Co-creation : a way to reach sustainable innovation?

Chapter 22 Co-creation: A way to reach sustainable social innovation?

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1 Introduction

From the early nineties sustainable innovation focused on technological and material innovation. This approach led to numerous incremental improvements aiming at the reduction of emissions, and reduction of use of resources, often initiated through top-down governance. Tools and methods for this type of ecodesign have been developed and are more and more applied in practice (Tischner eds, 2000). Nevertheless, over the past ten years it has become clear that this approach seems to have negative rebound effects. (Masuda F., 2005)

The question arises: "What is sustainable innovation in addition to ecodesign and technological innovation?" The object of study of sustainable innovation has slowly transformed from a product focus towards a system focus, as illustrated in the product service system approach. Related projects starting from the early year 2000 are the European fifth framework programme focussing on product service systems and including SusProNet (2003-2004), Designing Eco-efficient Services research project at TU Delft, and the Highly Customized Services-project (HiCS, 2002-2003) This product service systems approach inherently leads to a design act of more complexity involving many different stakeholders.

We also see a movement in society towards the rise of grass-roots initiatives. In this paper the development process of grass-roots initiatives is explored and discussed with regards to its possible merit for sustainable innovation. These grass-root initiatives were gathered as part of the Emerging User Demands (EMUDE) programme of activities. This programme was initiated by Politecnico di Milano and funded by the European Commission's Sixth Framework programme. This paper's results are based on an exploration of seventeen bottom-up initiatives so-called

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promising cases in the Netherlands. Co-creation processes, methods and tools could be linked to the successful development of bottom-up initiatives. Studying these processes and tools will create an opportunity for the sustainable development of initiatives in society: for the local people involved, companies, (local) governments, consultants, and designers.

2 Participatory design and co-creation

Participatory design principles, tools and methods are used in the development of products, technologies or social institutions. The aim of participatory design methods is to develop more responsive to human needs. (www.pdc2006.org). The last decade a shift is becoming visible. One could say that the slight difference between the meaning of "participatory design" and "co-creation" represents a subtle but fundamental shift in the development of the design discipline. The rise of participatory design already put the traditional concept of design as an individual creative activity upside down, and transformed design to being a creative activity in which users really participate. This kind of participation is aimed at achieving design results that really fit the needs of the prospective users. The recent shift from participatory design to co-creation is a further development in which design is becoming a collaborative process (Scrivener eds. 2000). In such a process, the 'user' is not just involved as a source of information, an input for the work of the designers, but the 'users' ARE the designers. The adoption of such an approach has far reaching repercussions for the role of the designer, who has to share the creative part of the process with a group of stakeholders.

There are great benefits in adopting this approach: if this really works well, one could not only achieve a perfect fit between the design and the user needs, but also get a real user buy-in for the design solution. This is particularly relevant in the case of the kind of socio-cultural change process that we deal with within the field of sustainable innovation. Any designed solution is only as good as the amount of stakeholder support, and the quality of the stakeholder involvement. Therefore, it is interesting to explore the tools and methods that are described in the budding literature on co-creation, and see how these could be used in the context of the creation of sustainable innovations.

3 The EMUDE project: methods and tools

The aim of the EMUDE project was to explore the potential of social innovation in Europe as a driver for technological and product innovation, with sustainability goals in mind. While gathering promising cases, we focused on initiatives in society which seem promising in creating innovative solutions that include an integration of social, environmental and economic solutions for problems people nowadays face, thus taking into account the three pillars for sustainable development.

Starting point for the EMUDE project was the assumption that creative communities, and the promising cases or bottom-up initiatives they generate, can both anticipate a possible future, and offer concrete indications as to how technological, product and market innovation could be oriented. (Manzini

eds., 2003) Students of eight design schools from all over Europe collected promising cases of such developments. Tools to manage and record the cases had been developed by the consortium task leader Politecnico di Milano. These tools include:

- a "training the trainers" workshop to inform the co-ordinators of the eight design schools on definitions, materials and method to apply for the process of collecting,
- a training guide to explain the method for collecting and recording the promising cases to the school co-ordinators and students,
- a reporter's book representing the format for interviewing the people of a case,
- a light format for recording preliminary results of literature and media search for cases,
- an in-depth format for a detailed description of a case after validation of the light format by the consortium,
- an Internet repository functioning as a database for the consortium to use for further research.

Before the students were sent to search for cases in society, they were instructed by explaining what social innovation is considered to be in view of the EMUDE-project, and by given examples of promising cases that had been gathered in the test phase of the EMUDE-project. The definition of social innovation as given to the students was: social innovation includes changes in the way individuals or communities act and organize themselves to get a result, i.e. to solve a problem or to generate new opportunities. This definition was derived from the experience and knowledge gathered in the Sustainable Everyday project, captured in the homonymic book of Manzini and Jégou (2003).

One hundred and eleven cases from all over Europe were collected, validated, recorded in-depth through interviews with the case-owners, and uploaded in the Internet repository for research by the consortium.

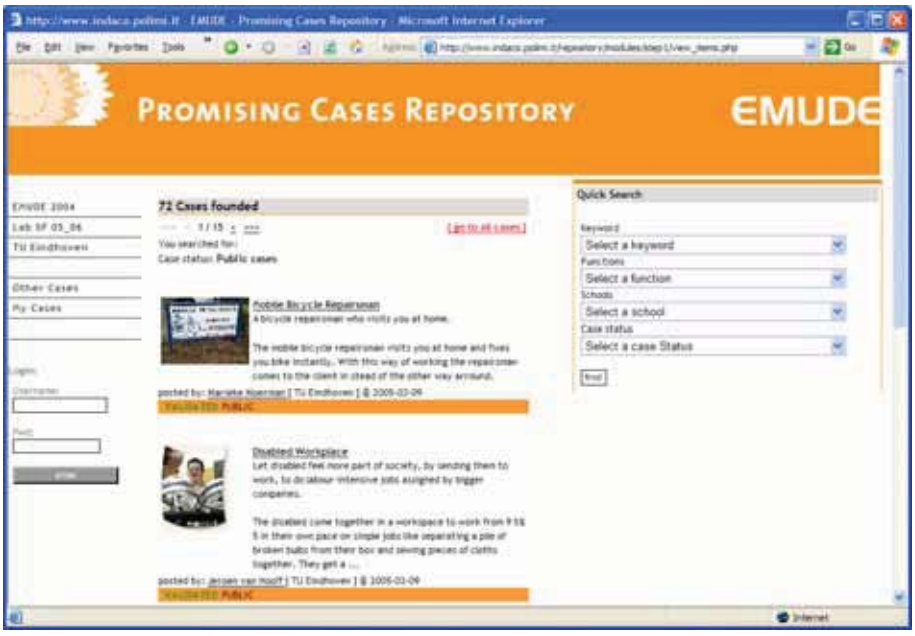

Figure 1: EMUDE Internet repository.

Figure 2: Mood board promising case “de Werfterp” (WER).

Seventeen of the Dutch cases have been elaborated by students of the department of Industrial Design at the Eindhoven University of Technology into a system organization map. This system organization map tool was developed in the HiCS-project (Manzini eds. 2004). This mapping of the Dutch cases took place outside the scope of the EMUDE-project. The aim was to get a more detailed view on how the different stakeholders of a case participate or co-operate, and how flows of information, products, services, and money exactly take place. Each case was elaborated by a different set of two students. Based on the information available in the EMUDE repository they prepared the system organization map (e.g. see figure 4), and questions for a follow-up interview with one or two of the case-owners. These interviews revealed new information on how the cases actually started or work in reality. This new information made it possible to map the cases with regard to complexity and the nature of initiation of a case. After this second analysis of the cases, the students got the assignment to design an intervention to improve the level of sustainability of the case they analysed. The table below gives an overview and short description of the seventeen Dutch cases analysed. In the next paragraphs the mapping of these cases is explained and three cases with their design interventions are described in more detail.

Table 1: Seventeen Dutch cases. The three-character codes correspond to the codes used in figure 3.

	Case Title	Initiator	Nr. of people involved	Key Innovation
DWO	Disabled Workplace	Association "Meare"	unknown	Mentally disabled people feel more confident and part of society, by getting the opportunity to do uncomplicated labour-intensive work assigned by companies.
CIN	Childfriendly Injectionrooms	hospital employee	unknown	Child friendly furnishing of an injection room, so that they do not get scared for the treatment they have to undergo.
KER	De Kersentuin	private persons	start: 5 to 10 people. Current situation: residents association "de Kersentuin" for 94 families.	A socially and environmentally sustainable neighbourhood designed by the inhabitants in co-operation with architects and housing corporation.
AQU	Aquarius	private seniors	start: 5 to 10 seniors. Current situation: 5 people in daily management, 45 inhabitants.	Quarters developed by seniors with the aim to live together in separated houses, helping each other when needed but with high independancy.
WER	De Werfterp	private persons and entrepreneur.	start: 2 private initiators. Current situation: 5 to 10 people involved.	Creating a live-work environment where humans and nature come together.
NIE	Nieuwlande	local interest group of villagers "Plaatselijk Belang"	start: 10 to 15 people. Current situation: whole community involved = 500 families.	Inhabitants initiative to improve living circumstances and the social network in their small village through co-operation with municipality and working groups.
LGA	Loan Gardens	local government + private person	start: 2-5 people. Current situation: 80 people.	Enabling inhabitants of a condominium-neighboorhood, to maintain a little piece of public garden, thus enhancing social relationship between inhabitants.
NSH	Neighboorhood Shares	local government	start: 3-5 people. Current situation: unknown est.>80	Residents take over responsibility from municipality for certain maintenance tasks for their neighbourhood: Residents, schools, members of a certain association (soccer team, dart players) receive money from municipality to complete neighboorhood maintenance tasks.
MAR	Domain Marienwaerdt	farmer/entrepreneur	start: 2 people. Current situation: 12 to 80.	An economically and ecologically sustainable exploitation of the domain which creates a balance in farming, nature, cultural history and recreation.
CHC	Childrens Holiday Card	private person	start: 2 people. Current situation: 4 volunteers involved.	Small free excursions in the fields of sports, nature and discounts at local companies for children that do not go on holidays in summer.
STM	Stichting Milieunet	entrepreneur	start: 1 person. Current situation: 5 people involved.	Internet site and access to a network of suppliers for second hand building materials.
SEC	Senior Club	private seniors	start: 2 people. Current situation: 10-15 people involved.	A space to meet, share experiences and perform creative and relaxing activities for seniors in a new neighboorhood.
BIR	Bicycle Repairman	entrepreneur	start: 1 person. Current situation: 1 person.	A bicycle repairsman who visits you at home with his mobile workshop.
TDV	Tour de Ville	entrepreneur	start: 1-2 people. Current situation: 20 employees.	Fast parcel delivery throughout Eindhoven by bike.
KBD	Komeet Delivery Bike	entrepreneur	start: 1-2 people. Current situation: 13 employees.	Fast parcel delivery throughout Amsterdam by bike.
LRR	Living Room Restaurant	private seniors	start: 2 people. Current situation: 2 people.	Once a month a couple that loves to cook creates the opportunity for unknown people to have dinner at their home.
AIE	Artist Involvement in Education	artist	start: 1 person. Current situation: single initiative.	Challenging (young) people to explore creativity with existing garbage objects to promote the use of garbage in expressive works (artworks) and thereby questioning the image of garbage in general guided by an artist.

4 Mapping promising cases

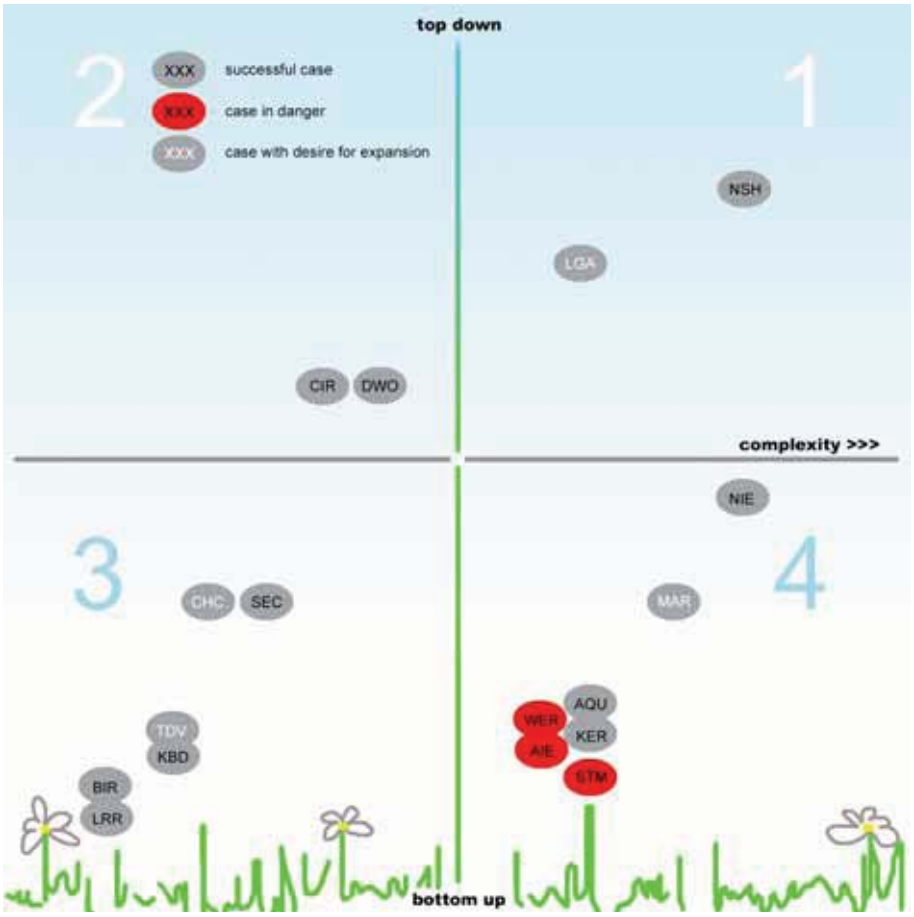

Figure 3: Promising Cases Map.

4.1 Top-down versus bottom-up initiation

One of the distinctions that can be made between the cases after in-depth analysis was that of a top-down versus a bottom-up start of a case. Top-down stands for the level of involvement of government in the initiation of a case. In the matrix shown in figure 3 no distinction is being made between local or higher-level government involvements. It is necessary to remark that all cases have a local character, which is inherently connected to the guidelines that were set for collecting the cases. The level of top-down initiation depends on the governance tools used by government to initiate a case. The most "severe" and direct governance tools are considered to be laws and restrictions, penalties and taxes. Governance tools considered to be less directive and creating an environment for participation is governmental funding, and the actual initiation of a project in participation with inhabitants, local entrepreneurs and the like. The horizontal axis indicates a virtual border between top-down initiation by government, using a set of governance tools ranging from directive top-down tools towards close participation with the people involved in the solution. Below the horizontal axis, local community members initiate cases. A distinction in bottom-up level in the vertical direction is made, taking into account macro-level

interventions of government, that influence peoples behaviour at the micro level. For example the top-down reformation of agriculture over the past twenty years in the Netherlands can be seen as a driver for farmers to start new activities to create an income with their resources and through seeking co-operation with others. In this map the initiative of a farmer would be mapped a bottom-up case, although from a macro level perspective this initiative could be considered to indirectly start through government influence.

4.2 Increasing complexity

Complexity of a case increases with the number of different stakeholders and more flows of information, products/materials and money necessary to make the solution work. One indicator used to determine the complexity of a case is the system organization map.

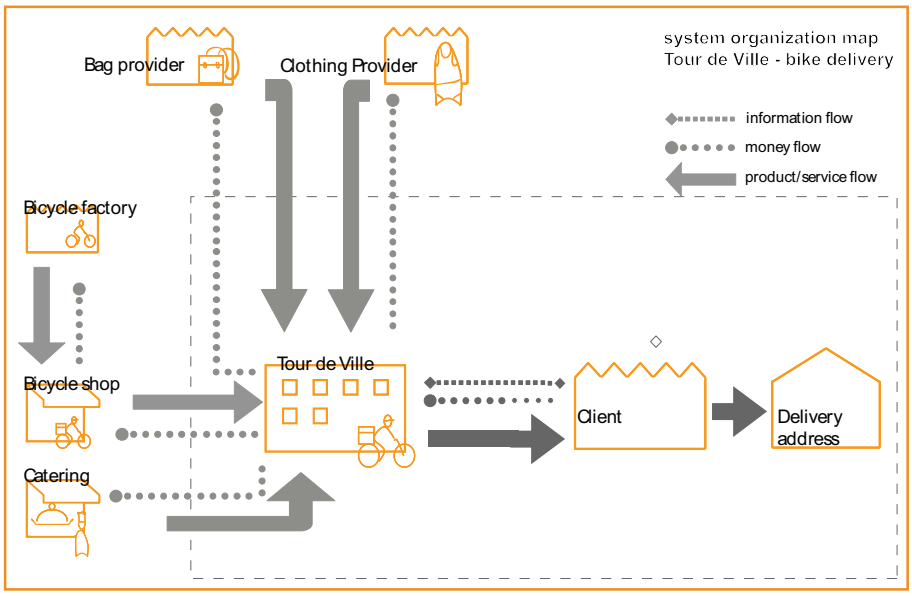

Figure 4: System organization map Tour de Ville (TDV): a promising case with low complexity.

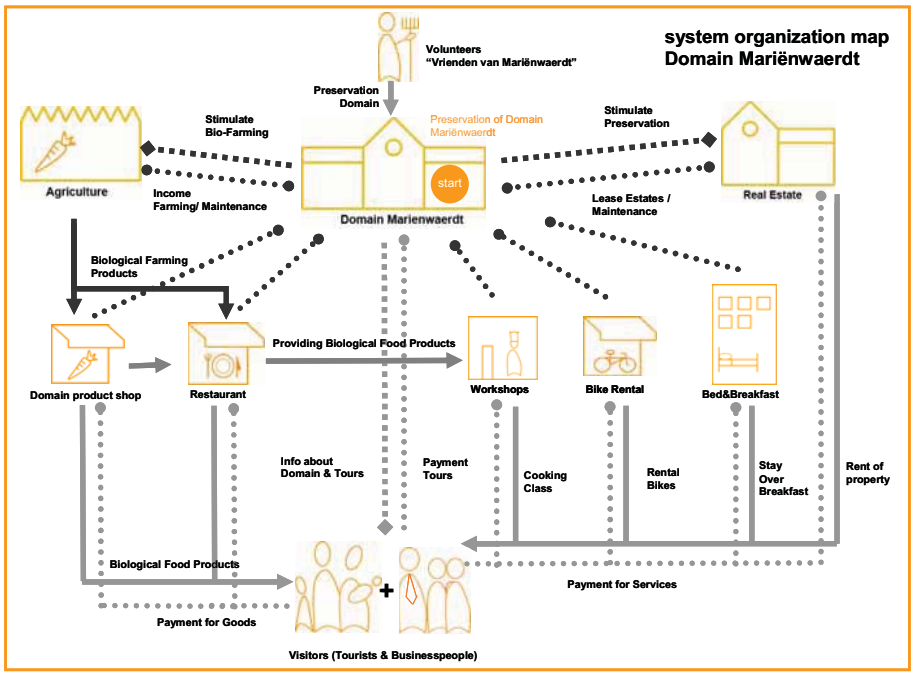

Figure 5: System organization map Mariënwaerdt (MAR): a promising case with high complexity.

4.3 4 quadrants

The first quadrant (figure 3, top right) represents cases with high complexity, affecting a community as a whole. Initiation takes place due to a discomforting/problematic situation in the (local) community, and is initiated by the (local) government. Initiation can take place through various governance tools. Only two cases are mapped in this quadrant due to the fact that the assignment to the students was to explicitly search for bottom-up initiatives. The reason why these cases were included in the database is the lack of exact information about these cases in the first phase of analysis.

In the second quadrant (figure 3, top left) cases are mapped, which are initiated by governmental institutions or institutions closely related to government, like for example health care. Complexity is considered to be lower than in quadrant one, because in these cases the solution includes only a small group of people in society. Again only two cases are mapped in this quadrant due to the fact that the assignment to the students was to explicitly search for bottom-up initiatives.

The third quadrant (figure 3, bottom left) represents cases, which are true bottom-up or grass-root initiatives. People with creative ideas start a small but innovative business or create a solution, which affects a small group of people (less then 50 people involved in the system as being direct stakeholders). Cases in this quadrant might have the potential to grow, which would mean moving to quadrant four due to increasing complexity.

The fourth quadrant (figure 3, bottom right) contains cases, which are grass-root initiatives of higher complexity: the number of different

stakeholders involved in the system is high compared to the cases in quadrant three, and the number of people involved or affected by the solution is high, meaning over fifty people involved.

4.4 Exploring the cases in quadrant 1, 3 and 4 with regard to co-creation and participation.

Through mapping of the cases along the variables "complexity" and "top-down" versus "bottom-up" we found out that especially in cases with high complexity participation and co-creation play an important role (quadrant one and four). As well the success and long-term sustainability of a case depend on true participation and co-creation between the various stakeholders involved. In cases with low complexity, as demonstrated in quadrant three, success is more dependent on the entrepreneurship and enthusiasm of the initiators. In the below sections a detailed exploration of the quadrants 1, 3 and 4 is described.

4.4.1 quadrant 1

Both cases in quadrant one include the professional and active use of participatory design tools. In one case (LGA) inhabitants took the first initiative through seeking participation with local authorities. As soon as local government got interested they took the lead. The solution was developed in close co-operation between authorities and inhabitants. In both cases a professional consultant was involved to guide the process. Participation tools and methods like for example workshops with people of the community, interviews, focus group meetings etc. were applied in both cases mapped in this quadrant. Co-creation, defined as to be a collaborative and even community design process, wasn't present in both cases. The services and structures that were developed in these cases were first conceived by professionals and then discussed with the people in the communities involved.

4.4.2 quadrant 3

Participation with other stakeholders in the creation phase of the development process hardly takes place, and doesn't seem to be necessary for the successful development, due to the relatively low complexity of the system that is being developed. The success of a case is highly dependent on the motivation and entrepreneurship of the initiator. Participation and co-creation seem to become important if a case-owner decides to want expand the solution. The cases mapped in this quadrant in grey ellipses and red fonts have indicated this ambition, and might benefit from applying participatory design and co-creation. This drive to expand often has to do with the ambitions of the initiator of a case.

4.4.3 quadrant 4

Initiators of a lot of cases in quadrant four implicitly apply participation and co-creation tools and methods. In only one of the cases in this quadrant (KER) professional consultancy is present throughout the complete

development of a solution and co-creation and participation tools are used explicitly. Cases in quadrant four in which participation and co-creation is missing are less successful or do not work at all as a solution. Examples are the cases “Artist Involvement in Education” (AIE) and “Stichting Milieunet” (STM). These cases both lack the active co-operation between and involvement of various stakeholders, which is needed to sustain the system as it was created initially. These cases started as promising cases but have reverted to single, stand alone initiatives and actions.

Another case in quadrant four (WER) suffers from the lack of active participation and co-creation between the various stakeholders during the development of the case. This case finds itself in the initial phase and the people involved are getting more and more frustrated for not being able to move on. Effort is put in creative sessions together, but participation with different stakeholders is missing. Also the implicit application of participatory design tools and co-creation is missing, due to a lack of knowledge and experience. Case owners in general perceive the development of a solution as complex.

Successful cases in quadrant four all show active participation between the various stakeholders. Solution wise these cases are comparable to the less successful cases described above. Participatory design tools and methods are applied both consciously and unconsciously. In several cases (like “Marienwaerdt” (MAR) and “de Kersentuin” (KER)) true co-creation takes place, in which various stakeholders take part.

In line with the above written exploration of quadrant four, we can say that using participatory design tools and co-creation, is one of the success factors for the development of a complex bottom-up initiative.

5 Three promising cases and their design interventions

Three cases in the consumption areas agro-food, mobility, and housing are described below. Especially the first case illustrates the implicit use of co-creation in the development process. For all three cases design students made proposals on how to improve the level of sustainability of the case. These examples give us an impression of the spontaneous roles design students take in co-operating with the creative communities.

5.1 The Domain Mariënwaerdt

5.1.1 background information

Domain Mariënwaerdt is a domain of in total 960 ha in the town of Beesd, the Netherlands. Since the year 1734 the domain is owned by family van Verschuer. Agriculture was the main source of income at the domain for ages, which hosts 5 rent companies that farm on the domain. Growing of various crops like sugar beets, and corn, keeping cows for milk, and fruit farming were main resources for the past 250 years. Next to agriculture, about 350 ha of the domain consist out of forest. In the 1980’s the domain was a large flourishing agricultural company, but at the start of the 1990’s

revenues started to decline. The domain faced serious problems due to falling subsidies for agriculture in Europe, the introduction of production quota etc.. Renters started to leave and sustainable maintenance of all property became more and more difficult.

5.1.2 key innovation

An economically and ecologically sustainable exploitation of the domain, which creates a balance in farming, nature, cultural history and recreation.

5.1.3 solution description

In the early 1990's it was clear to family van Verschuer that something needed to change. They got funding to have an external consultancy office to give them advice on how to revitalise the domain. Not being pleased by the results of this research, they decided to get together all renters and other people working on the domain to discuss problems and possible solutions. In ten years time, the domain was reorganized to a healthy and well-maintained business based on bio-agriculture. New resources of income, like the production of cheese, jam and other bio-agricultural products, a domain-shop for eco-products, a "bed-and-breakfast" facility and a pancake-restaurant, are now operational. There are still five rent companies, and in total about 50 people are employed by the domain. Ten employees also live on the domain and a number of houses are rented to other people. The owners established a "Friends of Mariënwaerdt" association in 2002 to involve people interested in the development of the domain. Members support the domain through a yearly contribution. They are actively involved in discussions and the decision-making process with regard to the further development of the domain. Figure 5 illustrates the system organization of this solution

5.1.4 design intervention

Sustaining the domain was the starting point and main driver for initiator Mr. Verschuer. At this moment the domain is still in the process of transforming its agriculture into a 100% ecological process. The initiative is very successful, which is also demonstrated by the fact that Mr. and Mrs Verschuer recently received an award for the most creative and innovative local entrepreneur of 2005. The students nevertheless searched for ways to lift the level of sustainability of the domain. The design goal they set was to stimulate children to learn about ecological farming, preserving the natural environment and getting to know more about local history. By organizing events and activities for children, an emotional bond with the domain is created, which might motivate them to support the domain in their adult lives.

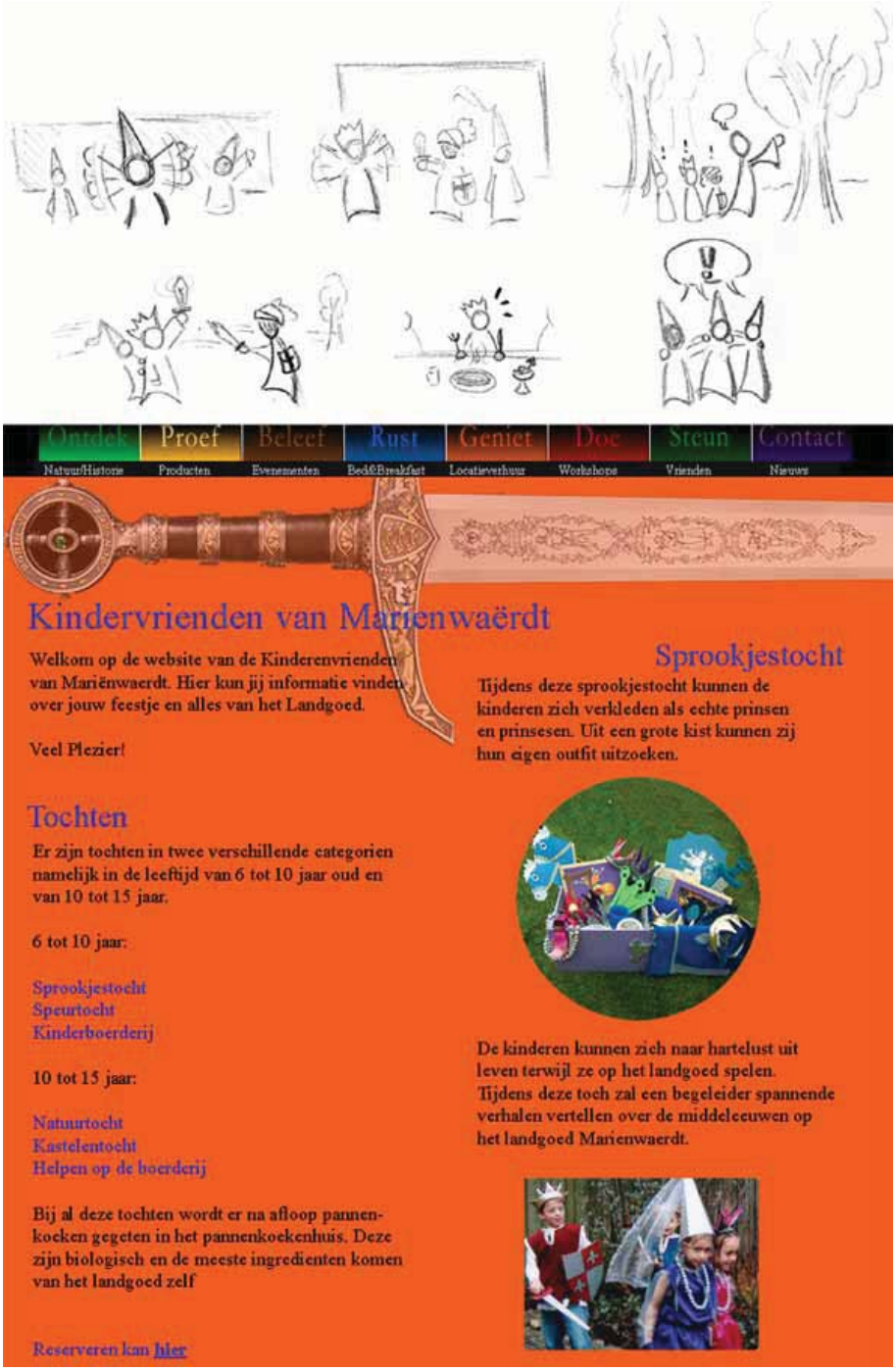

Figure 6: Design intervention Mariënwaerdt

5.2 Tour de Ville – bike delivery

5.2.1 background information

Roads in the Netherlands and especially around Eindhoven are becoming more and more congested. At rush hour and also during the day, it is almost impossible to quickly move through Eindhoven by car. Fast delivery of packages by car is almost impossible.

5.2.2 key innovation

Quick package delivery by bike within an area of 20 km: avoiding traffic jams and reducing the impact on the environment.

5.2.3 solution description

Package delivery by bike in a city like Eindhoven is much quicker and reduces the need to drive around with mini-vans. A group of young people, fanatic in bike racing, decided to transform their hobby into their work. They are well trained sportsmen, who are able to cover a distance of about 15 to 20 km by bike in half an hour. Companies can call a central number and a cyclist will be sent. The client can choose for delivery within an hour or within half an hour. There is also an option for regular service, e.g. the daily delivery of the companies' P.O. Box content by bike.

5.2.4 design intervention

The solution is sustainable from an environmental point of view, even if this wasn't the main goal of the initiators. To make it more attractive for companies to make use of this service, the students came up with a solution of a decentralized system. Through this system, using GPS and mobile telephones, efficiency and action radius can be improved. Cyclist can pass packages to each other, making it possible to serve a larger area. An integrated communication device has to be developed.

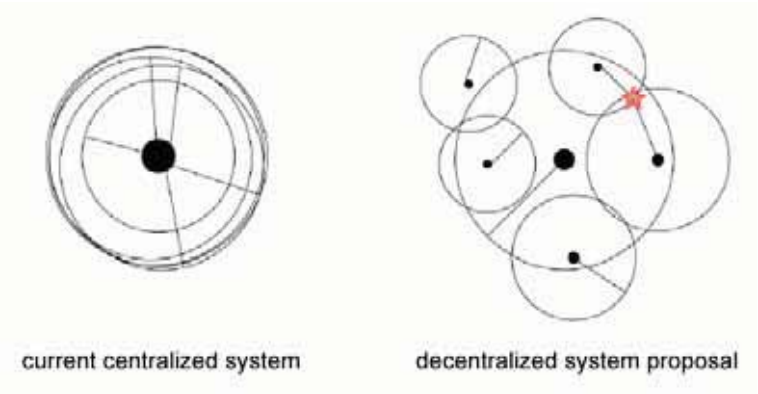

Figure 7: Design intervention Tour de Ville. Decentralized delivery system.

5.3 De Werfterp – ecological living

5.3.1 background information

Marien Faase, architect of profession, wanted to build a house where the experience of living was integrated in the design of the house. The building should combine harmoniously living, working, learning, playing and care. With the help of volunteers, investors and founders the house was built. The people involved want to create a way of living distinct from "the usual": to be connected in the neighbourhood, living in harmony with the environment.

5.3.2 key innovation

To create a live-work community that fulfils the human need to be socially connected.

5.3.3 solution description

At this moment the Werfterp-project consists of a building called “het Werfhuis” and a connected plot of land called “de Werfterp”. The house is nearly finished and provides room to a small school, an architect office, a family house and a smaller apartment suitable for seniors. Plans for the development of the plot of land are now being developed.

5.3.4 design intervention

The in-depth analysis of this case revealed a certain disorganisation. All people involved are dedicated and enthusiastic, but for some reason progress was not being made. We organized a workshop to clarify how the current system works. A system organization map was generated together with the students and the core team of people involved in the development of the Werfterp. This descriptive system organization map revealed the obstacles which caused deceleration. After this intervention the case-owners regained the development of the Werfterp independently.

Figure 8: Design intervention “de Werfterp”. Descriptive system organization map used to distinguish current obstacles.

6 Conclusions

Exploring the development process and categorizing the cases demonstrates the implicit presence of participatory design and co-creation in complex bottom-up cases. Methods and tools, as can be found in literature on participatory design (Sanoff, 2005), are being used by initiators and communities. There seems to be a correlation between the successful development of a case and the application of participatory design tools and co-creation. Studying these processes and tools will create an opportunity for the sustainable development of grass-root initiatives in society: for the local people involved, for companies, (local) governments, consultants, and designers.

The question now arises how to do participatory design and co-creation for sustainable development of bottom-up initiatives. A first answer could be gleaned from the spontaneous roles the design students took while having to improve the level of sustainability of a case. They were creators of innovative and fresh ideas, facilitators in the development process, critical analysts, co-creators, and learners. The outcomes varied from new product ideas, to system changes or the proposal for an extended product-service-combination. A special outcome we observed is the learning effect that resulted from the design proposals. Discussing the design proposals with the case-owners revealed the dynamics of the system behind a case. This leads to an iterative approach in which the design focus would be on the creation of design proposals aimed at learning how to improve the system, instead of focusing at the design of the one and only final solution to one problem.

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