(3): 489-510.
- Winter, M., C. Smith, et al. (2006). "Directions for future research in project management: The main findings of a UK government-funded research network." International Journal of Project Management 24(8): 638-649.
- Zevenbergen, J., J. Bulens, et al. (2009). "Geoportal Network" - More Process Catalyst than Project. UDMS 2009. Ljubljana, Slovenia.
- Zevenbergen, J., M. Hoogerwerf, et al. (2006). Connecting the Dutch Geo-Information Network–Liberty United. UDMS. Aalborg, Denmark.