

Contextualizing Power in a Collaborative Design Project

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ABSTRACT

Power relations are a major concern in participatory design (PD). We explore how power relations are played out in a commercial collaborative design project that has not been influenced by PD techniques or interests. The case reconfirms many of the underlying principles of PD in handling power. At the same time, our Foucault-inspired analysis of the contextual dynamics and hidden power structures in user practices suggests certain extensions and improvements to the analysis of power relationships in PD projects.

Keywords

Collaborative design, Participatory design, Context, Power, Foucault

INTRODUCTION: CHANGING CONTEXTS AND POWER RELATIONS IN COLLABORATIVE DESIGN

“Cooperative design certainly supports user participation. But the focus on process, action, and situatedness tends to disconnect the design process from the larger organisational context in which power is enacted. . . . The underlying belief is that . . . computer systems developed in a cooperative process have a liberating power. This is not always the case.” [1]

In expressing their concern about the lack of emphasis on power, values, and politics, Bjercknes and Bratteteig articulate the point of view of the “traditional” Scandinavian participatory design (PD) movement with respect to many current projects in collaborative design [2]. This point of view emphasizes that technology should be created democratically in projects with and for the users, with explicit emphasis on power, politics and democracy in the working place, accompanied by designers’ purposeful coordination with workers e.g. [3].

However, not only has Scandinavian society changed since the days the trade unions first experimented with projects to develop democratic technology, but PD has also proliferated well beyond its original contexts. During this process, the border between the projects instantiating PD ideals and other collaborative design projects has become increasingly blurred. Projects with genuine PD interest have been conducted within the interests and constraints of

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industry cf. [4, 5]. At the same time many methods that originated from PD have become commonplace tools for the mainstream software (SW) design and industry cf. [6, 7]. The open source movement in SW development, “lead-user” method-based collaboration, “co-configuration”, and increased emphasis on customer relations all point toward the proliferation of design practices that engage companies in direct collaboration with users. With irony it might be said that despite its “democratic ballast,” collaborative design is well on its way to becoming a widely recognized approach in product design cf. [8] [6].

This historical development underpins our concern with what in the opening is actually meant by “the larger organisational context in which power is enacted” [1] and how it is to be accounted for. How do the “old lessons” fit the emerging way of doing collaborative design in commercial and product-oriented contexts? Should some of the wisdom accumulated in PD be supplemented or reconsidered in the light of the results of non-PD-informed design projects? In the following, we discuss our research on a multiparty design project that created a database program for diabetes professionals. We place particular emphasis on the benefits, losses and constraints for each of the partners involved in (or excluded from) the project. We attempt to explain these through an analysis of the power relations at play in the process. To gain more insight into power dynamics we employ Michel Foucault’s genealogical research framework.

The structure of our analysis is the following. First, we introduce some of the key features of how power relations have been addressed in Scandinavian PD projects. We draw implications for how PD would inform collaborative design taking place between a commercial company and user sites. We then introduce Foucault’s notion of power, after which we progress to our analysis of the design project and situate that project in the “meso-context” of other attempts to create and implement similar programs. In section five, we discuss the outcomes of the project for each of the participants and provide an account of how power relations affected the outcomes. We conclude with remarks on ways to analyze the contextual dynamics and embedded power relations that are present in design projects.

Our analysis is a result of a three-year case study from 1999 to 2001. As outside social scientists, we followed a multi-party design project from the launch of the first version onwards, and carefully reconstructed the events prior to the start of our field research. In addition, we contextualized the project under scrutiny with a historical study of all the previous attempts to develop diabetes databases in Finland. Our data was gathered through ethnographic observation and interviews and an analysis of the historical documents of both the user and designer activities. A thorough presentation and discussion of our methodological scheme and its theoretical background are available elsewhere [9].

2. Participation and power issues in participatory design

2.1. Addressing power in the collective resource approach and participatory design

In the following, we outline our understanding of some of the key characteristics of PD and discuss whether it has clear implications for the collaborative design projects in commercial contexts.

At the very outset, PD intertwined the issues of power and participation. Workers' participation in technology design was seen as a means to counter negative effects (the reduction of workforce, de-skilling, and reduction of the quality of work life) that management-deployed technologies often introduced [10]. These initial factors resulted in the emergence of a number of principles regarding participation and power. Fundamentally, PD, which was originally known as the collective resource approach, was primarily concerned with satisfactory work life as a source of well being and productivity, and, thus, was explicitly concerned with workplace development. The movement adopted an explicit "conflict perspective" on work relations. Instead of a consensus view, the interests of management and different groups of workers were assumed to be adversarial, *per se*. Moreover, workers were seen as being in a weaker and potentially oppressed position that could be strengthened only through the exercise of collective power through trade unions. [3]

These principles led to an array of further measures designed to firm up the principles. Efforts were made to come to an agreement with management about the project, and its objectives and long-term maintenance. Designers aligned themselves purposefully with the users and took it upon themselves to acquire an in-depth understanding of the work practices involved [11-13]. Efforts were made to place the negotiations on a democratic footing by ensuring that all the effected worker groups were represented in the design process. Following the conflict perspective, management or adversary worker groups were not allowed

in the same design sessions if there was a chance that their presence would affect the other groups. During the sessions, emphasis was laid on ensuring that all the participants had an opportunity to express their points of view. Lastly, entire arrays of tools and arrangements were developed to provide the workers with means to understand the design process and have a true impact on it. The idea was that these tools would have to be relevant to workers actual experiences and thus allow them to comment on the details of the design, and envision how they would influence the work routines [3, 10]. Implicitly, the emphasis was laid on ensuring democratic processes within the design project, even though the prime threats were seen to arise from the society-wide political asymmetries.

2.2. Lessons that can be derived from PD for collaborative design in commercial context

The context in which PD was originally developed differs considerably from cooperative design projects involving users and a commercial company. Nevertheless, PD's background assumptions and methodological logic do provide some suggestions for the implementation of such projects. The most relevant to us here are:

First, judging from the issues addressed in publications on PD, the prime concern seems to lie in creating tools and means for participation that facilitate efficient and meaningful participation in the first place e.g.[14-17]. From this we conclude that adequate tools are of critical importance in a commercial setting as well.

Second, the conflict perspective would suggest that company-user collaboration is essentially a form of adversarial collaboration as well. SW producers try to maximize their profit, while users attempt to gain use value and minimize its costs by becoming involved with the development of the new technology. Successful collaboration assumes that the gained mutual benefits will outweigh the market contradictions. Nevertheless, as with manager-worker relations, a commercial company may dispose over vastly superior resources and power than any one individual user, thus leaving user partners potentially vulnerable.

Third, an important difference lies in the role of designers. As employees of the SW company, they cannot be assumed to align themselves with users even if they personally sympathize with users' perspectives. Our interpretation of PD is that without a formal agreement between the company and the user partners, users could be easily excluded from the decision-making process. This risk is emphasized by the vulnerability of participatory product development processes in corporate environments that are subject to ad hoc policy-making [18] [19].

A fourth major difference is that of workplace development and product development. While users seek to improve

their working conditions and procedures, the company objectives are by no means restricted to success in any one individual site. While this clearly leads to an asymmetrical relationship between users and designers, the only implication from PD we could come up with is to regulate the interests of the participants with a formal agreement about the future of the project. Furthermore, our interpretation of PD is that neither the user partners nor the company should be automatically trusted to promote inclusive and meaningful democratic participation of all the affected parties.

3. The analysis of power in a collaborative design process and its context: a Foucauldian perspective

The later work of Michel Foucault offers an interesting framework for the analysis of power relationships in a design process. We believe that this framework may prove particularly fruitful in analyzing the contextual dynamics of collaborative design. Power in Foucauldian terms is not a commodity that can be possessed, transferred or alienated through, for example, legal acts and contracts. Power exists only in action and is employed and exercised through networks. In a network of power, individuals are simultaneously subjects and objects of power. In other words, “individuals are the vehicles of power, not its points of application” pp. 98 [20].

Foucault’s genealogy of power draws attention to the productive characteristics of the power relationships of the modern world. Alienating and repressive power relationships are weak in comparison to the productive, “positive” exercise of power that investigates, creates and shapes things (for example, efficient and faithful citizens), and produces new knowledge (such as classificatory knowledge of the human body). Hence, strong power, also called disciplinary power, creates its own discourse, knowledge, identities, institutions and artifacts pp.106[20]. Foucault’s well-known examples of disciplinary power mechanisms include the creation of modern prison and psychiatric hospital systems [21, 22].

Even though Foucault himself avoided simplified definitions of power, some definitions of a Foucauldian power relationship can be crystallized for the sake of clarity [23] cf. [24]:

1. A power relationship is present when the actions of one actor determine those of another.
2. A power relationship should be differentiated from an open conflict between actors.
3. A weaker actor is capable of making decisions and is able to rise up against the more powerful actor.
4. A power relationship is intermingled with other kinds of relationships, such as communicative, exchange-based and production relationships.

5. A power relationship may reinforce or modify a system of inequality.
6. A power relationship is dependent on the means that the actor in power can employ in order to create and sustain it. The means can be institutional (e.g. a hospital), rational (e.g. treatment guidelines) or material (e.g. a health care database).
7. A power relationship emerges from contingent local processes, from which it can expand and institutionalize generally.

Foucault’s genealogy is not interested in *why* power is exercised but *how* i.e. what concrete mechanisms it uses. Foucault recommends an ascending analysis of power that starts from “infinitesimal” power mechanisms and investigates how these local mechanisms are expanded to more general systems pp. 99[20]. In this genealogy, the concept of the event is fundamental. Following Nietzsche, Foucault argues that “forces operating in history are not controlled by destiny or regulative mechanisms, but respond to haphazard conflicts” pp. 154 [25]. Consequently, the concept of the event has two characteristics. First, it is agonistic. Each event contains conflicts that should be analyzed in terms of their strategic developments and tactics. These analyses, in turn, make it possible to understand the contingent and hazardous nature of historical development. Contingency is the second characteristic of the event. Analysis of the details and accidents related to the events shows that the necessity of the historical development is only a retrospective attribution pp. 114[20], pp.114; [25].

We are now able to make some suggestions for applying a Foucauldian analysis of power to collaborative design processes and their contexts. First, power relationships should be studied in terms of activities that lead to the production of knowledge, artifacts, work practices and institutional elements. The emphasis of analysis should be laid on what Foucault calls strong power relationships and not only on weak and obvious power relations, such as repression. In a strong power network, a database may form an essential component. For example, the content and structure of a diabetes database effectively determine the work routines of a diabetes reception. Second, power relationships should be studied in the terms of conflicts, tactics, and strategic development. The approach should not be normative and operate on the basis of formal procedures of emancipation. This implies that it is harmful to use producer-user or employer-employee dichotomies as the starting points of analysis, as they may conceal the dynamics of a power network in which all positions are temporary and open to change. These dichotomies may also conceal diverse conflicts between actors, such as conflicts between different user groups. Third, the analysis should be ascending, starting from the local development and its

details and accidents, before progressing to the expansion of the power network. For example, an information system, which forms a standard at the present time, should be studied historically from the beginning of its development. This may reveal contingent events and conflicts between actors who are not visible in the current practice.

4. Collaborative design in the wild: PDMS¹ as a multi party collaboration between users and a SW company

4.1. The outline of the PDMS development project

Some forms of user-designer collaboration are common in medical technologies. In such branches as the development and manufacturing of medical instruments, most of the new technological innovations are initiated by users [26, 27]. The likely reason for this is the restricted access and the privacy of medical settings. Designers often do not have sufficient knowledge of the needs of the medical practitioners [27]. As a result, it is common, on one hand, that medical practitioners search for an industrial partner to implement their ideas. On the other hand, technology companies hire medical experts to assist with their product development work. However, the collaborative design we studied, the PDMS project, is exceptional in a sense that it involved an extended network of collaboration between a SW company and number of users from various institutions and professions. The collaboration was born out of the complementary interests of the participants and involved no specialized skill, staffing or research involvement in collaborative design methods. Our own involvement in the project was restricted to the reconstruction and observation of the project until its 5th year, when we made two action-research oriented interventions [9].

The database was initiated by medical researchers of the department of Public Health and General Practice at the University of Oulu. They analysed manually over 100 000 patient sheets for diabetic retinopathy at the turn of the 1990's. As a follow-up study loomed in the future, they were eager to computerize the patient records. A municipal diabetic clinic joined the pursuit, as they wanted to have a statistical tool that would make it easier to follow the treatment balance of their patients.² With the help of a

¹ PDMS is an acronym for ProWellness Diabetes Management System, in which ProWellness is the company involved in the design process.

² Diabetes is an incurable long-term illness. In the longer run it leads to, for instance, kidney failures, heart attacks and blindness. These complications can be countered by maintaining "a good treatment balance", mainly right blood-sugar level, with diet and medication. A large amount of documentation is produced and used to control the disease over the years. For this purpose, paper forms have been the main tool, currently sought to be replaced by SW.

programmer from Oulu University Hospital, these users created a preliminary database with Microsoft Access.

In 1996, a small SW company, ProWellness Ltd, was founded in Oulu to create an Internet-based archive for medical records. The city of Oulu recommended that the parties should engage in collaboration. ProWellness saw diabetes as a good starting point, while the users saw promise in the expertise of the cutting edge programming firm. While users provided the details of diabetes care and practice, the company brought their programming skills and their experience in designing programs and databases for time-pressured work.

In the first phase of the design collaboration, both parties came to an understanding of what information should be included in the database and how it should be handled. The contents were solely specified by the users, who also spent time in educating the designers about diabetes treatment and the details of their work. The structure of the program evolved in the course of the collaboration. The main form of collaboration was ordinary, albeit intensive, communication with users and designers. Ideas were exchanged in face-to-face discussions, e-mail, as well as in simple hand-written notes and drawings about the data contents and potential interface solutions. The ideas were iterated first on paper and then worked into prototypes that were tested and developed further. The designers made the final decisions about how to incorporate the various features, however, their decisions were wholly dependent on the expertise of the medical participants. All in all, the parties were mutually dependent on the complementary resources of their counterparts.

The collaboration also quickly refined the goals of all parties. The company realized that their original archive idea had been too ambitious and too difficult to realize. Their business idea was refined into creating PDMS-like expert systems for other long-term illnesses in connection with developing citizen's self-health programs for these diseases. Users appreciated the idea that, using Internet technology, the database could be filled in by all key personnel and would facilitate coordination between the various physicians, nurses, auxiliary nurses as well as the specialized care given in the local hospital. Additionally, the company envisioned an additional module for the home use of patients. In this way, the database program grew to incorporate all the data generated in the treatment and monitoring of diabetes. The first part of this program was the physician's and nurse's screens that were piloted and further improved in the Oulu diabetic clinic beginning in 1998.

In this early period of collaboration, participants managed to create tools and some good procedures that facilitated efficient collaboration between them, even though none of the participants were aware of any PD or user centered

design (UCD) methods. However, we must remember that the users already had a history of trying to create their own applications and thus had some experience in how to computerize their work practice. Nevertheless, this goes to show that in certain conditions, in-depth user-designer collaboration can indeed be accomplished even without specialized means. The success of the project also shows that collaborative design is a feasible way of working for a commercial company. Had the company tried to gather all the knowledge needed about diabetes by itself, it would have traveled a long and rocky road.

When the first version was up and running, the collaboration network was extended with the help of the professional contacts of the users. The new participants were physicians and nurses in the diabetes clinics in the central hospitals of Tampere and Kajaani, who were giving special care to diabetics. This extended collaboration also proved successful. In two years, the specialized needs of the personnel in special care were incorporated, and the usability and statistical functions of the program were significantly improved. During the year 2000, the program was bought by a number of hospital districts in Finland and the new user sites were incorporated into the development team.

At this point, when the co-design work had been going on for four years and the program had gained a promising market share in Finland, tensions and significant problems arose in the network of collaboration. First, while the database had established itself as a *de facto* standard in Finland, being used in the most major hospital districts, it was not being used in any normal health care center in these districts. The expert network developing PDMS saw its use in health care centers as a matter of motivation and training. The collaboration was not extended to regular GP's and nurses, as the conglomerate believed they knew what "has to be in the program". Nevertheless, the primary health care seemed to shun this conviction by simply not accepting the program.

Second, instead of the previously swift action to incorporate new ideas for improvement from users, the company took a reserved stance towards the various wishes for customization and new features that were voiced particularly by new user sites. It became apparent that the company took the view that the program was essentially ready, and it accepted only those changes that were absolutely necessary. In Part, this shift in attitude occurred because the resources of the company had shifted into the internalization of their business and into making end-user programs for patients with long-term illnesses. In addition, the management in the company had partially changed and the new products were now being developed "with the leading experts" instead of a multi-professional collaboration. The company also believed that they,

meaning the company, were the ones who know how to develop databases for illnesses, particularly for diabetes.

At the same time, the medical practitioners considered the PDMS program to be expensive. Even the early developers had to pay handsomely for the program they had been developing. Moreover, the work that users had put into the development work was acknowledged only with a brief and anonymous referral, "developed in collaboration with users". To us outside observers it seemed evident that something had perhaps started to go wrong there, and that bigger risks might be looming in the future of the project.

4.2. The PDMS project in the context of developing diabetes databases in Finland

As illustrated by the quotation that opens this paper, one of the implicit characteristics of PD has been its focus on individual design projects. Even though the Scandinavian PD tradition has emphasized the over-all sociopolitical context in which design takes place, also here the practical implementations have mainly been restricted to individual sites. Perhaps not coincidentally, there is astonishingly little analysis of the dynamics of the sociotechnical "meso-level" context of a particular PD project.

During our PDMS study, we noticed that some of the user partners had also previously been developing diabetes databases. When we started to inquire what had happened to these projects, we found ourselves unearthing a "graveyard of withdrawn diabetes databases." There had been numerous attempts to create diabetes databases in Finland and almost all had foundered.

This led us to map out all the hospital districts in Finland to find out how these projects came about and what had caused them to fail. Our interview round revealed that in 11 out of 20 hospital districts in Finland, a total of 21 programs had been created since the mid 1980's (excluding PDMS). Only four of those programs were still in use when we conducted our interview and their use was not about to end in the near future. In none of the cases had the use proliferated beyond the district where the program was developed. However, these projects to develop and maintain a database were not futile, random or without effort: in 13 cases the program was used more than three years. Nevertheless, in practice, the patient information usually had to be entered during patients' visits and it took several years to gain enough coverage and depth of in the database to achieve significant benefits.

What had motivated these numerous attempts? In our interviews, it became clear that the doctors and nurses lacked tools to follow how their patients were responding to treatment. More specifically, it was unclear how the "treatment balance" of the patients, particularly the blood-sugar level, was being sustained in the longer run. This made it even more difficult to know how the patients

responded to treatment including diet and medication changes that became necessary with the advancement of the disease. At the same time, the number of the diabetics continued to increase in the aging and increasingly overweight population. The attempts to develop database programs can be seen to derive from this prevailing contradiction between the demand to gain control over the complex, proliferating and expensive disease and the insufficient tools to handle information that was crucial for its treatment.

Who then developed these programs? Out of the 21 units having a database 17 had been involved in its development. In only two cases had an individual physician pieced the program together. All other projects were more or less collaborative, usually including a number of doctors and nurses from the unit where the development work was done. In roughly half the cases, the programming expertise was acquired from the computing department of the hospital. There were also two cases in which outside consultants or a software company had been involved in the development work. It is remarkable that in most cases the developers were not aware of the other database projects, even when some hospitals have hosted multiple projects in different clinics and periods. In only one case was the collaboration extended to multiple units in one district. All in all, one can characterize the projects as mainly collaborative and user initiated, yet they remained isolated attempts to come in terms with the same problem.

Why, then, had the attempts failed? To answer this question two aspects have to be considered: the reasons for abandoning the programs, and the dynamics that had led to the abandonment. Table 1 summarizes the main reasons our interviewees gave for abandoning the program.

Table 1 Reasons given for abandoning of the use of databases in the 14 units in which the use had stopped altogether. (In some places there were multiple key reasons).

Reasons given for abandoning the use of a program	
The active user developer left the health care unit	2
Hardware or programs had become outdated	3
The database had been replaced by another program	1
Program use was not seen as useful or bringing benefits	3
Changes had occurred in the organization	2
Problems had interfered with the usability of the program	8

In the same way, the reasons for continuing the use of the remaining seven programs are summarized in Table 2.

Table 2 Reasons given to the continuation of use of the databases in the 7 units in which a database was still in use (including also those 3 units where its use was about to end or there was only one active user).

Reasons given for continuation of use	
Enthusiastic user developers	5
Waiting for a new program (saving the data)	1
Complementary use of the database and paper forms	3
Good usability	1

As illustrated by the tables 1 and 2, there are a number of common reasons for abandoning a program, such as organizational transformations and technical obsolescence. Nevertheless, by far the most usual reason for the abandoning the program was problems that we have classified under program usability. The most important problems we classify under usability are the following:

- The program was too complex for daily use
- Manual filing and updating the patient data was slow and tedious
- Logging in to the program and simultaneous use of other programs was difficult
- Operating the program was too slow and difficult owing to the hectic pace of reception work

In only one case did the ease of use support the use of the program. When we inquired into the structure of the programs, we discovered that they were built to comply with care recommendations and to incorporate as much data as possible. These features were particularly desirable for the diabetes specialists and their interests in research and population level management of the disease. The more exhaustive and accurate the information, the more could be inferred about the disease.

From the perspective of daily patient reception, however, the aim for exhaustive data led to complex structures and required more tedious operations in program use. Frequently, the information had to be filed into the database outside the reception hours, often at the end of the day. Slowly the problems in usability then led to declining interest in the program. While this led to the outright abandonment of the program in 8 out of 14 cases, similar problems were reported also in a number of the other programs as well.

The dominant role of the enthusiastic user developers was emphasized among the reasons for continuing the use of the program. By user developer we refer to a doctor or a nurse who was active in the development of the database and then an enthusiast in its use. Their motivation in holding onto the program seemed to be a factor that made up for the mundane difficulties. With one positive exception, the programs still in use resemble the abandoned programs in regard to ease of use and their fit with the work routines. They require significant inquiry and effort from their users in the daily medical practice.

To conclude, one of the main motives for developing diabetes databases was to gain possibilities to make inquiries and to do diabetes research. However, this interest seems to have resulted in programs that do not suit the daily work in the patient reception. Aiming for exhaustive information seems to hinder the use of the programs, and has continuously prevented their proliferation. In many cases it has also led to their abandonment in the initial location.

These results indicate that the problems in PDMS not only stemmed from relations inside the particular project, or that they only reflect general societal laws governing the interaction between certain positions held in capitalist society. There seems to be a similar ending to every story, no matter whether the systems had been created solely by the IT people, only by the users, or in collaborative participation. We find results of this kind indicative of long-term dynamics at play within the sociotechnical processes involved in designing diabetes databases.

5. Power relationships in collaborative design

5.1 Producer–user power relations in the PDMS project

In this chapter, we analyze the PDMS design project from the perspective of power and employ some concepts of Foucauldian genealogy. Obviously, the PDMS design project was based on productive power relationships. In the collaboration, the firm and user participants were self-governing and capable of making their own decisions. They joined in collaboration in order to accomplish their own interests and agendas. The interest of the firm was to achieve a competitive health care information system by utilizing cutting-edge Internet technology. Besides the potential financial profit, this interest derived mainly from the developers' previous experience in designing health care information systems and other databases.

The user participants' desired to achieve an information management system that would monitor the quality of care, put the care recommendations into practice and produce data for diabetes research in municipal and hospital diabetic clinics. The user participants did not get any financial profit for their time and efforts.

The early phases of producer-user collaborations were beset

with contingencies, whereas in the later phases the firm planned its collaborations more systematically. It was accidental that the developmental paths of Prowellness and the municipal diabetic clinic of Oulu converged at a certain point in time. The hospital diabetic clinics were missing from the early cooperation, but the firm recruited them in the later phases. Prowellness changed its collaboration tactics radically after the program became the de-facto standard for diabetes databases in Finland. The firm started to develop similar kinds of databases for other chronic illnesses and sought to open international markets for its products. It abandoned its old way of collaborative design when the number of the user sites grew and the cacophony of their wishes and demands became difficult to manage. The firm started to recruit, exclusively, the leading domestic and foreign medical professionals. The autonomous collaborative design, in which a whole working community was involved, proved to be a limited period in the company's collaboration strategy. The company's rationale was straightforward: collaboration with the leading professionals convinced the buyers of medical databases more easily. The involvement of the former user partners diminished as the firm ceased to incorporate their wishes. Nor did they gain any credit for their past efforts. The firm in turn, had gained a significant amount of free expertise in diabetes care and care practices in general, co-design help in achieving a working program, thorough in-site testing in a number of locations, good references and often direct help in marketing the program as well as good contacts with health care professionals and decision makers in regard to their coming products. The asymmetry between the benefits for the partners is striking.

5.2 Power relations between users, and the firm's role reconsidered

When we look at PDMS only at the project level, it was possible to balance the power embedded in the knowledge of design on the one hand and hand-on experience in medical treatment on the other. Eventually, however, the firm was able to terminate the mutual dependency and tilt the power relation to its own benefit as soon as it had acquired the knowledge it needed. In another words, while formalized PD methods were not necessary in producing a successful co-design, the cautionary lessons about power relations in Scandinavian PD proved more than adequate in this commercial context.

Nevertheless, when we look at the project in the context of diabetes treatment and its database development, we come to perceive that the immediate producer-user power dynamic was but one of the significant producer relations at stake. The graveyard of the abandoned databases bears witness to the fact that the programs were created according to alignments in the power structures in diabetes care. The databases were developed and used as tools to control the quality of the care given, and to aid in the production of

care recommendations and research results.

In comparison with paper-based methods, an electronic database imposes significant constraints on the ways practitioners can act and register information in their patient work. It also improves the ability to monitor their actions. The work routines and arrangements in patient reception vary from one location to another. What is common, however, is that while papers allow more freedom to the way practitioners work, the paper-based work is so firmly embedded in procedures, artifacts, division of labor and coordination that computerization could not enter work routines as an add-on. Computerization almost inevitably causes routines to become more constrained, and local practitioners resist this loss of flexibility and the resulting extra work (see also [9] on the ethnography of the work routines). Usability problems are precisely indicative of the poor fit with the needs of the users. Thus, the database graveyard can be seen as an indication of the conflict embedded in this kind of attempt to crystallize power relations in using.

When we look at PDMS, we notice that the power dynamic among the users was very much the same as in the previous projects. PDMS was designed by the enthusiasts and was made (even more) far reaching in coordinating and enforcing the specialists' way of treating the disease. The wide user participation and skilled programmers were key factors in negotiating and resolving the conflict between the care recommendations and work routines that is inherent in the program's functioning. Most professional groups and stations in special wards were satisfied with the result. Yet, again the battle line remained, only this time with local primary care health centers. The freedom negotiated for work routines by the advanced structure and interface design of the program was not enough for primary care. The benefits from the program use did not compensate for its poor fit. Interestingly enough, it seems that the specialist participants in design were not consciously aware of the conflict and hence saw no reason to consult people in the "lower" level units of medical hierarchy. Their resistance was, and still is, seen as unfortunate and as showing somewhat irresponsible disinterest in the issue.

ProWellness joined the project unaware of the internal tension between the treatment guidelines and the practice of diabetes care. During the design process, the company was subordinate to specialists' views of the program. Through the company, specialists gained a way to further a number of their interests. First of all, with their programming expertise the company provided a way to overcome local work routines by creating an attractive standard means of recording the data. Moreover, the company provided outside expertise to maintain and update the program in the long-run, thus securing and externalizing the standardization of work practices. The

company's search for cost-efficiency pointed towards a single standard matched also the wishes of the specialists. At the same time, the resources of the company were needed to overcome the numerous problems that were bound to arise with the effort to transform the existing local information and bookkeeping systems. Most importantly, company resources for selling the program for primary care (primarily, to the managers of primary care) was most welcome to the specialists. It should also be noted that even if the company did not formally acknowledge the users, their professional colleagues were well aware of who had been active in the PDMS project, which was all that really mattered.

To conclude, when the project is seen in the context of the broader power dynamics in diabetes care, we notice that the user partners were far from being defenseless, or that they derived no benefits from it. Rather we see a shift in the power relations during the project as the company gradually gained independence from the user partners by realigning itself with individual experts.³ At the same time, it became ironically clear that the excluded parties, the non-enthusiastic and non-specialist primary care GPs and nurses are the ones whom the specialists sought to subjugate. While diabetics are but a small fraction of the patients of these professionals, most diabetics are nevertheless treated by them. From the perspective of non-specialist GPs and nurses, the company sought to re-allocate their tight resources to the expensive program, while the specialists sought to reorganize their work routines by adding procedures that mostly benefited the diabetes specialists. At the end of the highly collaborative design project, the fate of the product depended on whether the ones excluded and sought subjugated would have to accept these alignments, or alternatively, whether they would turn their backs on the use of the program. In the best case, there might be a possibility to interest the company and other user collaborators to reformulate the program in the hopes of adapting it to suit the previously unvoiced requirements.

5.3. How to study the power networks of collaborative design projects: the impact of researchers

The PDMS case shows how well-intending and highly collaborative design projects can, in fact, end up promoting systems of inequality. Without a historical perspective, the user partners, designers, companies, or outside researchers for that matter, can support or even strengthen the existing power relations and dominations, such as one user group's dominance over another user group. How, then, can power

³ It is noteworthy that even in its realignment from the locked-in partners, the firm was entrenched in the power dynamics of medical practice in other ways. The purchasing decisions in the medical settings rely on the expert opinion, and thus the company had to realign itself with experts.

networks be recognized and approached? They are hard to discern without a historical analysis, which requires multiple research perspectives and a focus on conflicts. Second, ethnographic study of the user sites, which were silent during the design process, is a beneficial means of gaining access to these networks. Nevertheless, incorporating the ethnographical findings into the ongoing design process may prove difficult if the design process is in its final stages from the perspective of designers, as we found in the case of the PDMS. Third, we recommend researcher-driven interventions, where issues of power and exclusion of some user groups are discussed with the research subjects, even though their impact might be restricted. In our case, the dominant users also dominated the terms of the intervention seminar (for a more thorough discussion see [9]).

6. Conclusions: Understanding and analyzing the contextual dynamics of a collaborative design project

We have elaborated on the context and power relations in a collaborative design project that took place in commercial and product-oriented environment. Partially related to this, we inquired into the effects of the “meso-context” where design projects take place. By using Foucault’s analysis of power, we hoped to gain insight into how the PD’s principles and guidelines regarding power relations fit these concerns.

The first significant finding was that in non-PD informed collaborative design, the specialized participatory design methods may not pose the trickiest challenge for the co-design. The project was able to mediate the transmission of expertise between the participants with relatively simple communication and co-design tools. It was the power and interest issues that ultimately posed problems to the success of the project.

Our analysis of the individual project seemed to repeat the lessons derived from PD: the power relations between the company and users proved asymmetrical. The company disengaged itself from the collaboration as soon as it had a commercially viable program in its hands. Users’ interests in further development and customization of the program were left unfulfilled, and they had very little means to bargain for changes or to renegotiate the price, which they found expensive.

Our historical analysis of the long-standing power relations, or sociotechnical “meso-context” of diabetes care and its databases, showed that the an individual project may be a misleading scope of analysis. We found that previous diabetes databases had ended up on the scrapheap regardless of their location or how participatory they had been. There was an enduring conflict between the care recommendations and requirements of patient work. This contradiction was based on the power relations between the specialists and local health care personnel and crystallized

into the structure of the database programs. The databases constituted an essential medium for the establishment of a productive power network in diabetes care. This was the case also in the PDMS project, which, despite the seemingly broad and democratic user participation (both primary and specialized care units were represented), ended up disregarding the participation and perspective of non-specialized diabetes treatment. In this way the company became entangled in user partners’ power interests, which were to a great extent fulfilled in the project. When we presented our results to the project participants in a seminar, it became clear that the power dynamic was invisible to all the participants in PDMS project, even though they agreed with our analysis. From a Foucauldian perspective, this should not be surprising. Individuals, artifacts and projects often come to embed power relations without being aware of them. In diabetes care, the inherent contradiction was obscured by the seeming joint objectives of all parties involved in treating the disease.

When comparing the lessons offered by PD and our Foucault-inspired power analysis of the PDMS project we see a number of similarities and differences. First of all, both emphasize the importance of becoming aware of the effects of implicit power relations. The hope to achieve harmony among the different worker groups, producers and users (or management and workers for that matter), proved to be a misleading as a guiding principle for collaborative design. Design crystallizes power relations, and it can either resist or further the existing power structures. PD’s conflict perspective promotes awareness of these dynamics by raising power-related issues into the foreground of project work.

Nevertheless, Foucauldian sensitivity to power suggests, as in the PDMS case, that it may be difficult for the participants in PD and cooperative projects to recognize the contextual dynamics that are at play within particular users, organization and technology production constellations. In other words, there is no guarantee that democratic participation can reveal and balance wider, historically-formed power structures affecting a design project, or that formal agreements help in preventing unwanted effects. The crucial issues must first be known before they can be negotiated. Without awareness of the dynamics, well-intending designers and researchers may implement technical solutions that support and further the systems of inequality and subjugation. Such linkages are hard to discern without historical analysis that can reveal recurrent dynamics and hidden developments in work practices. In our case, such an analysis also served as a basis for our intervention and ethnographical study, which we used to make the voice of the silenced and subjugated audible cf. [9]. Their importance and needs are often the ones that will determine the success or failure of the technical project.

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