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Ph.D. Thesis

KEEPING INFORMATION SYSTEMS ALIVE

Participation, work and maintenance-in-use in a welfare department

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I am not only convinced that what I say is false, but also that what one might say against it is false. Despite this, one must begin to talk about it. In such a case the truth lies not in the middle, but rather all around, like a sack, which, with each new opinion one stuffs into it, changes its form, and becomes more and more firm.

***Albert Musil**, Das Hilflose Europa (1922)*

Over the years someone's gone, some others came. This work is for those who remained. Me, for instance.

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INTRODUCTION:
DRAWING THINGS TOGETHER[1] TO DEVELOP A RESEARCH IDEA

"Software and cathedrals are much the same – first we build them, then we pray"
[Sam Redwine]

"Programming would be so much easier without all the users"
[Anonimous]

It has been a while since Barbara Charniawska very effectively defined Information Systems as '*the embodiment of the spirit of our times*' (2005). This quotation might have multiple interpretations, but, to a general extent, it gives an idea of the implications of the rise of Information and Communication technologies (ICTs) on contemporary society.

One may affirm that Information Systems represent kind of frontier field, which is studies by many different disciplines which analyzed the diverse aspects of human and machine relations: Computer Science, Organisational Theory, Science and Technology Studies (STS), Human-Computer Interaction (HCI), Political Science, Management Studies, Information System Design, Sociology and even Environmental Studies. They all contributed to deepen the understanding of information systems development from the point of view of specific social groups and the community which engaged in exploring this multifaceted field.

The direct consequence of this is a broad spectrum of reflections in which one has to find his way to address specific research questions. Indeed, theoretically, methodologically and practically, there are so many options among which to choose that the researcher might either get lost in or benefit from them. Optimally, the researcher should find his own way through the literature and the empirical evidence combined, assembling a personal understanding of theoretical premises, personal re-elaboration and the empirical findings out of the field work.

Focusing on my work, I conceived the research idea before entering the Academy, while I was working as a data analyst in the welfare department of a northern Italian Municipality. There, I was asked to find new accountability solutions to report social workers work on clients. Hence I concentrated on their relations with data-recording software in order to understand how to manage

[1] The title is borrowed from Ehn (2011)

data and to better address the different information requirements coming from the work environment. In doing so, I soon realized that keeping an information system workable and useful for several purposes was evidently not just a matter of software engineering or design, but rather had much to do with its daily implementation in different settings. Approaching and going deep into the literature review, I surprisingly found that the contributions about information systems at work in the domain of social care were fairly scarce. This is particularly evident in the Italian literature, which has mostly approached Information Systems on Social Services (ISSS) from the point of view of policy making, management and public policies evaluation (Palumbo, 2001; Sgritta, 2003). Mauri's work (2007) constituted at that time the only attempt of deeply scanning ISSS structure in relation with the welfare organisation hierarchy. However, once again a specific account of such strategic information systems at work was missing. More recently, some steps towards this area of research have been taken, looking more specifically at the impact that such information devices might have on services supply (Carli Sardi & Barneschi, 2009), without addressing it openly, though. In consideration of this state of the art, the research idea of analyzing ISSS at work seemed to address a rather virgin sector of enquiry – at least at the national level.

Thanks to my past experience, the specific Italian welfare organisation (see Ch. 4) and the encouragement provided by the possibility for proposing a brand new perspective, my research interests – let's say naturally – settled on the Information System on Social Service of Friuli Venezia Giulia Region. Indeed, in this Region, a specific software for clients data recording has been in use for years. Such application, called Digital Social Folder, is managed at the Regional level and distributed across the whole regional territory, with more or less three hundred access points corresponding to the number of the social workers employed in the welfare system. However, to have a definite research field does not imply that the research questions are exhaustively defined. It would have been much more the case if this was an applied research, which it is actually not. On the contrary, the aims at exploring the dynamics through which an information system is kept alive in an organisational context. More specifically, I designed the research so to observe how maintenance unfolds within and across different settings and workpractices, as I am persuaded that this phenomenon has much to do with users-technology encounters. To assume such a perspective permitted me to address the problem of people's participation in systems evolution, which is an other rather unexplored aspect in Information systems literature. Hence, the research project developed from specific questions which can be declined as follow:

What does maintaining a system mean? How is it accomplished in real life? What is to be maintained? What role do users play in such a process? To which extent, if any, does participation represent an added-value in keeping systems alive?

To answer to those questions, it can be useful to first define what this research does *not* focus of. Once accepted that this is not an applied research (although the findings can contain suggestions for further implementations), I should highlight that the aim is neither to provide a manual, nor to indentify 'best practices' to be exploited always and wherever (I am rather convinced that best practices are the 'best ways for doing something' in the practitioners' view). As a consequence, this research does not dare to provide a general and comprehensive theory which can fit each and every similar situation across the world, but it rather aims at reconstructing a situated account on which to build a 'middle-range' theoretical structure, useful as it adds an analytical and interpretative contribution to the already existing body of literature.

On the other hand, I think the research goals can interestingly open new spaces of investigation. Indeed, there is still disagreement about the discourse on maintenance outside the boundaries of Computer Science. Anyway, if one turns the attention away from the technical tasks performed in what is traditionally acknowledged as maintenance, and declines the concept in terms of keeping systems alive (Riggs, 1969), a brand new space for sociological account opens up and enables a more complete understanding of this phenomenon.

Through the analysis of how this peculiar process rises, issues of participation might emerge as well. Once again, we ought to reframe the boundaries of the concept by moving away from the well established conception of participation as an element which is inherently tied to software design (Ciborra & Al., 1983; Karenborg e Stahlbrost, 2008), and shift to the analysis of how people actively take part to the ongoing and emergent developing of systems use. Rather than looking at the participatory stances embedded in a system's structure, the research does focus on how people mobilize their interests in system development (Suchman, 2007; Ch. 15).

To define participation as such, I had to rely on a different conception of the user, too. Whereas the overwhelmingly majority of the literature on users participation follows the boundaries of hierarchical conflict and therefore keeps users distinguished from management and programmers, the field experience suggests that things are much more undefined, showing different commitments towards technology by people positioned differently in the hierarchical and professional structure. These subjects, they are all engaged in system's use and can hence be called – somehow – users. The argument here is that, in the understanding of the phenomenon under scrutiny, what matters is not the label 'user', but how different people and/or social groups actually use the system.

Hence, systems use is the source of maintenance. Indeed, the use is the 'place' in which systems structures get reiteratively enacted in practice, framing and reframing possibility for further actions. This means that use is the source of change and therefore of systems tinkering. Maintenance, is the resulting (and mostly unintended) outcome of enactments combination and interrelations. Such centrality of use with respect to maintenance is the reason why I declined the phenomenon in terms of *maintenance-in-use*. The focus remains on the process of keeping systems integrated in different work realities, but it is linked to the emergent configurations enacted in the daily use of the system. To me, it helps to take equally into account the contribution of every involved actor *combined* with their interactions with technology. That implies of course to move away from the idea of maintenance as a matter of mere code-writing, privilege of technicians only –, a concept I found prevailing in the literature (and mostly intuitive for common people, as well).

Defining the phenomenon in this way means to look at it as it evolves in practice. By moving away from the strategic and managerial approach of activity planning and by rejecting the structural accounts, the epistemology of this research is thus situated and practice-based (Suchman, 1987; Suchman & Al.,1999; Gherardi, 2006). Assuming a practice lens (Corradi & Al., 2009) is therefore consistent with the search of a deeper understanding of maintenance-in-use in the context of technologically dense environments[2] (Bruni & Gherardi, 2007). To look at the materiality of agency indeed contributes to acquire a more comprehensive understanding of what is going on within and across work contexts. Objects, artefacts and narratives are those 'missing masses' described by Latour (1992), constitutive parts of the reality. Hence, assuming an ontological symmetry between humans and nonhumans puts this research in a new perspective, which addresses the agenda set up by Suchman (2007): considering agency as an outcome of provisional assemblages of people and things induces the researcher to account for what happens within such assemblages. In the contests of my research, this means to analyse how maintenance emerges from the assembling and reassembling of elements in the contest of those specific activities which appeared to be at the basis of keeping systems alive (see Chapter 7).

The application of such interpretative concept permitted to adequately take into account the historical development of maintenance-in-use in the context of a multiple system. With this latter concept I refer not only to the idea of a system that is composed by different parts (plurality of the

[2] Although one might question – as Davide Nicolini pointed out during the EASST conference 2010 (Trento 2-4 September 2010) – whether it is possible to talk about non-technologically dense environments anymore.

system), but also to the different configurations in which those parts are enacted. There is not such a thing as "the system" but diverse systems-in-use, differently enacted in space and time.

In my opinion a more complete understanding of how things are performed and elements drawn together can be achieved through the consideration of the specific ways followed by people to both stabilize and question systems at work in their daily life. Moreover, looking at the combinations of actors in practice allows me to look at different configurations in a comparative way. As I will have the occasion to better explain further on in the argumentation, much around maintenance happens contemporaneously in space and time, so that only a combined view can reconstruct what could be defined as common patterns among the different activities which constitute maintenance-in-use.

Consistently with the epistemological premises and owed to the specificity of the information system I was going to analyze, the research had to be based on an adequate methodology. The practice-based perspective of my case study suggested first of all the application of ethnographic techniques. However, the distributed nature of the system required a 'non-traditional' ethnography. Indeed, instead of reconstructing an in-depth account of what was going on in a single environment, my research questions aimed at analyzing the connections and differences among different settings, the processes within and across them, what was flowing and what remained still. Hence, Multi-Sited ethnography (Marcus, 1995) seemed to be the most fruitful approach on this regard. Through a participant observation in four different work environments I thus focused on technology, as well as the materiality of agency, in order to reconstruct different configurations of people and things and I have analyzed them combined.

The work presented here is divided in three main parts. The first one (*Part one*) is dedicated to the literature review and the elaboration of the theoretical framework. The argumentation will thus start with a review of the most valuable contributions already available on the research topic. Thus, in the **first chapter** I will search for maintenance in the literature of different communities of study: I will start from Computer Science, searching for the source of maintenance definition, its conceptualisation and the questionable spaces opened for a sociological reflection on the topic. I will then scan the managerial accounts on strategic alignment, which openly addresses the issue of keeping system functional for organisational purposes. The focus on planning gave rise to several critiques within the Management Information Systems community; I will hence address those opened questions and develop from there the necessity of a shift in the point of view which takes alignment-in-practice into account (Avison & Al, 2004). The third paragraph of this first part will

be then dedicated to one of the concepts which seems to be much closer to my idea of maintenance, and namely design-in-use (Henderson & Kyng 1991; Bodker, 1999; Dittrich & Al., 2002). In the final section I will focus on those works who differently addressed some aspect of maintenance from a more sociological point of view. This will provide the argumentation with some core concepts and fundamental empirical evidence to be exploited in the elaboration of the theoretical framework. It also stands as an encouragement – if ever needed - to explore maintenance at work.

Maintenance is just one of the two concepts the research wants to address, the other one being participation. To talk about it in relation to Information Systems must pass through the elaboration given by Participatory Design community. The **second chapter** of this section will be thus dedicated to the review of the literature on participation, with specific reference to those questionable aspects which are nowadays at the core of Participatory Design community's reflection: to extend the reasoning outside the boundaries of design (Wagner & Al., 2006) and to rethink participation as an emergent phenomenon.

Starting from those contributions and the open spaces for research they create, I will then construct a personal theoretical framework (**chapter three**). Therein, I will first of all define maintenance as an emergent phenomenon based on systems use. I will call that 'maintenance-in-use', a situated and emergent outcome of the relational environments in which the system finds place. Hence, the argumentation will proceed by explaining the worthiness of assuming both the epistemology of the practice and the lens of sociomaterial assemblages (Suchman, 2007; *ibidem*) to account for the research object.

In *part two* I will concentrate on the research setting(s) and the methodology I applied. About the research field (**chapter 4**), a brief description of the Italian Information System on Social Services (ISSS) will be presented together with the main evolution of the Italian welfare system organisation. As I will have the occasion to show more in detail, both welfare services and policy making are in Italy a regional and local matter, so that it makes sense to turn to a specific account of Friuli Venezia-Giulia case. With specific reference to this regional environment I will thus draw the milestone of ISSS implementation by reconstructing the history of the software which represents the main constitutive part of the regional information system: Digital Social Folder (DSF).

In the second chapter of this part I will then outline the methodology of the research (**chapter 5**). Starting from the theoretical and practical specificity of the research field, I will expose the reasons which led me to apply Multi-Sited Ethnography methods (Marcus, 1995; Hine, 2007). After that, I will reconstruct the research path from the field access negotiation to the reflexive process of

shaping ways to collect data, from participating in the contests to the ongoing analysis of transcripts, from the cross reading of differences and common features among the different geographical settings to the construction of a unified account.

In the *third part* we will enter the research findings section, which is subdivided into four main sub-paragraphs. **Chapter 6** concerns the more descriptive part of the field results: it starts with the analytical deconstruction of the DSF, stressing the characteristics that make this system multiple. Subsequently the narrative proceeds by putting the system in motion in a social worker's typical working day. This paragraph serves as a rhetorical device in which I assembled different experiences into a single account to enhance the most interesting features of DSF at work. Thereafter (**Chapter 7**) the argumentation faces the different activities which emerged to be at the basis of what I called maintenance-in-use: from the steering group activity at the early stage of implementation, to the daily workaround of classifications, passing through the connections individuated by the 'technical support' and data checking. I will then dedicate a section to the objects, assuming the specific point of view of the different technologies involved in the diverse activities and highlighting their fundamental role in shaping the courses of action. At the end of the chapter, some tenet on maintenance-in-use will be then pointed out. In the last two chapters I will finally develop a more analytical reflection. In **chapter 8** I will assume the point of view of assemblages to account for the maintenance-in-use as it emerged from the field, whilst in **chapter 9** I will develop, on the base of ethnography outcomes, the renewed perspective on participation and users contribution to Information system maintenance.

In the final chapter I will go back to the research questions and the theoretical standpoints and look at them in light of the field work. I will then point out what the valuable contribution of the perspective carried out during the last three years might be. In conclusion, I develop some open-ended questions that might leave spaces for further investigations of what could be assessed as a new perspective of lively system in different contexts.

READER'S GUIDE

Before proceeding in the analysis, I would like to provide the reader with some explanations about the contents and the forms of writing I deployed. I hope they will make the reading smoother and clearer.

First of all, there are two terminological issues to clarify. The first 'problematic' term is 'client', which is used to identify anyone receiving benefits from the welfare departments: interventions set up by social workers and homecare assistants (e.g. colloquia, support, homecare, and so on) – the so-called 'professional interventions' – , and the diverse funding which do not necessarily involve social workers – the 'administrative interventions'. It might be tricky for the Italian reader is to accept the term 'client' for 'utente', but, translating 'utente' with 'user' is not only wrong in this field, but it could confuse the individuals it refers to with the information system users. I also chose to avoid an other word close in meaning to 'client', and namely 'patient'. The latter refers to the healthcare domain, which is largely independent from the social services area of intervention.

Apparently inconsistent to what I just stated is the deployment of the second 'tricky' term, namely 'diagnosis'. I use it in the text just because the specific Digital Social Folder (DSF) item dedicated to clients' problems is denominated this way. The term in itself belongs to the health domain but, perhaps due to the system implementation, it entered the vocabulary of social work. I can not say whether it is used outside Friuli Venezia-Giulia or not, but in this Region it refers to both the DSF section and the clients status.

At the time of writing, an other problem emerged, namely the respect of the privacy of people encountered in the field. I decided not to cite their real names, but I soon realised abbreviations are too difficult to remember. Hence, I decided to give them fantasy names. Since such a choice is inherently arbitrary, I decided to use different languages for different social groups names: social workers and social assistants have been assigned Italian names; middle-range profiles such as District Managers and Digital Social Folder's Referents (all of them belonging to the District level) 'earned' a French name; finally I gave to programmers and Regional personnel German names. I decided not to distinguish between the programmers and Regional employees because they all represent the regional-level side of the welfare system. I want to make immediately clear that this classification does not have any analytical implication, but it is simply a rhetorical device used to make things more accessible. To introduce a larger number of categories (and therefore languages) would have perhaps been confusing.

A third issue concerns practitioners quotations. Obviously, the original transcripts are in Italian. Yet, for consistency purposes, I translated them into English in the text's body. I tried to be the closer to the original as possible, but it has not been always possible, for two main reasons: first of all, people sometimes uses hackneyed phrases, dialectical expressions and puns that are difficult (if not impossible) to translate; secondarily, not being a native speaker, I had to cope with my limits, so that somewhere I privileged the meaning instead of an accurate translation. Anyway, I am convinced to have preserved quotations meaning. Italian readers can easily skip to the original transcripts I reported on footnotes.

The reader will not find dates connected to the numerous quotations in the text. It has been a deliberate choice justified by simplicity: the chronology of the field notes is indeed analytically nonessential, whilst to cite dates would have most likely slowed the reading down. Whenever the temporal frame is of any interest, there the reference has been added.

Finally, as far as abbreviations and acronyms are concerned, I tried to combine clarity and simplicity as much as possible. Yet, if my attempt failed and the reader gets lost, I have provided an abbreviations table at the end of this document. Please forgive the writer and refer to it.

ACKNOWLEDGMENTS

It could seem obvious to say, but it is not trivial for sure, that if this work is of any worth, it is thanks to the people who supported, encouraged and advised me in various ways during my Ph.D. Naming all them would be a long list, but from the mere point of view of this work I would like to public thank first of all my supervisors, Prof. Vincenzo D'Andrea (University of Trento) and Prof. Lucy Suchman (University of Lancaster). For the invaluable suggestions, reviews and support I am also grateful to Prof. Silvia Gherardi and Attila Bruni (University of Trento), Prof. Claire Waterton and Karen Broadhurst from Lancaster University, and to Prof. David Hakken (Indiana University). For the time spent reflecting together or reading this document's draft a special thanks goes to Maurizio Teli and Stefano de Paoli from Ahref Foundation, Giacomo Poderi (University of Trento) and Ingmar Lippert (Augsburg University). Finally, I cannot but thank the Trento University Information Systems and Organisation fellows and Lancaster Sociology Departments Ph.D. students, with which I had the opportunity to confront during the past three years.

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Last but not least, I am grateful to Luca Marcolin (University of Leuven) for the invaluable effort of proofreading this work. If the reader can walk through this thesis is also thanks to his English review.

PART ONE

INSIGHTS ON MAINTENANCE

* * *

The first part of this work aims at framing the research object and drawing the contour of maintenance . In doing so, I first of all search for its meaning in the different streams of literature which, more or less explicitly, investigated for it. Being the studies of Information and Communication Technologies (ICTs) inherently cross-curricular, there should be no surprise if the path I am going to follow shifts from Computer Science to Management Studies, from studies on Information Systems Design to Science and Technology Studies, from Ethnometodology to Phenomenological accounts.

The reasons for these shifts in epistemological approach are essentially twofold: on the one hand, the topic of information systems maintenance seems to me just partially addressed by each discipline, and the literature directly addressing the problem appears to be anything but abundant; secondarily, the traditional conceptualisation of the phenomenon does not leave me satisfied, and therefore I reviewed different approaches so as to elaborate with a personal concept of maintenance.

Since the research questions does not only address maintenance in itself but in relation to users role in shaping it, a dedicated review will focus on how users and participation found their conceptual definition in Participatory Design works[3].

Whereas the first chapter encompasses a reasoned literature review, in the second one I sort things out so to build the foundations for a sociological account of maintenance as a dynamic, relational and situated process. I will look at it through the lens of the practical recombination of different sociomaterial assemblages, mobilized within an ecology of practices. This epistemological standpoint will allow to look at users and participation in a different fashion. Indeed, to privilege a situated and inductive account will lead to reframe both concepts borders.

[3] I will not only refer to Participatory Design, but I cite it here because it represents the reference community for sure.

1. SEARCHING FOR MAINTENANCE IN DIFFERENT STREAMS OF LITERATURE

In order to approach an unfamiliar phenomenon, the first thing to do is perhaps to try and define it. What I am going to do hence is to reconstruct the meaning of the term 'maintenance'. In my understanding maintenance guards different shades of significance: although maintenance is mainly used under the acceptation of technical intervention, in the literature I am going to review the term also appears under different meanings.

A good practice would thus require the clarification of the literal extent of the term. According to Oxford English Dictionary, 'to maintain' (something) means to "*cause or enable a situation or a condition to continue"*. More specifically about a machinery, it specifies "*to keep* [it N/A[4]] *in good conditions by checking or repairing it regularly*"[5]. Synonyms of 'to maintain' are 'to keep' and 'to preserve'. Interestingly, the term is used with reference with both artefacts and non-material things, such as relations, peace, and so on[6]. Much more orienting is the noun 'maintenance', which obviously directly derives from the verb. Once again Oxford Dictionary says it refers to "*the process of preserving a condition or situation or the state of being preserved*" and also "*the process of keeping something in good condition*"[7]. In Italian, the translation of the different nuances of the term 'maintenance' is twofold: on one hand we have 'manutenzione', namely the set of operations which keeps something in good condition, on the other 'mantenimento', which refers to the action of keeping something maintained. This double translation does not help in individuating a univocal definition, but rather helps to understand that the applications of the noun are multiple.

Moreover, as we will see in the next pages, in the body of studies we will review, a third acceptation could be found, in which 'maintenance' identifies the last phase of an information system's life cycle. But this is not enough, either, to cover the different nuances displayed in the literature.. The following table sum them up.

[4] N/A: note by the author.

[5] http://oxforddictionaries.com/definition/maintain

[6] http://www.wordreference.com/iten/mantenere

[7] http://oxforddictionaries.com/definition/maintenance

Tab.1: Different acceptation of 'maintenance'

DISCIPLINE	**PHASE**	**MAINTENANCE (ACTION)**	**MAINTENANCE (INTERVENTIONS)**
Information Systems development	- Post -implementation - Review[8]	- Perfective interventions - Adaptive interventions - Support	- Application maintenance* - Systems audit* - Corrective intervention - Bugs fixing
Management Information systems		- Post-implementation management* - Strategic Alignment	

Source: Edwards (1984)

Edwards (1984) says that this terminology's abundance is mainly due to the increasing degree of specification the topic gained by the years. Despite that, a more satisfactory and broader definition could be found at the very beginning of Computer Science history. Indeed, in 1969 Riggs wrote that:

> "*System maintenance is the activity associated with keeping operational computer systems continuously in tune with the requirements of users, data processing operations, associated clerical functions, and external demands*"

I want here to 'house' this definition because, despite the time past by, such definition represents the complexity of the phenomenon as I understand it: an activity which develops over time, and encompasses either the technical functions (*data processing operations*) and users claims (*requirements*), management needs (*clerical functions*) and the interaction with both the organisational inside and outside (*external demands*).

With such definition in mind, I can then start to review the contributions on the topic. The first passage is to account for how the computer science community framed the issue of maintenance; then we will look at the managerial approaches to finally come to all those works that could be framed under the label of 'design in use'.

[8] Later on in this work the reader will found Post-implementation review as a single label, whilst here the two terms are separated. The only reason for that is that here I refer to two different moments individuated within a specific life cycle's phase; Post-implementation reviews are, on the contrary, managerial tools for system evaluation (see Ch.1.1)

1.1. THE COMPUTER SCIENCE APPROACH

In computer science literature, one of the terms used to individuate system's maintenance moment is 'post-implementation'. Such label – and the related analytical implications deriving from it – emerges from the specific approach to system's life cycle typical of those methodologies variously called 'conventional systems analysis', 'traditional systems analysis', 'systems life cycle' or 'waterfall models'. Generally speaking, all those can be ascribed to the System Development Life Cycle (SLDC), the principal methodological and theoretical frame developed from the fifties to the late eighties in system's development, (Avison & Fitzgerald, 2000). According to it, system design and implementation are constituted of at least six passages: a) Feasibility study; b) Context analysis; c) System analysis; d) System development; e) Implementation; f) Review and maintenance (*ibidem*, p.20).

Aiming at presenting and describing system's life cycle, the authors particularly focus on the first four phases, namely the design. It thus seems that the last two, although listed for completeness purpose, are cut dry from the formers, put aside from the development path. Such separation is almost 'ratified' by the evidence that "*the design and coding of the programs will normally carried out by computer programmers* [whist, N/A] *analysis and programming functions are considered separate tasks carried out by different people*" (*ibidem,* p.26). Hence, not only different phases are clearly separated one the others, but there is a gap between system building (a programmers affair) and its implementation, performed by different people, too.

In view of the state of the art, if one wants to focus on maintenance, one has to look at what happens after the system development. Authors say that the 'Implementation' phase (e) generally concerns the tasks of testing systems parts, bug fixing, personnel training and documentation release. Whereas an older system is working in the organisation, there a period of *parallel running* is suggested. It still is questionable, however, what the last phase is constituted of and which tasks and professional skills are deployed therein. Always in reference to Avison and Fitzgerald (*ibidem*), one can state that the last 'step' begins as the system becomes operational. On a general basis, computer technicians are carried with maintenance interventions, in order to guarantee the system's efficiency. Their main task is thus to fix bugs which did not emerge in the implementation phase. Such an activity has to take into account both internal and external changes, along with the evolutions of technological innovation, in order to review the system when it does not satisfy the requirements individuated in the feasibility study phase. If organisational changes can be addressed

by implementing compatible updates, then an evolutionary maintenance is performed. Otherwise, system's life cycle is considered exhausted and a brand new cycle is opened to develop an other system (*ibidem*, pp. 28-29).

Reasoning on this approach to system maintenance, it emerges as a definite step of a linear path. Tasks and functions are rigidly prescribed, and each and every professional figure has its own. The clear cut between design and implementation draws a discontinuity which it is not merely about timing, but is conceptual and operational, too. It raises a 'rift' which acts as a 'point of no return'. Users barely enter the scene, taken into account as far as training to systems functionalities is concerned only, , as if they were a jigsaw piece in search of its perfect positioning in the work process.

Thus, it is not surprising that maintenance is mostly interpreted as the set of performed punctual activities. As such, maintenance can be defined as a variation of one or more system's elements, so as to either enhance the system's functionality or solve an element's defect. (Edwards, 1984). Elsewhere in literature the point is developed in more general terms, individuating another distinction between what can be defined as *normal* activities and those which are, on the contrary, specific emergent answers to occurred problems (Swanson, 1976; Bratteteig & Al., 1991).

In order to keep systems aligned with organisational requirements, specific evaluation and review tools have been developed over the years. In the next paragraphs I will focus on 'Post-implementation reviews' (PIRs) as a paradigmatic example of such a toolkit.

Before that, anyway, it is perhaps most useful to proceed step by step into the understanding of maintenance as it was developed in the computer science community. I will first look at the activities performed inthe post-implementation phase.

The most popular among the classification of maintenance-related activities was proposed by Swanson (1976), who distinguished potential interventions in relation with the change (or problem) they are asked to face. There are therefore:

1. *Corrective interventions*, which are modifications set up to fix errors in functionalities risen during the design phase. These are originated by either faults in the development process, or incomplete elaboration of requirements, or finally not-better-defined failures during the implementation;
2. *Adaptive intervention* which, instead, are enhancements set up due to a technical change or pushes coming from the organisational outside. They are deployed in case of modifications of either data production environment or in the processes which imply hardware or software changes;

3. *Perfective intervention*, finally, which aim at enhancing the system with respect to organisational internal requests. They may rise from changes in work processes or in management strategies.

As Bratteteig and colleagues pointed out (1991), the first of these tasks deals with the technical quality of the system, and it is the one which is generally acknowledged as 'maintenance'. Adaptive and perfective interventions are on the contrary related to the functional quality of the system, namely how the latter keeps addressing desired requirements. According to the same authors, this conceptualisation relies upon the idea of information systems as 'finished' products once the design cycle releases them, so that extraordinary interventions performed during post-implementation are nothing more than punctual events set up on occasion to add on or modify a 'taken for granted' system.

In other words, the information systems is not questioned anymore. Bugs are hence considered despite of practices of use, disconnected from workflows, and rather traced back to technical dysfunctions which had not emerged during the design phase, whose solution is demanded to computer technicians. Looking closer at this model, users are simply left aside: there the focus is on business processes (which concerns the management), i.e. no longer a matter of users technological enactments, as it might seem.

This holds for ordinary interventions. As far as extraordinary activities are concerned, i.e. the ones which enhance the system and keep it close to organisational strategy, the finished system is not questioned at all; as Avison and Fitzgerald (2000) pointed out, information systems are considered functional as long as they address requirements, and that is the main reason for perfective and adaptive intervention to be set up. However, in case modifications are not sufficient to solve the problem (or, I argue, when updating the system is not worth the effort), a *new* cycle of a *new* system takes place. Pushing the argument even further, in case the system's integrity is undermined, then it is preferable to start the process from the beginning once again.

Perfective and adaptive interventions, as in the ordinary maintenance, leave users aside, for they are implemented by analysts and management together. Moreover, in doing so, programmers are cut out of the process, as well (Walsham, 1997).

POST-IMPLEMENTATION REVIEWS

If the above-mentioned idea of maintenance is somehow preservative with respect to the designed system, there is also a 'big family' of procedures which is specifically developed to

evaluate, test and modify the implemented system. It is the case of systems' *review*, which in Avison and Fitzgerald model stands as a counterpart of maintenance (2000). Actually, the literature attributes a double meaning to it : on the one hand, review individuates the discharge of the system once the environmental changes are too strong and it is impossible to intervene on the existing tool to adequate it to the new requirements. On the other hand however, the term is used with respect to those evaluative moments – set up while the systems are already working – that do not necessarily lead to system discharge (Kumar, 1990). In the Information Systems Management literature, those moments are called *Post-implementation Reviews (PIRs)*, borrowing the label from the family of tools used to evaluate the system.

PIRs are extraordinary activities (mostly once in a system's lifetime) and they consist in "*measuring the actual impact of IT project in business performance*" (Farbey & Al., 1995). This definition applies to the so-called *ex-post* or *'summative'* reviews, namely those set up after the implementation, whilst an other family called '*formative*' reviews specifically evaluate the design process (Remenyi & Sherwood-Smith, 1999). For these, Farbey et al.'s definition does not work very well. One of the most detailed description of such a combination of tools and tasks is presented by Kumar (1990) who analyzes various different attempts of PIRs from the beginning of the Seventies to the end of the Eighties. Although the reference may seem out-of-date, it nonetheless remains a standpoint for most of the articles reviewed on this topic. Moreover, the argument is carried out linearly and in detail, making it adequate to the descriptive purposes of this paragraph. Hence PIRs:

1. are generally carried out either immediately after the implementation (formative PIRs) or just before migrating(switching?) to another system. In other words, whereas PIRs are set up after the implementation, they overwhelmingly lead to system abandonment. As a consequence, , they act as an evaluation tool for systems failure more than for systems functionality (Kumar, 1990). Therefore, no wonder if fifteen years after Kumar's study, Gwilling and colleagues stressed the gap between the prescriptive ways of performing PIRs and the real-life application of the tool (Gwilling & Al., 2005). Indeed, although PIRs are strongly recommended by managerial scholars as useful tools for systems evaluation, they are rarely exploited by firms' managers – the true addressee of PIRs ;
2. involve different organisational levels, from the development team to the strategic management, from the operational monitoring group to programmers, etc. *but not the users*;
3. are based on standardized tools for data gathering (mainly questionnaires) designed by the control team. Looking at the main areas of interests that such tools encompass, one may find

information accuracy and timeliness along with requirements adherence, but surprisingly enough the adherence with organisational processes, the impact on users' work and the operational costs are just left on the background (Kumar, 1990).

Hence, assuming the user's point of view – which is the focus of this research – PIRs reveal to sort of tool for isolation, since workers role is mainly passive (questionnaires fulfilling, in this case). Not only systems alignment with workpractices is not taken into account, but users are also excluded by the review workgroup, excluding them from the possibility to embed their needs into the artefact.

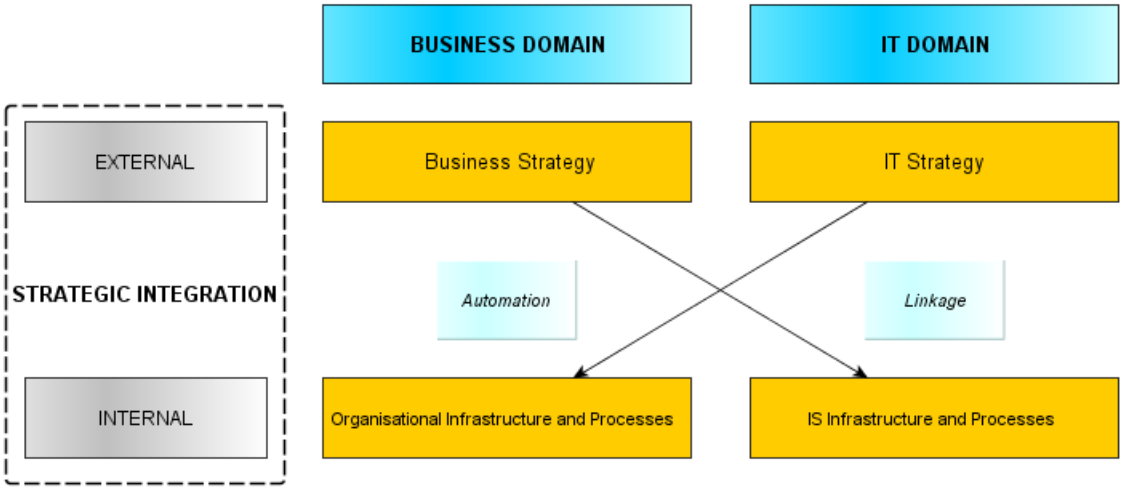
1.2. STRATEGIC ALIGNMENT AND MANAGERIAL ACCOUNTS

Acquired the critique I moved in the former chapters to the idea of punctual interventions, these latter could all be nonetheless considered as forms of keeping the system in tune with environmental changes. After the specific computer science accounts, I dedicated a paragraph to PIRs, managerial tools set up in the context of 'technical' perspective of maintenance.

This topic has been extensively documented also in the managerial studies. On a general basis, Information systems management community considered it in terms of *Strategic Alignment* (SA).

The point of reference around which a considerable part of such literature turns is the Strategic Alignment Model (SAM) presented by Henderson &Venkatraman (1993), which I reconstruct in the picture here below.

Picture 1: Strategic Alignment Model (SAM)



Source: Henderson &Venkatraman (1993), author's rework

To briefly summarize the authors' argument, both business and infrastructure domain ought to face internal and external pressures. In doing so, they are called to coordinate each other, either on their structural configuration and on the processes flowing between them. Such a cross-domain integration relies upon automation and the connection among informative solution and the business process. Declined as such, alignment is a process dealing solely with organisational and infrastructure management, so to say it is accounted under the acceptation of 'planning' (Burn & Szeto, 2000).

Given the model, Henderson e Venkatraman (*ibidem*) hypothesized different scenarios according to whom, between business or infrastructure domain, leads the way of alignment. From here, different configurations become possible, depending on the aim at either internal re-configuration or external adaptation. Whatever the case, this effort should point to maximise information systems' efficiency and efficacy, exploiting technological affordances at best.

This rather clear theorisation has been questioned from the managerial community inside, so far. For example, as Avison and colleagues (2004) pointed out, the main criticality consists in the fact that, despite the abundant documentation on SA, the concept in itself remains still unclear. In addition to this argument, this work is particularly interesting because it reviews the critical outcomes rising from diverse attempts of testing the SAM. Since I do not aim at in-depth analysing the SAM critiques, I will rather take some of them that I consider functional to the argument that I am carrying on.

A first element of interest questions whether or not it exists a link between the act of planning and the concrete accomplishment of alignment. Indeed, just rarely the effective unfolding of action follows the railroad of modular strategizing: managers could actually classify their strategy in terms of linear relations, but they are eager to reconstruct such a map in the practice of alignment (Ciborra, 1997). As a matter of fact, the flourishing of SAM accounts directly led to ignore how alignment comes into being in practice (Avison & Al., *ibidem*; Bergeron & Al., 2003).

An other critical question challenges the effective capability of management to timely modify information technologies in times of increasing flexibility and uncertainty. If it is not the case, which meaning could possibly assume the management of SA? As Maes (1999) argued, to concentrate on aligning strategies diverts attention from technology's evolution or, diversely, leads to misconceive technology as an intervening variable.

On a third stance, there is the epistemological problem of considering SA either a product or a process. From the SAM model indeed, alignment rises as a static element within organisation, and

that turns to be the most popular position within the managerial community, despite some interesting attempts of process-oriented studies are recently emerging (Avison & Al., 2004). Anyway, to focus on alignment as a product implies ideal typical models set up to plan organisational strategies directly aimed at achieving the alignment's goal. Consistently with that, organisations should be based on rationalistic principles of action that would develop according to structured plans. Therefore, little surprise if most of the SA studies show how the goal of alignment got just rarely achieved (Smaczny, 2001)

If one shifts away from this perspective, the methodological point of view should choose for a different analytical lens: leaving on the background the idea of planning products through the deployment of strategies-on-paper, one might envision the SA as a continuously negotiated element, so to consequently focus on whatever enhances or stunts alignment in its unfolding (Luftman & Al., 1996).

Two different visions thus underpin the opposite approaches: on one hand a rationalistic perspective investigates planning contents, on the other, a more socially informed one looks at people who constitute alignment. The lens through which I am going to look at such phenomenon is just the latter. In addition to that, I want to open up the horizon of people involved by widening the enquiry not only to management and technicians but to users, too, all those subjects that have been 'silenced' in the mainstream accounts of both Computer Science and Information Systems' Management.

What my argument preserves of the reviewed debate is the budding interest toward the processual dimension of alignment combined with the challenge of finished computer systems. Honestly, both aspects still seem to me encaged in a prescriptive envision of the phenomenon, being them enrooted on strategizing and modelling on the one hand, and concluded into the stiff boundaries of technological affordances, on the other.

To sum up what encountered heretofore, I first of all reviewed Computer Science's works and then I moved forward looking at managerial accounts of alignment. Talking about the first, maintenance is accounted as a sum of punctual technical interventions, set up as emergencies occur and performed by computer technicians, skilled people who manage the code. Those interventions have been categorized according to the source of the problem (bugs, internal and external demands) and the goal to be reached through the modifications: preservation in case of bugs fixing, evolution, adaptation and enhancement in case of changes in the software induced by the organisational environment. Briefly generalizing, I can end up by saying that those changes are management-

induced and accomplished by skilled IT[9] personnel. The main criticisms pointed out hence concerns the fragmentation of what I rather see as an ongoing process and, most importantly, the marginality of users, which are taken into account exclusively as people who undergo the development, with no clear role in shaping the system's evolution trajectory.

Whereas 'traditional' computer science accounts neglect the ongoing nature of software development, management studies acknowledge the evidence of a mutual interdependency of organisation and technology over time. That represents a step onwards from the technical understanding of maintenance, which is variously addressed in terms of Strategic Alignment. The specific standpoint from which this approach takes into account software's development is indeed declined in terms of strategies for managing organisation-technology co-evolution. Nonetheless, as Avison and colleagues (2004) noticed in their review, a relevant criticality of this perspective is that it counts users out of the focus. Reviewing strategic alignment works, those scholars questioned the lack of a practical accounts about how the pretended goal of alignment has possibly ever been achieved in practice. Either that or it is not a goal but better a process. However, this stream of works neither aims at accounting the work needed to make system work within contexts, nor it cares about people and their encounters with technology, which, on my side, I consider a fundamental step to understand how system are maintained alive.

To overcome this position I will now look at a particular information system design's stream which developed a more social and processual perspective of organisation-technology relations.

1.3. DESIGN, USE, DESIGN-IN-USE

In this section I will now review an other group of works that specifically addressed the topic of systems' changes with reference to their use. In doing so, I will turn the attention away from both the technical dimensions of maintenance and the discussion on strategic management of Information Systems' evolution. The contributions I am about to review will hence take the reader closer to the concrete use of computer artefacts. In this section I thus get together several works belonging to Information Systems Studies, Computer Supported Cooperative Work and Participatory Design. To me, they all share two fundamental principles which draw them away from what already seen in the former analysis:

[9] Information Technologies.

1. they all reject the assumption of a discontinuity between what is traditionally conceived as 'design' and what comes after (Avison and Fitzgerald, 2000), being it called 'implementation', 'post-implementation', 'software's review', 'maintenance' or whatever;
2. at the same time, they are all based on the idea that systems' life cycle not only depends on management and programmers skills and activity, but they equally take into account users encounters with technology. Moreover, they all argue it is from the relational movement among these three groups (management, programmers and users) that some kind of change in software may happen.

Anyway, these two characteristics are not sufficient to individuate a single stream. On the opposite, they act as a cap for diverse approaches, in which the ongoing shaping of technology and organisation/work is differently conceptualized and variously labelled.

Owed to the aims of this review, I want to draw a preliminary line to subdivide the literature I am going to scan: although all the papers are actually based on the relation between design and use, some of them concentrate on the design phase, whilst the others focus on systems at work. In other words, the first group questions how to *build systems for the use*, whereas the second one addresses the topic of *design in use*.

The distinction between these two processes has been made explicit by Viviane Folcher (2003) in her study of a network and telecommunications specialized call centre. She argued that two connected process were noticeable in her field: "*'design-for-use' which culminates in the production of a shared database as an artefact dedicated to a collective; and 'design-in-use' which materializes in operators' development of their own instruments to serve their individual activities*" (p.649). Hence, design for use focuses on the design process and questions the ways in which systems could be possibly been built for enhancing their use; on the opposite, design-in-use focuses on both the processes of appropriation that users may perform and the modifications emerging from that. However, the author does not provide the reader with a clear definition of what design-in-use means, it shines clear that it belongs to systems at work, whilst design-for-use belongs to the design phase only and finds its core in the cooperation necessary to build workable systems.

True, Folcher used both terms in a quite specific declination, according to her field's findings. I take here the more general distinction between design-for-use and design-in-use to highlight some analytical standpoints. On a general level I might push the argument further and say that, whereas design-for-use is much more design-oriented, aiming at improving systems design's process, design-in-use is much more use-oriented, so to say it focuses on systems' use and its implication for software's change. It is nonetheless important to stress that both groups *are based on the analysis of*

an already implemented technology; the first reflect on how to do improve the design, the second on the software's ongoing modifications.

To the first group I want here to cite Bødker's 1999 work, which is one of the first to apply the term design-in-use. The author analyses computer artefacts as mediators between design and use in a developmental perspective. Therefore, her work is mainly theoretical. A specific section is dedicated to design and use, and that is precisely the one I want to concentrate on. In my understanding, the perspective she took positions her work much more on the 'design side' rather than on design in use. Indeed, she wrote that "*development in and of design and use needs to be dealt with throughout the existence of a computer application. This development needs to be anticipated as best as we can, despite the unanticipatory nature of computer applications*" (p.43) and, further on, that this perspective should be taken into account to reflect on "*how should practically impact our ways of doing design*" (*ibidem*). Hence, the reference to the design is clearly stated. What is worth for the argument I am carrying on are the standpoints on which she grounds her reasoning, and namely (pp. 43-44):

1. design is inherently multi-practical and therefore is important to support the cooperation between various groups of users and designers;
2. design must be carried out in ways that give to the users the possibility of experiencing the future;
3. design must be carried out so as to understand present, past and future uses, and must seek both theoretical and empirical inspirations;
4. design must be based on the understanding of how use may develop, and how it interacts or may interact with other activities;
5. design must be based on a use-oriented understanding of the computer-based materials worked with;
6. design must be creative and innovative;
7. design must be carried out in ways that allow designers to be concerned with their own tools and practice;

What is central here is the definition of design in relation to the broader environment in which the system finds application. Bødker took into account the multiple practices enrolled by different communities and argued that they have to be put in cooperative relation; design should leave spaces for future developments *on the basis of* a clear understanding of the settings (in terms of both people and things); being relational, design should not only fit users' practices but the

programmers', as well. In this sense, the process is taken into account from multiple points of view. Finally, and perhaps most importantly, design ought to fit use as it is *understood*, not *imagined* like the in traditional development's cycles (Avison & Fitzgerald, 2000).

The very attention on design for use is noticeable in other two related works which assume the point of view of users with reference to systems building. Both of them refer, implicitly or not, to De Sanctis and Poole's Structuration Theory (1990), and they hence stress the centrality of technology's appropriation by the users.

This is exactly the focal point in the study of Xerox placeless documents held by Dourish (2003). The author starts from questioning how software can possibly sustain appropriation processes, and therefore which characteristics should designers embed into the systems. Hence, he explicitly assumes the issue "*in terms of technical features that support it* [the design, N/A]" (p. 465). Far from being a 'traditional' requirements analysis, the central element in author's argument is the acknowledgment that the appropriation process relies on workpractices – he says "*is a matter of practices*" (p.484) – and that, while adapting technology to ways of doing, workpractices themselves evolve. Thus, the relational movement between technology and practices comes into stage, and that is the most interesting point I got from the paper. Anyway, I position this work inside 'design for use' group because, I argue, it does not deepen the potentiality for ongoing systems' evolution but it rather aims toward, as the author himself pointed out in the conclusions, "*a theoretical account of the process of appropriation, and a foundational understanding of the consequences of technological design, are necessary if we are to be able to produce software systems that fit more naturally into adaptive patterns of practice*" (p.487).

Directly referring to this latter work, Dix (2007) pushed the argument of appropriation further on the side of programmers, questioning how designers should proceed to come up with systems "*designed to allow the unexpected*" (p.27). His argument starts from the evidence that potential uses (appropriations) are unpredictable at the time of design and therefore to design for appropriation seems to be an oxymoron. Following the author, the point is then to design to let appropriations 'naturally' happen in the context of flexible systems. The most interesting point in his work, at least to my research, is the attempt to sort out some characteristics which designers should take into account. Among the others, I recall here (pp. 28-29):

1. *To allow interpretation*: don't make everything in the system or product having a fixed meaning, but include elements where users can add their own meanings;
2. *To provide visibility*: make the functioning of the system obvious to the users so that they can know the likely effects of actions;

3. *Support not control*: instead of designing a system to do the task you can instead design a system so that the task can be done;
4. *Encourage sharing*: people are proud of their appropriations of technology. If the user learns a good trick for using an application or device, then this may be useful to others as well.

Transparency, interpretation, support and sharing are hence central to build systems that smoothen the achievement of users tasks. Unfortunately, the author does not seem interested in showing up the implications for post-implementations dynamics, although the acknowledgement of change is well explicated from the very beginning of the paper. On the opposite, he ends up by stating the need for designing systems' boundaries which can be (re)designed by the users when the context of use expands.

In the same group I can also cite Dittrich and Lindbergh's 2003 work, in which the authors coined the label of 'use-oriented development' to individuate more or less the same principles reported in the other papers, and namely to design so to enhance potential uses. Interestingly, their focus shifted outside the boundaries of mere design. Indeed, they said that this orientation toward systems' development has to be put in practice with the deliberate aim at facilitating user-developer co-operation. Thus, authors explicitly moved in the domain of everyday systems evolution.

That is the reason why I see this latter work as a bridge to the other big area of interest in which I decided to split this section's review. Indeed, whereas 'design for use' still maintains the focus on design, the upcoming works clearly aim at deepening the understanding of that ongoing process of system's rework which I labelled 'design in use' (without hyphens). True, the label is not mine, because different authors used it before me (e.g. Henderson & Kyng, 1991), but I assume it here as a broader cap that covers diverse definitions of similar phenomena. Indeed, there are several different definitions that could be positioned underneath.

First of all I would take Moran (2002), for he introduces a very interesting definition of design. According to him, "*design is a complex concept that is not limited to a particular role in the development process. Rather it is a set of distributed activities of different kinds by different people at different points in the life cycle of interactive systems*" (p.15). Central to me is here the idea that design is not 'owned' by designers only. Moran call this latter conception of design 'professional', whilst opposing to that the 'Everyday adaptive design', in which people adapt resources at hand while using the system.

Hartswood and colleagues (2000), on their side, they also tried to address the gap left open in Participatory Design literature, and namely to consider design in use. In doing so, they stated the necessity of a "*partnership between IT specialists and users that extends over the whole*

systems lifecycle, and is grounded upon what happens as users grapple with the problems of applying IT" (p. 96). They argue that the first step to be done is to move away from a traditional conception of design as a concluded phase to acknowledge it as a process taking place over time and in different contexts.

Fisher and Ostwald (2002) coined the label 'Evolutionary growth' to indicate the process of continuous system enhancement based on the incremental acquiring of ownership users get using the systems. Given that, the authors apply the metaphor of systems as seeds that are able to evolve. What 'nurtures' that seed is the informed participation of users. There are hence two main point that I would like to sort out from this work: first of all, the rejection of differences between design and implementation-related practices, because – and that is the second element – they both share the common ground of users' participation: finally into stage, users act as the source of change.

Dittrich and colleagues talk instead of 'Everyday co-development'. The idea at the core of the reasoning is that implementation 'stands on the shoulder' of multiple interdependencies, and is hence crucial to build organisational structures to sustain "*working relations of technology production and use*" (2003, p.11).

Anyway, what seems to me the most central work to be taken into account is the 2002 article from Dittrich and colleagues presented at the Participatory Design Conference in Malmoe. There, the topic of design in use is more completely and directly taken into account. The premises of their work are two central elements already found in the other works reviewed heretofore, and namely that a) design is an ongoing process and b) it is deeply interrelated with use. What is worth to me here, is the reasoning on the label 'design-in-use', which the authors began to deploy

> "*to capture practices of interpretation, appropriation, assembly, tailoring and further development of computer support in what is normally regarded as use.* [Hence, N/A] '*design in use' becomes a powerful concept, which highlights the incompleteness of any technical artefact, even the most skilfully designed one, and the need for its continual adaptation and further development. 'Design in use' emphasizes the creativity that lies in the embedding and use over time of the technical artefacts*" (p. 10).

The idea that rises from both this quotation and the two case studies presented by the authors is that design-in-use kind of covers the hole left open by older reasoning on design by accounting for all those tinkering, workarounds and misuses that are inherent to systems at work.

In both cases emergent modifications came into the system at different times. Through ICT[10] mediated co-development on the one hand and the embedding of users' feedbacks on the other. Thus, not only changes got acknowledged, but they also turned to leave a sign in systems structure.

Reading all those contributions in light of my research questions, I have to say that they leave a fundamental question unanswered: what about adaptations that do not enter the code? How to call them? How to account for them? Are they part of design-in-use? And if the answer is positive, how? I argue, all those questions did not find a definite answer in the reviewed papers; explicitly about the latter, Dittrich and colleagues talk about a 'meta-level' in which users have been let free to choose "*what applications to buy and make use of*" (p. 6). In my understanding, that is the only reported activity that has not to deal with coding. Yet, it is not enough to clear the argument. Aside from the centrality I give to it in my research, I think that a broader reflection on what we should account for in terms of design is fundamental. However, how much the boundaries of this concept can be stretched, remains yet unresolved. What I think, it is that it would be a too long step to consider technology enactments as 'design', although they contribute to shape software's evolution. Anyway, as I will have the opportunity to explain further on this work, I do not consider maintenance as a mere matter of design.

1.4. RESOURCES FOR A SOCIOLOGICAL ACCOUNT

In this section (Ch. 1.1 to 1.3) I stepped from the technical perspective who sees post-implementation as a set of punctual tasks to be carried out by computer technicians to the managerial perspective of organisation-technology alignment on paper; I finally came to design-in-use approach to systems' design, which embeds social aspects into an ongoing process of development. Interestingly to me, the term 'maintenance' is deployed just in the Computer Science approach, whilst elsewhere the point is rather addressed in terms of alignment and design-in-use. However, I tried to individuate a path that started from drawing the boundaries of the phenomenon to progressively shape the forms of what I conceive as an ongoing and integrated process of co-development. Nonetheless, the frame still remains fragmented; in chapter three I will sort things out and restructure them together into a consistent theorisation.

[10] Information and Communication Technology.

By now, the point is to move away from the prescriptive perspective of information systems-related phenomena to join the domain of practical accounts of technology at work. Indeed, as Tzoukas pointed out (2009), information system can be either seen as a managerial task or a phenomenon in the context of professional practices. As I had the opportunity to show heretofore, the literature who directly assumes such a point of view to analyse maintenance-related topic is almost absent (Avison & Al., 2004). Therefore, the attention must shift to other contributions which diversely addressed the point (or at least some of its constitutive conceptual and practical stances) to complete an informed theoretical frame.

The experiences I am going to look at here are mainly three: on the one hand there are the ethnomethodological accounts of workplace activities and their idea of situated action; secondarily the concept of care carried out by Ciborra's (1992; 1997; 2004); finally, I will discuss the Science and Technology Studies contributions about the concept of technology's enactment. All the three represent a kind of missing plugs to be 'engrafted' in a sociological account of the research object, and therefore I considered them as 'resources' for my work.

True, this solution is not an original attempt. Indeed, from the fall seventies, Information Systems studies tried to move away from the economical approaches to integrate (or substitute them with) contributions from other disciplines (Johnston, 2001). The point at stake was the unsuitability of traditional managerial accounts in understanding the phenomenon of technology's use. From here, the recourse to sociological theories. According to the author, what came up to be central is the notion of situated action, which got progressively embedded in information system studies' '*toolkit*' (Johnston, 2001; p.240).

The concept of situated action is the central point of ethnomethodological accounts of *Workplaces Studies* (WPS) (Health & Al., 1995). From this stream of literature I want thus to borrow two central aspects: first of all just the situated action's concept – with specific reference to technological relations – as alternative to rational theories of planned action; secondarily, but inherently tied to the first, the recovering of workplace interactions' analysis.

The application of situated action concept to technological phenomena is mainly due to Suchman's work, in particular her already classic work *Plans and situated action* (1987). From the very introduction, the author clearly defines the perspective's turn by stating that crucial social processes are interactive and circumstantial, located in the relation among situation-enrooted actors. Assuming plans and models as self-standing and self-concluded elements does not help to understand how courses of action are determined, and therefore they are useless to reconstruct the logics of doing, unless they are not accounted as elements invoked by actors in the course of their

activities. As Orr clearly pointed out in his outstanding work on photocopy machines' maintenance, work "*is resistant to rationalisation, since the expertise vital to such contingent and extemporaneous practice cannot be easily codified*" (Orr, 1996; p.2). Anyway, as Suchman herself clarified (2003), 'Situated' does not mean 'without plans'. On the contrary, it is the activity of planning in itself that is a reflexive process which set the basis for its realisation. Hence, the point in Plans-Actions' relation can be declined as "*the relation between the activity of planning and the conduct of actions-according-to-plan*" (Suchman, 2003; p.301). With reference to technological artefacts, Suchman observes that human-machine communication is actually an outcome of both the resources embedded in the object and (most of all) the affordances of machine-at-work (Suchman, 1987). What derives from this is that "*we can only understand technologies, and the various formalisms which may be involved, by considering how they feature within practical action and with regard to circumstances in which mundane activities are produced"* (Health & Al., 1995, p. 303). The ethnomethodological approach has thus the merit to shift the analytical focus on the practical accomplishment of action within workplaces and on the ways through which participants themselves constitute the meaning of doing by practicing technology. Consequently, the latter is not a steady element but rather a technology-in-action.

More generally, Workplace Studies brought back into the sociological debate the study of the work in itself, which for a long time disappeared from the interests' horizon of both organisational studies and sociology of professions (Bruni & Gherardi, 2007; Llewellyn & Hinmarsh, 2009). From the contributions I reviewed in this section, I can say that this critique can be casted up at Information Systems Studies, too.

Outstanding examples of such a situated approach to technology could be found in both the analysis of an airport operation room held by Suchman and colleagues (1999) and, perhaps most central to maintenance topic, Orr's work on Xerox photocopy maintainers' activities. Both contributions shown that work is anything but a cognitive accomplishment of tasks; on the contrary, it is an inherently social phenomenon arising within the complex interaction of people, groups, knowledges and technology that can be understood through the analysis of its concrete and situated unfolding.

An other outstanding aspect of human-technology relation has been declined by Claudio Ciborra in terms of *care*. With such a concept, the author reverses the traditional managerial perspective of strategic alignment upside down, by looking at technology's implementation as a constellation of unexpected emergencies which imply frequent adaptations, when not even a reinvention of the original system (Ciborra, 1997). The author remarks the gap between what it calls *alignment on*

paper and *alignment in action*. In the latter, a fundamental role is played by how actors in the workplaces take care of the system that they are using. He defined the concept of care – in a phenomenological declination – as "*just familiarity, intimacy and continuous commitment* […] *linked to how we are in the everyday world*" (Ciborra, 1997; p.73). Such a process finds its roots in the daily problem solving-based learning, until technology becomes so familiar that it exits the horizon of alert. In contrast with the idea of alignment as a strategy's outcome, the concept of care introduce a perspective in which it is rather a "*a continuous aim of supporting and developing alignment as a relation which involves various actors beyond management* " (Simonsen, 1999; p.79). Deriving from this, Ciborra drawn the attention on situatedness from the design phase, already extensively documented, to the domain of technology's implementation. In doing so, he implicitly acknowledged the importance of care in the evolutionary process of computer enhancement. More specifically, the worth relies upon the valuable contribution of analyzing the technological applications, along with the already practiced informal uses and casual tinkering (Ciborra, 1992). Indeed, the main aspect of care is that is continuously performed by actors, a recursive and reiterate activity which acquires meaning just in its being-there in specific moments.

Such a perspective acknowledges the relationality of alignment, denying the steady nature of both technology and planning. Moreover, it puts the actors at the centre of the stage, taking into account each and every group involved. After the review of several managerial accounts, the very point of considering users as actors proved to be a valuable change of perspective. In relation to the traditional accounts, I might say Ciborra brought into the discourse what I can reasonably call, paraphrasing Latour (1992), the (human) missing masses.

The idea of maintenance as a situated process implies that it is in continuous relation with technologies' situated uses. Through a large extent, as I will explain further on in chapter 3, maintenance concept largely overlaps technology-in-use.

In the recent literature both technology-in-use (Orlikowski, 2000) and technology-in-practice (Suchman & Al., 1999) labels are used more or less as synonyms (Bruni & Gherardi, 2007). I do not want here to enter the debate, but rather to individuate the theoretical contributions they granted to technology studies, and specifically to the field of Information and Communication Technologies (ICTs). Further on in this work, I will assume a critical reasoning which overcomes the perspective I am going to review here (see Ch. 3.2.2). Nonetheless, the aim now is to look at the valuable insertions that such a perspective brings into the argument about maintenance I am carrying forward.

Technology-in-use's concept comes from Orlikowski's article "*Using technology and constituting structures: a practice lens for studying technology in organizations*" (2000). This work moves from a former theorisation of the same author in which she applied Giddens' structuration theory to technological phenomena (Orlikowski, 1994). The turning point is the fact that most of constructivists and structurationists approaches postulate (more or less explicitly) that the social construction of technology concerns the design phase, whilst they kind of shift into determinism about the implementation (Woolgar & Grint, 1991). Once again, this statement is challenged by the evidence that people modify technology far beyond the design phase (e.g. Ciborra & Lanzara, 1991).

Orlikowski overcomes this *empasse* by abandoning the concept of technology's appropriation and introducing the idea of *enactment*. The turn relies upon the awareness that technological properties are anything but merely encrypted but they are rather emergent. With the concept of enactment "*rather than starting with the technology and examining how actors appropriate its embodied structures, this view starts with human action and examines how it enacts emergent structures through recurrent interaction with the technology at hand*" (Orlikowski, 2000; p.407).

Thus, not only users choose whether or not to use technology, but, in doing so, they choose which properties to use, how to interact with them, no matter what the idea of designers might have been. From here, structures are not external and independent from human agency, an out-of-there element ready to be caught and appropriated; on the contrary, they emerge from the reiterate human-technology interaction. The author calls such enacted structures '*technology-in-practice*', to distinguish them from technology as an artefact. Deriving from this, the attention has to focus on those practices who enact specific technological properties so that they end up to shape both technology's use and meaning.

According to the author, the implications of enactment's concept are threefold:

1. first of all, it is not a cognitive but a social phenomena. It is social to a double extents: on the one hand, because in the enactment of technology-in-practice also other social structures, norms and interpretative schemes are enacted; secondarily because such enactment shows up to follow common patterns within communities who share common workpractices. That is due to the fact that enactments are influenced by shared training experiences, work socialisation, comparable work experiences, reciprocal coordination and shared narratives.
2. it is a processual, recursive and reiterate phenomenon, and therefore technology could not be accounted as a black-boxed element. Users may either reinforce specific structure through their

reiterate enactment over time, or they might transform it – the very process through which change happens. Hence, stabilisation is always provisional.

3. finally, technology can not simply be seen as a closed choice among the set of properties embedded during the design phase. That does not mean use is totally malleable, neither. Indeed, tool's physical limits should not be denied, but it either seems that the more technology gets integrated in large systems, the more constricted the range of potential uses becomes.

To me, the concept of enactment represents a key feature for the understanding of maintenance, for it suggests to look at the practices which constitutes technological phenomena. Such practices are accounted either in terms of situated ways of technology's enactments (practices of use), and as recursive and reiterate processes.

In this chapter I thus tried to look at sociological disciplines to widen the perspective emerged from the former review. I agree with Johnston as he pointed out (2001) that the 'traditional' frame of accountability looked stiff and incomplete, without taking into account how maintenance develops in practice. Concepts such 'situated action', 'care' and 'enactment', rising from communicating but separated streams of enquiry, they all represented an encouragement toward a social analysis of maintenance-related dynamics in those workplaces in which technology is implemented. They represent a kind of showcase to develop my own frame. Before that, I have nonetheless to explore the other theoretical topic of the research, and namely how, when, and why people get involved and participate in information systems' development.

2. USERS, PARTICIPATION AND THE INFORMATION SYSTEMS

Owed to the theoretical contributions I reviewed in the last chapter, situated enactments and practitioners' contribution to systems-related phenomena seem to be undisputable elements for the study of Information and Communication Technologies at work. In this section I will hence go through an extensive body of literature which aimed at framing, classifying and understanding users' role in systems' development. Although Participatory Design is not the only stream I will take into account, it is nonetheless true that it developed the more articulated and in-depth reasoning on this topic. Therefore, the upcoming review will considerably refer to the contributions of this community of studies.

2.1. DIFFERENT CLASSIFICATIONS OF USERS

The debate around who participates (or is supposed to) to the process of information systems development and implementation is anything but recent. On the contrary, one may say it has been a central concern from the very first experiences of collaborative systems design attempts, namely the Scandinavian work-oriented approach of the middle seventies (see Ehn, 1992, Beck, 2002).

Anyway, in the analytical definition of who the user is, several classification cumulated over time. I will review here the most popular ones, beginning from the Ives and Olson's (1984), which seems to me to have a wider scope. Those authors distinguished among a) Policy makers; b) Key-stakeholders and c) Users and their representatives.

This classification is deployed within the broader reasoning upon forms of actors involvement in the process of development and decision-making where a computer-based system is implemented. Authors reviewed the existing literature in search of hints for the enhancement of further systems developments. From this point of view, during the last twenty years, the topic has been extensively debated so that this contribution is at least taken for granted, where not out-of-date. It is useful to recall these findings here, as I challenge the concept of participation within information systems management community by pointing out a more extensive perspective of actors involvement which goes far beyond the traditional management-analysts pair (which, at that time, represented an outstanding attempt).

An other remarkable classification has been proposed by Eason in his 1987 article in which he discussed the role of ICTs in the process of organisational change. He focused on users, and identified three classes: a) Primary users, who often relate with the system; b) Secondary users: occasional users or people who use the system with the mediation of someone else; c) Tertiary users, who undergo the consequences of the system and therefore entitled to the right of shaping information systems contents.

To me, this subdivision is somehow problematic, mainly because the first two classes are based on the frequency of system usage, whilst the third on activity and passivity. Nonetheless, it looks interesting to me for it moves from a cross-sectional reading of participants, released from their professional role and 'observed' through the point of view of either the relation they entertain with technological devices and the effects technology has on them. To me, that enriches the perspective and avoids the constraints of reading the human-machine relation under the univocal light of hierarchical stratification.

As underlined in the most recent reviews (I will here mostly refer to Karenborg e Stahlbrost, 2008), the contemporary definitions of users moves way from this first two due to a couple of reasons: first of all they awaited the influence of other disciplines like Innovation Management (Von Hippel, 1986, 2001) who contribute to shape the perspective on users; secondarily, they consistently rely upon concrete development experiences, and therefore they mainly focus on end-users.

About the first point, Ousdhoorn e Pinch remarked the progressive crossbreeding of categories, enforced by user-consumer ontological equivalence (2007). However, if the users deploys something for utility purposes, the consumer pays for it, and therefore establishes a totally different relation with the object. That is noticeable from the very definition Von Hippel (1986) gave of:

a) Lead-users, who will benefit (in the future) from a certain product and for this reasons are highly committed in contending their requirements. Here the role they play is proactive and led by legitimate profit;
b) End-users, who will practically deal with the product;
c) Users representatives, those who speak on users' behalf and claim for their needs;
d) Early adopters: people who test the product. They do not represent the typical consumer but they use the system before others to gain some kind of competitive advantage;

According to Karenborg e Stahlbrost (*ibidem*) this definition gained citizenship within information systems studies more than the others. In any case and despite the interbreeding, concrete experiences dealt almost exclusively with end-users profile. Developing their argument,

the authors then put on stage two sub-definitions of 'what' end-users might be, moving somehow outside the boundaries of Von Hippel's classes, though. More in specific, they distinguish users according to the role they play with reference to data: there are thus people who provide data contents and those who use it. This first division appears to place lead users in end-users category, too. On the contrary, the second classification sorts out two different design situations: whereas design is marked on specific groups, there the involved people will use the system for sure: these are called *actual users* by the authors. Otherwise, and namely in case of more generic information systems for whom it is not easy to identify a clear typology of users, not-better specified *potential users* will gain a role. In view of those declinations, potential users might easily encompass all the four Von Hippel's categories of users, so that the classification remains somehow uncertain. Moreover, Karenborg and Stahlbrost do not univocally distinguish between individual users and groups, and indeed they are almost interchangeable in the text. Then the question to be asked is to which extent end-users could be unambiguously separated by their representatives. The authors address it by quoting Munford (1979), who argued that the principle has to be found in the actual commitment toward representation, and how open developers want it to be. That of course solve the matter at an analytical level, but I find it leaves some practical details unsolved. For instance, it does not work in case users representatives are end-users, as well.

Despite the limits they might have, all these classifications have the merit to account for users, who have been otherwise largely forgotten actors . At this point, it is worth to question what could be the added-value of the comments I fostered with respect to maintenance. It is true that none of the articles addresses explicitly the topic, so that what I can reasonably do is to draw some general remarks. First of all, it seems clear that the more narrow your focus becomes, the less accurate the classification becomes. Indeed, Ives and Olson (1984), remain on a general level and they draw a comprehensive account without leaving anyone out. Diversely, all the other definitions shape the scale and zoom the scope; in doing so, they paradoxically miss the complexity of people while they interact, and they consequently end up focusing on end-users only. This is too far from the vision of users as 'who uses the system' that I want to carry on in this work. More specifically, it is in my opinion much worthier to continuously question whether our account chases someone off from the horizon. This is the case, in the reviewed literature, for the people who build the system.

2.2. NOT ONLY END-USERS

For clarity purposes, one can say that two different perspectives emerged in the reviewed works: a top-down vision which focuses on managerial stances, and the opposite, bottom-up point of view, which emphasizes end-users needs and workplaces dynamics. Such a dichotomy leaves technicians on the background, although they play a central role in systems maintenance. It is not useful to go back to the Computer Science prescriptive envision of technicians work, but it is better to fully exploit the definition of users as 'everyone who uses the system'. Like end-users, programmers use the system as well. The difference is just that for users the system is a work-supporting tool, whilst for programmers it represents the very object of their job (Star, 1999). Obviously, I am not saying that traditional approaches leave programmers out, considered that computer professionals are central in the development process (e.g. Avison & Fitzgerald, 2000). Yet, they are not explicitly taken into account. They are simply taken for granted, along with their activity. For this reason, it is convenient to take a look inside the 'technicians big family' and distinguish among analysts, designers, and programmers. Analysts and designers are generally part of the development steering group, whilst programmers are those whose contribution is often forgotten, despite the fact they write the code and 'give life' to the system.

An interesting insight on such a topic is given by David Read (2003), who compares traditional methodologies with *extreme programming*. The central point can be resumed in the following quotation:

> "*It is not to much of a stretch to conclude that one of the reasons extreme programming have become so popular is that it recognize (explicitly or implicitly) that programmers have a critical role to play in software design, even when they are not given the responsibility to create or alter the design*" (Read, 2003; p.3)

Now, if the term 'programmer' was substituted by 'users', it would be likely the case of one of the several claims for users involvement in system development. As end-users have been largely left aside from the mainstream accounts and passively forced to undergo decisions, Read draws programmers' position all the same.

Hence, what is worth to me in this article is just the acknowledgment that, in a large part of literature, technicians are simply taken for granted. Read shows us the limits of such a superficial reading, stressing the added-value of enhancing programmers' work . Although author's account

refers to extreme programming, the expressed concept overcomes the boundaries of such methodology (I argue is there that the issue becomes particularly noticeable), and can be potentially generalized to every development process.

With reference to maintenance, not to take programmers work for granted contributes to open up the horizon of the enquiry, following the aim at an inclusive and opened approach to systems implementation.

2.3. FORMS AND MODELS OF PARTICIPATION

As I had the opportunity to argue here above, with time a 'users-oriented' (or informed) analysis progressively gained centrality in information systems literature. However, I do not believe I'm mystifying when I affirm that most of the related works did not focus on the user in itself, rather that they looked at it with specific reference to the forms of involvement actually or potentially put in action during the design phase.

From this point of view, the abundant literature cumulated over the years and the numerous empirical experiences both contributed to the rise of diverse scales which analytically synthesize the degree of users' participation (Karenborg & Stahlbrost, 2008[11]). Among the others I can here recall Ives & Olson's (1984), Munford's (1983), Macaulay's (1995) and Olsson's (2004). In any case, as Karenborg and Stahlbrost (2008) pointed out, in time a threefold classification reached a progressive agreement within Information Systems Studies community. Such stratification embeds different disciplines' contributions (once again, mainly Innovation Management), and it is founded on the characteristics of the participatory design process. Indeed, design could be conducted:

For users: both product and services are developed on behalf of users, trying to address their needs through data gathering (interviews, focus groups, and so on). Such method is generally based on simulations and theories which foreshadow a potential use of the system. Users are here thus taken in consideration but they do not play an active role in systems building; analysts are those who lead the way (Kanstrup & Christiansen, 2006), whilst users might be asked to ratify decisions, whenever and if scheduled. Thus, their role is inherently communicative instead of applicative. Design and development still remains a 'technician affair' and their ability to both catch workpractices and translate them into the system.

[11] The Author's review specifically addresses Participatory Design experiences.

With users: in this case designers and users cooperate in a co-development process. The firsts ones still maintain a substantial role of control, being them responsible for both the cooperative group work coordination and methodology management. Yet, they act as technological advisors, warning users about technical affordances and informing them to make their decisions robust and reasoned (Eason, 1995). Users, on their side, acquire more power of system's forms and contents negotiation. Hence, if the autonomy of design is still demanded to programmers and analysts, users are now charged of contents shaping and evaluation.

By users: such an approach expects users to develop the product with programmers support and services. Users are hence the innovators, here, whilst the latter are facilitators who have to harmonize users efforts and support their creativeness. As Kanstrup and Christiansen (2006) noticed however, such a solution is almost never used in IS design, whilst it is much more popular in product development. It is much easier that it is deployed to develop just small parts of the system, in the more general context of a different methodology. If it is the case, users design parts of the artefact which then programmers insert into the final system.

This threefold classification seems to me particularly interesting for two main reasons: first of all because it represents a shared solution over time (we find it, for instance, in Ciborra & al. (1982), Barki & Hartwick (1989), Eason (1995) and in the already cited articles from Kanstrup & Christiansen (2006) and Karenborg & Stahlbrost (2008)); secondarily because it puts users in relations with programmers. I mean, 'finally' participation shapes around these two categories interrelations. Nonetheless, and that is the main criticism that can be abducted, such an outcome becomes visible just after an *ex post* evaluation, deriving from the embedded structures of the system. However, if one accepts the idea of systems as provisional stabilisations – for they undergo continuous re-negotiations in practice – , the principle of participation evaluation seems to me to be potentially questionable. Indeed, participation itself – like the system – cannot be considered as something given, stable and black-boxed once and for all, but it is rather emergent from dynamic processes. In my understanding, this idea sustains design-in-use concept (Dittrich & Al., 2002), where it suggests not to rest on satisfactory statements but to look at the implications of participation in the ongoing coordination among systems use, adaptation and development needs.

2.4. RISKS OF PARTICIPATION

Presenting the most valuable developing solutions which overtook System Development Life Cycle (SDLC), Avison & Fitzgerald argued that, despite much progress in the tackling of waterfall models weaknesses, "*there is no panacea: no one(sure that this is correct? I'd have said 'no approach') approach solves all the problems*" (Avison e Fitzgerald. 2000; p.37).

The same warning has been claimed, within Participatory Design community, by Greenbaum (1993), who apprised participation could not possibly be an universal treatment against systems failure. More in specific, the author laid bare the potential threads of an extreme application of participation (namely extreme computing), in which the whole system is defined by users ignoring both all the other organisational stances and the technical requirements. Greenbaum concludes that such a solution can easily lead to fragmented systems which, just because they are eager to address different needs, end up having the same functional limits of interoperability spotlighted by traditional methodologies.

More or less on the same line is the critique held by Riedl et al. (1998) with reference to e-commerce software solutions. Reviewing different attempts of identifying recommended systems, they highlight the risks of an extreme customisation, showing the technical limitations of a too narrow implementation.

Beyond the technicalities, however, both articles suggest to not only consider the added-value of participation enhancement, but also the threads underneath an extreme application of customisation.

With regard to this topic, I found Howcroft and Wilson's (2003) metaphor particularly enlightening. They propose to see programmers (people carried of concrete users involvement) as the roman two-faces god Ianus. Indeed they have to navigate their way through users-management organisational antithesis. Participation may be the way out of this, but it more often reveals to be just a rhetoric device, when not a way to reproduce existing power relations. Participation could actually act as a way to exclude discord under the cover of empowerment, involvement, agreement.

Another issue at stake is when and under which conditions to accept participation . As a matter of fact, it does not seem to be applicable always and whenever, but it rather substantially relies upon practitioners' commitment towards being involved, that is to say whenever they convey a 'sufficient' degree of activism. As Karenborg and Stahlbrost (2008) underlined, participation succeeds just in case of a continuous stream of ideas combined with participants activism. If this is not the case, workers can also neglect involvement , generating resistances in technology's

implementation and use. Such a situation is extensively documented in literature, but I think it could be effectively resumed by Correia and Yussop's (2008) recent article's title: "*I don't want to be empowered"*. Even further, Barki and Hartwick (1989) argued one should distinguish between involvement and participation; only in the latter case users volunteer and proactive commitment founds citizenship.

A final element to debate is whether and in which cases participation is important. I am not referring here to the supposed functional effectiveness of participatory solutions as opposed to traditional methodologies, but more specifically to users' contributions in the development process. The value added of it shines wherever participation is informed, well-aware and based upon specific abilities and skills. It depends on what Ehn (1992) defined as *skill-based participatory design*, in opposition to the attempts of implementing participation 'come hell or high water'; if participation does not bring into the system the inherent specificities of the work, enhancing participation is not worth the effort.

The contributions reviewed in this section can thus be summarized into four main conceptual stances:

- Defining who the user is largely dependent on the scope of the analysis. What emerges from literature is a set of overlapping classifications, most of them focused on end-users;
- Participatory process dynamics are read in light of users-designers conflict, no matter if the latter are managers, programmers or analysts. Read's (2003) piece suggests to overcome such reductionist approach and focus on the different contributions the involved people might bring into the design;
- Participation is not a monolithic element to be implemented. On the contrary, its declination follows specific paths according to the contexts;

However, participation is not *the* solution. It is not worth always and whenever. On the contrary, , it could be even a threat if it is forcedly applied

3. MAINTENANCE-IN-USE: ASSEMBLING THINGS IN PRACTICE

In the first two chapters the reader had the possibility to explore the complexity and multiplicity of maintenance as I have declined it. Scarcely addressed, such issue revealed to have connections with several works coming from diverse communities of studies: from Information System Management to Computer Science, from Science and Technology Studies to Organisational Studies, from Participatory Design to the Social Studies of Information and Communication Technologies. Far from being an obstacle, all those different perspective contributed to take into account the diverse aspects of the research object.

In this chapter I thus want to close in on such complexity, bringing maintenance back into a more sociological theoretical frame, whose focus lies in the information systems' situated account and in how participation concretizes through the activism of different professionals.

Such a declination of maintenance represents – at least partially – an original perspective, emerging from the 'artful integration' (Suchman, 1994) of different theoretical fragments. The attempt to bring them together into a consistent singularity calls for a re-definition of largely used terms in literature, such as 'maintenance', 'user' and 'participation'. I review them here so as to integrate them into a personal theoretical re-elaboration.

The argumentation will hence develop in a pseudo-incremental fashion: I will first reconstruct maintenance in light of the literature review, tying fragments together into a provisional definition of a situated and ongoing phenomenon based on technology enactment. Using systems will then become the source of agency and change.

I will then evaluate the phenomenon under the light of sociomaterial assemblages enacted within interactive practices. From the preliminary definition of maintenance-in-use I will hence pass through the reasoning on assemblages and a reflection on the fruitful implications of assuming a practice lens to take it into account. I will then define all the multiple environments in which systems are distributed as 'ecologies of practices' (Gherardi, 2009), in which some of them act as mediator of maintenance. Participation will be then presented as a core element in such a context, unleashed from super imposed categorisations but rather emergent from the interactions on the field.

3.1. MAINTENANCE-IN-USE: WHAT DOES IT MEAN?

Information systems' maintenance is hence a multi-dimensional phenomenon which embraces diverse aspect of organizing, technology and work. This first paragraph wants to draw the boundaries of the phenomenon under scrutiny, and to suggest a brand-new definition. To define the object is indeed the first fundamental step to develop my theoretical argument on what I will soon label as 'maintenance-in-use'.

But let me go back first to the literature for a moment, in order to set the premises for a sociological analysis of the research object. As discussed, the term 'maintenance' is mainly found in the Computer Science literature, where it refers to the set of operations and tasks directed towards keeping systems operational. We will thus have different interventions according to the 'problem' they are set up to face (Swanson, 1976). Those technical operations could be subdivided into two groups: the first one is what the author calls 'preservative', which encompasses bugs fixing and what is more generally known as technical support; the second one is, on the contrary, 'evolutionary' and concerns systems' change depending on both internal or external organisational demands. Elsewhere, these second group is called 'enhancement', introducing the concepts on ordinary and extraordinary maintenance (Bratteteig & Al., 1991). To this extent, maintenance draws back to specific activities which are concluded in space and time and set up on demand to fix or improve the system (or some parts of it) . These interventions hence represent just punctual and clearly identifiable moments in the system's life cycle which create a rift in the so-called post-implementation phase (Avison & Fitzgerald, 2000).

Another key point emerging from this literature is that maintenance remains a 'matter of technicians', and it seems to be always and in any case a matter of code-writing. Anyway, this is perhaps the most common meaning of maintenance: a set of interventions delegated to skilled professional personnel.

Now, the question is whether this set of technical operations is (both practically and theoretically) enough to keep an artefact like an information system alive. In his worldwide-known book "*Zen and the art of motorcycle maintenance*" (1974), Pirsig offers a rather different vision of maintenance, pointing out two different ways to preserve vehicle's functionalities: on the one hand, it could be actually delegated, in case of breakdowns, to a garage mechanic, so to say to the depositary of a specific, technical and - let's say - 'esoteric' knowledge, who deploys what he/she knows to variously fix brake shoes, substitute exhausts parts, tire changing or whatsoever. To me,

that has strictly to deal with *repairing* an object. Otherwise, the object can be kept in good conditions through some reiterate activities (see the literal meaning of maintenance in Chapter 1) not directly connected to specific technical skills but rather to the intimate acquaintance of the vehicle (e.g. listening to the engine, choosing among different types of fuel, regulating air-fuel mixture, keeping revs on, and so on). Such a process is daily accomplished by the informed practitioner, namely the one that has technology at hand (Orlikowski, 2000).

Coming back to information systems domain, I found the assumption of an intervention-based approach reductive, if not misleading, for two main (good) reasons: first of all, to focus on technicalities leads to leave out both contexts' specificity – as if those interventions are ethereal and applicable always and whenever –, and the contribution of all those people who deal with the artefact in their daily life. Secondly, to pose the attention exclusively on pinches (e.g. the critical happenings) tells almost nothing about what caused that situation, which consequences it might have and which dynamics were happening before and after that.

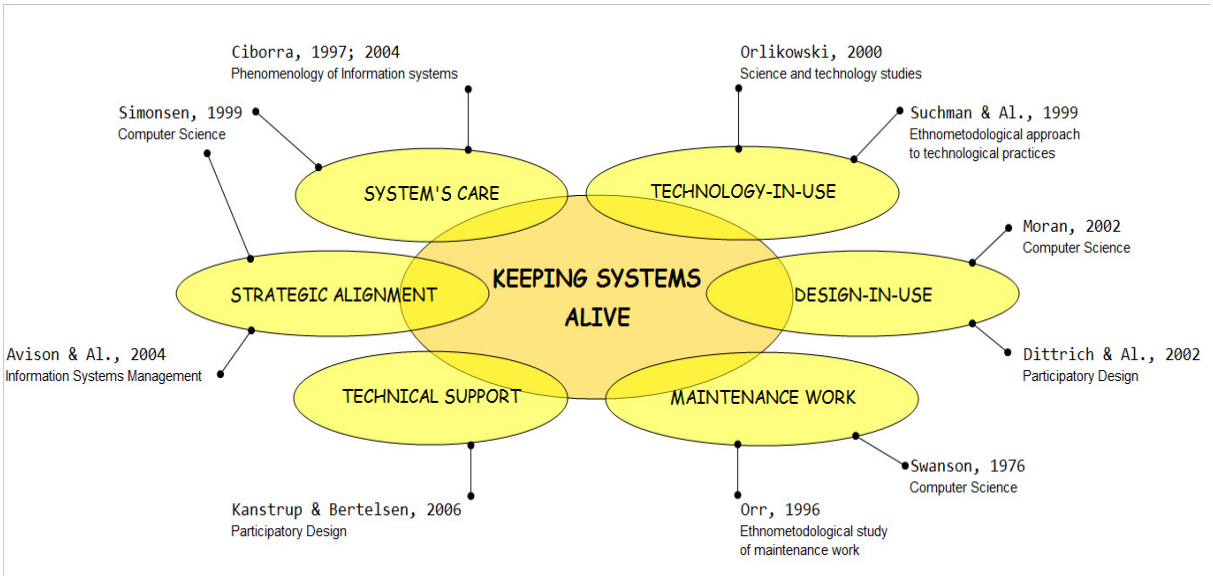
To aim at understanding these such aspects of maintaining casts the researcher in a much deeper, complex and articulated dimension of maintenance. In order to approach this complexity, the researcher can benefit from the contribution of multiple perspectives. Indeed, as I had the occasion to debate in the first chapter, the more the reader moved from the traditional Computer Science approach to the sociological accounts, the more elements came into stage, adding relevant cues to take into account different aspects of the phenomenon. Deriving from the former chapters, to maintain could:

a) Be part of an open-ended process of participatory evolution of information systems (e.g. Mason, 2002; Fischer & Al., 2002; Dittrich & Al., 2002);
b) Mean to take care and daily re-invent systems on the basis of users' performances (Ciborra, 1997; 2004; Simonsen, 1999);
c) Be the moment in which technologies are enacted in practice; through the study of these enactments the researcher can reach a deeper understanding of both technology-in-use (Orlikowski, 2000) and technological practices (Suchman & Al., 1999);
d) Be a *locus* of interaction among users, technicians and technology, in which the dynamics of maintenance work become visible (Orr, 1996);
e) Be a space for the accomplishment of specific strategies of alignment between organisations, technologies and external changes (Avison & Al., 2004)

All these elements are drawn together in the picture here below: in the middle I position the maintenance-related area of interest, intersected by six bubbles. I Labelled each of them with the

terminology used in the different streams of literature which addressed (not explicitly, however) the diverse aspects of keeping systems alive. Tied to the bubbles, the authors and the communities of study to which each of them belong.

Picture 2: Different dimensions of keeping systems alive[12]



This assemblage I propose here, far from representing an exhaustive review (see Chapter 1), does not ignore both the epistemological differences and their ontological standpoints. On the contrary, to draw things together served the aim at highlighting some fundamental elements which contribute to the definition of maintenance as I intend it; Indeed:

- It is not understandable merely in term of systems life cycle's phases, being it rather a process;
- It is based on the alignment between different elements of organizing, technologies and work;
- It involves different professionals along with heterogeneous material (and semiotic) elements;
- It cannot be possibly understood disregarding the context(s) in which it takes place.

To take these characteristics together will then help me to study how maintenance unfolds in daily working life, a process which encompasses several heterogeneous actors, practices, objects, artefacts and activities. In order to account for such a phenomenon, I argue that it is necessary to label it in a way which immediately pushes it away from the reviewed terminology. Since I state this process to be enrooted in systems use, I will then call it hereafter 'maintenance-in-use' (MIU).

[12] Cited contributions are just a small part of the body of studies around the topic. They nonetheless are the ones that seemed more central to my argument, and therefore enter the picture. Methodologically, also the intersections among the different streams should have been graphically visible. Unfortunately it has not been possible, not meaning I disregard the connections among the different works.

This term draws back to the study of science and indicates the intrinsic relation between maintenance and the situated enactments of the technology to be maintained.

However, before going forward with my argument, I want to make explicit the relation between maintenance-in-use and the concept of alignment. Indeed, I embraced the idea that maintenance is actually based on some kinds of alignment among technology, organizing and work. Looking at literature, one of the most relevant criticism is that alignment is seen as a goal to be reached. I want to definitely move away from this conceptualisation and question the idea that maintenance is a product of alignment. On the contrary, alignment itself seems to me a process of assembling things together to reach an equilibrium, which nonetheless is always provisional and imperfect. As Prentice (2005) noticed, alignment is not immanent to human-machine boundaries, but rather an effect of lived combinations of people and objects. Therefore, it would be the case of different 'degrees of alignment' within the same realities. Far from being negative for the study of maintenance, it is rather fundamental to acknowledge that a system is kept alive *no matter if things are perfectly matching*, since I argue that different degrees of alignment individuates different ways to keep systems working within workplace realities. Hence, the attempt of keeping things aligned is what contributes the most in drawing the borders of maintenance as an emergent outcome.

At this point, I can come up with a provisional definition of what I called maintenance-in-use, by defining it as

> *the resultant of the situated attempt of aligning technology, work and organisation, - toward which different professionals together with nonhumans elements concur - that aims at keeping systems working within organisational realities.*

I consciously used the term 'working' instead of 'functioning', just to resolutely connect maintenance to use. Indeed, it is not merely the case to keep systems operational, but better to analyze to which extent the system ends up to gain its space and role in organizing – so to say how the *workability* is preserved – and along which trajectories it moves.

Owed to the assumption of a phenomenon that is based upon the situated enactments of things at work, maintenance shows up to be an iterative space in which different technicalities 'get in trade'. In the next paragraphs I will more narrowly concentrate on this concept. Now, after the definition of the research object, the argument will trace the epistemological standpoints of this work. To do so, a discourse on practice and sociomaterial assemblages has to be developed.

3.2. LOOKING AT MAINTENANCE-IN-USE THROUGH A PRACTICE LENS

If we accept maintenance-in-use as a phenomenon emerging from the process of situated alignment of things, it is now necessary to look at how human and nonhuman actors (or better, the combination of the two) give life to this ongoing relational movement. In other words, I must propose an analysis based on the interactions among heterogeneous elements, and on how these interactions shape the phenomenon at stake.

Analyzing how things are kept together requires to look at how this process unfolds in practice. Indeed, it is there, in the context of practices, that the phenomenon gets shaped. The practice lens (Corradi & Al, 2010) is then the epistemological tool on which this work is built. Therefore, to understand what will come afterwards, it is necessary to indulge on this concept and explain the implications of this assumption on my study .

3.2.1. Thinking about practice and its implications

The dimension of *praxis* represents a central element in the philosophical reflection, from ancient times till nowadays. In the sociological domain, praxis is of prime importance in those streams of study dealing with the situated dimension of social facts. Within the community of Organisational Studies, practice have only recently gained a central position, thanks to what has been called *the practice turn* (Schatzki & Al., 2001) . With time, this led to several contributions which could be positioned under the 'family-label' of Practice-based studies (PBS) (Corradi & Al., *ibidem*).

In broad terms,, those contributions have a double theoretical origin (at least in the European context[13]): on the one hand the Interactionist approaches (Mead, 1934; Goffman, 1959) and ethnometodology (Garfikel, 1967), on the other the Actor Network Theory , a conceptual framework coming from the Sociology of Science (Callon, 1986; Latour, 1987) which entered the Organisational Studies mainly through John Law's work (Law, 1991). Hence, the heritage of such disciplines leads to both the understanding and the conceptual definition of practice.

[13] As Johnston (2001) noticed, the North American production is much more informed by Gidden's Structuration theory (e.g. Orlikowski, 1992; De Sanctis & Poole, 1994)

First of all, the practice-based approach acknowledges the interaction as the founding principle of action, both at the individual and the social basis (Mead, 1934). Such interaction does not follow pre-determined paths, but emerges from the courses of action. Hence, the sociological interest has to focus on daily activities and routines, and the ways through which people carry on with the simplest and most trivial things in life (Garfinkel, 1967); these dynamics represent a premise for the understanding of both the interaction and the roots of social organisation. Thus, the aim is not at observing how the action gets rationalized *a posteriori*, but rather at understanding the sense making process while the action is unfolding, both rejecting the idea of a social order before the individual and focusing on what gets enacted to understand, explain and order social agency. In order to make it possible, it is necessary that the ordering practices can be recognized as such by practitioners themselves, so that everybody can understand what is going on (Fele, 2002). In other words, those practices have to be accountable: visible and explainable in the development of the action. Thus, the common understanding of the practices becomes a fundamental condition of agency. It is just through this process that the practices can be sustained and continuously reproduced over time within the social group.

Acknowledged that the possibility for the practice to be recognized passes through the (inter)action, that means that the practice has to be constantly *performed*, put into stage (Goffman, 1959), and attended by practitioners in a recognizable, negotiated and provisionally stabilized way.

Hence, the social organisation emerges from a thick texture of interactions, practices and daily activities. The meaning of action revealed just in the lived performance of the action itself, which it is not possibly understandable outside the context where it takes place. To this extent, agency is inherently anchored to the setting in which practices are reproduced, so to say agency is *situated* (Suchman, 1987)[14].

The impossibility to account *a priori* for the circumstances which determine the action positions practice-based approaches in opposition to the strategic analysis of agency. Indeed, even if the action is planned in advance, looking at the interactions shows off the deviations, improvisations and the contingent translation of strategy in daily life[15]. The problem of planning should be posed not in terms of configuring the action 'on the paper', but better observing the ways in which strategy is put into stage (Suchman, 2003).

[14] The analysis of situated action at work has recently re-flourished, especially in the context of *Workplace studies* (Blomberg & Al., 2005; Llewellyn & Hindmarsh, 2009).

[15] According to Johnston (2001), is just thanks to the concept of situated action that practice-based analysis earned citizenship in the Information Systems Studies community. What is worth is indeed the possibility to trace a line and move away from the managerial approaches – concerned with strategic planning – and the real-life integration of technology in the work places.

However, Practice-based Studies do not only refer to ethnometodology and Interactionism. On the contrary, they embed the heritage of Sociology of Science, and in particular of Actor Network Theory – or Sociology of Translation – (Callon, 1986; Latour, 1987; Law, 1991). The contribution of Science and Technology Studies (STS) kind of complete the ethnomethodological and Interactionist approaches by stating the centrality of materiality and relationality for the understanding of social phenomena[16].

In these scholars' opinion, agency can not be accounted for without considering it as dispersed and rising with the concurrency of both natural and artificial objects. As Law affirmed, "*what we call 'the social' is materially heterogeneous: discourses, bodies, texts, machines, architectures, all these elements are deployed in the social and its performance*" (Law, 1994: 2). Therefore, the organisation of the social cannot come into being without the contribution of nonhuman elements. Humans and nonhumans thus constitute a network of actors in reciprocal relation. The author use the label of 'relational materialism' to identify such a dynamic (Law, 1994), an expression that stresses the importance of the ways in which people and objects mutually constitute and act towards the stabilisation of social order. This symmetry introduces the inseparability of the material and the social, so that the practices have to be considered inherently sociomaterial and the technology deeply entangled in the social (Orlikowski, 2007; Orlikowski & Scott, 2008)

Consequently, the focus does not rest upon the consequences of action, considered as outputs of a universal rationality underneath social agency, but, as the ethnometodology, also this approach rather concentrate on the order-*ing*. From the universal to the local and the situated, the interest shifts to the ongoing processes of arranging and re-arranging the social order within the borders of specific settings, defined and delimited in space and time (Cooper & Law, 1995). Such processes thus come into being in practice, considered as a relatively stable and socially recognized way of ordering heterogeneous elements into a coherent set (Gherardi, 2006).

In the next paragraph I will then frame the connections between the diverse arrangements that constitute the social and the practice as the locus and the mean through which they shape action and change.

[16] The typical reference is the question posed by Latour (1992): *where are the missing masses?*

3.2.2. Sociomaterial assemblages in an ecology of practices

As seen, sociomaterial approaches deny the humanistic idea of a rational agency 'owned' by humans. Nor is it possible to simply transfer this agency to the material side of organizing. One should rather see objects as 'potential actors' (Barad, 2003). The implications of such a concept are twofold: on one hand, agency is dispersed among the elements which constitute the frame in which they are entangled, so that "*both the sources* [of agency N/A] *and its forms are varied and variably contributing to the emergence of a macro actor, both for what is done and what is not done* " (Gherardi & Nicolini, 2005); moreover, agency emerges from the relations *within* what Suchman called *sociomaterial assemblages* (2007), or arrangements of people and things repeatedly enacted over time and therefore more or less stabilized in practice. From this perspective, agency is not an intrinsic capacity of human actors, nor of nonhumans, but it is rather the effect of the practices that are multiply distributed in space and contingently enacted in time. Barad named it 'agential materialism', which means that realities are constructed out of specific 'apparatuses' of sociomaterial *intra-actions* (*ibidem*).

To understand agency it is thus necessary to 'explode' the relations that keep things assembled together, because assemblage itself is generative. Indeed, both agency and change emerge from the affordances allowed by the contingent combination of humans and things. In other words, the assemblages identify the possibility for action (Suchman, *ibidem*). In the specific case of information systems, the author re-defines agency in terms of human-and-the-machine, meaning that the understanding of the development of related phenomena is achieved from the encounter between people and the artefact (and, I argue, the other different things that enter the action).

Owed to that, there are at least three main implications in assuming this perspective: first of all the reconstruction of humans' role in shaping reality, to which people do not 'abdicate', in the sense that "*persons are those actants who configures material-semiotic networks*" (Suchman, 2007: 270). Yet, people are embedded in specific arrangements which limit the 'infinite' possibility that the humanistic view granted to them. At a second stance, since it is the assemblage to be generative, this approach suggests to centrally take into account the history of the arrangements (the intra-relations that led to stabilisation), and the possibility for action they individuate, namely the consequences of practicing (Gherardi, 2010); finally, since things are differently enacted, the

attention has to be posed on both the situated ways in which they are enacted and their flowing in and out different assemblages.

Indeed, realities[17] are constituted by multiple arrangements mobilized in practice. That means, in my understanding, that elements of different sorts are enacted differently in the context of different practices over space and time. For clarity purpose let me take the case of an hospital: it is populated by top clinicians, doctors, nurses, administrative personnel, patients, relatives, alongside a wide range of different material elements and technologies, from the simplest such as beds and panpipes to the most sophisticated like CAT scanners, operating room robots, and so on. The same hospital may have several distributed offices and clinics (first-aid emergency rooms, radiology, dispensary, etc.), and it could be either part of a larger network of hospitals. Analysing this structure from the point of view of functional internal divisions, one could individuate surgery, cardiology, cancer centre, etc, and maybe stress the hierarchical relations among them. On the opposite, focusing on the accomplishment of daily activities, the researcher can put him/herself in a doctor's shoes (for instance) and look at the different activities attended in the same day: medical examinations, surgeries, professional trainings, therapies planning, and no one knows how many other tasks. In doing so, he/she shifts from a practice to an other, which cannot possibly be conceived as separated at all, entering combinations of people and things arranged differently depending on the performed activity. The same person, object or event thus act in a meaningful way with respect to the practice in which it is mobilized. Paradigmatic in this sense is the case of arteriosclerosis described in Mol's book '*The body multiple*' (2002): the author 'followed' the disease through the different settings in which it appeared. From a place to an other it changed: to the patients, arteriosclerosis is pain and movement's hindrance, in the medical laboratory it turns to be a veins constriction, and so on.

Out of the example, organisations could be red either in terms of hierarchy and power or under the light of the different practices by which they are intersected (Gherardi, 2009). To this extent organisations could be accounted as *ecologies of practices* which interacts in the daily life. Actors, no matter if humans or material, singular of social groups, mobilize and get mobilized according to what and how they are practicing.

This ecological approach derives from an alternative application of ANT to organisational studies, which "*does not presuppose an epistemological primacy for any one point of view; the important question concerns the flow of objects through the network of participating allies and social worlds*" (Star & Griesemer, 1989: 389). Under this light, the ecological approach does not

[17] Which I decline at plural as Law suggested (2004)

focus on the power dynamics, neither on how specific actors end up to 'speak on behalf ' the others[18], but better on the interactions that come into being among mutually constituting actors and social worlds. Therefore, the interest should rest upon how they relate, emphasizing the role of dominant strategies as well as the subordinated ones, on how these latter contribute to shape social ordering along with their enrolled actors.

Hence, this perspective shifts the attention from the dynamics which constitute power to those of activity and passivity, positioning at the same level either humans and non humans actors, practices, artefacts, logics of action and programs. The attention is posed on whether they act or remain still and on how they do it. Moreover, the ecological approach looks at the concrete unfolding of action without neglecting the history of the arrangements that led to the specific configuration of the enacted assemblages. Whereas the entrepreneurial approach deals with institutionalisation and configuration, the ecological addresses the daily development of actors in action.

Declining the ecological approach in these terms, which are the implications for the study of maintenance-in-use? I want here to quote Suchman, who wrote, about a bridge-building process, that its materiality is inseparable "*from the network of social practices – of design, construction, maintenance and use – that must be put into place and maintained in order to make a bridge-building process possible, and to sustain the resulting artefact over time*" (Suchman, 2000: 316). According to the author, the problem deals with different orders of stabilisation that have to be harmonized and aligned. The principle under which this alignment may happen are the practical consequences that the bridge-building and its life might have in relation with different sociomaterial assemblages (the constructors', as well as the designers' and the citizens').

Just in practice this alignment of actors, technologies and logics of action comes into being. The strive for harmonization emerges from the web of interacting and overlapping practices. Maintenance-in-use can be thus seen an emergent and provisional of the attempt at aligning different programs of action (Feenberg, 1999) mobilized inside diverse sociomaterial practices. These practices differently mobilize diverse knowledges, artefacts, technicalities, old and new technologies, plans and strategies, narratives, in multiple 'meaningful actions' (Lave & Wenger, 1991).

To sum up, practice is valuable for my work to a double extent: it is the interpretative lens through which analysing the phenomenon of maintenance-in-use, so to say the epistemology of the

[18] Which is the focal point of what Gherardi and Nicolini labelled as 'entrepreneurial approach', opposite to the ecological one (2005).

research aiming at understanding the situatedness and contingency of organisational rationality (Corradi & Al., 2010). On the other hand, it is also the 'locus' in which the production and reproduction of social relations takes place, carrying specific consequences with them (*generativeness*).

Owed to all this, I argue that such a perspective can contribute to shade a new light on the traditional approaches on information systems' maintenance, for several 'good' reasons:

- it positions at the same level all the actors, assemblages and practices, taking into account how the sociomaterial arrangements are mobilized in the contests. Consequently, maintenance-in-use can be understood as the emergent process in which different skills and professional knowledges come into stage, moving away from the idea of maintenance as a matter of programming and planning. In this renewed framework, professionalism, technicalities, organisational roles are resources for action which get mobilized in mundane activities;
- it reconsiders the problem of alignment in terms of strategy-in-practice (Suchman, 1987). Maintenance-in-use rises from the interacting mobilization of different contextual and contingent programs and antiprograms of action (Latour, 1992). Therefore it is not possible to talk about a strategy of the 'organisational management' opposed to an other of the 'infrastructure management' (Henderson & Venkatraman, 1993). On the contrary, it makes much more sense to account for the *performed* strategies. Moreover, the enactment of the logics of action definitely release maintenance from the idea of alignment as a goal to be reached, revealing how it is inherently an open-ended process of continuous assembling and re-assembling things in practice.
- it allows to understand both agency and the situated dynamics of change in terms of relational movements among conjoint mobilisations of sociomaterial assemblages.

The practice-based approach suggests to look at the reiterated and stabilized ways of doing (routines) and the sense-making process that sustain them over time. Maintenance emerges from the interaction of settled and more or less institutionalized ways of doing, as well as from the negotiation of different programs in action, the hybridizing of knowledges and languages and from the circulation of horizons of meaning.

In conclusion, an other aspect has to be openly taken into consideration: looking at information systems as processes in the broader context of professional practices (Tzoukas, 2009) naturally implies that keeping information systems alive is just one among the others (and perhaps more important) organisational goals. Therefore, not all the noticeable practices are enacted with the aim at preserving systems' operability and workability. Therefore, since it is impossible to think about

completely disconnected practices, it is possible to hypothesize different contributions from the diverse practice towards the shaping of maintenance-in-use. For this reason the aim of the research will also be the individuation of different groups of practices with reference to the attitude towards technology's implementation they mobilize, and then reconstructing the connections among them to see how they contribute to shape the phenomenon.

This latter point draws back the argument to the issue of users and participation in systems development, maintenance and use. In the upcoming section I will then sort out the connections of these topics with respect to the more general theoretical framework I have reconstructed heretofore.

3.3. PARTICIPATION IN MAINTENANCE-IN-USE

In these final chapters of the first part, I want to make explicit how the concepts of users and participation enters the conceptual framework of maintenance-in-use. In doing so, I have first to challenge the acquired closure made up by the mainstream literature and then coming out with a different perspective on both users' definition and the meaning of participation.

Generally speaking, I can say that the deductive approach assumed in the reviewed literature did not seem in tune with either the epistemology of the research and the field's findings (see Part III). Therefore, I preferred to leave a more 'grounded' space to inductively reconstruct a framework informed by the empiric evidences.

In the first part of this chapter (Ch. 3.2.1) I will propose my personal approach to users and participation, whilst in the second I will embed them in the specific theorisation of maintenance-in-use (Ch. 3.2.2).

3.3.1. Redefining users and participation

The mainstream Information Systems literature makes an extensive use of the subdivision among Management, Programmers and Users (e.g. Avison & Fitzgerald, 2000). However, aiming at reconstructing the interactive dynamics rising from the workplaces, I argue that my research cannot benefit from such a rough classification. I obviously do not consider the classification wrong *per se,* but I find it too 'coarse-grained'. Take for instance management: one can easily object that in most organisations there are more than one level of managers, for different divisions, for instance. Could one possibly affirm that they all share the same logics of action and have a unique strategy towards technology? I argue that the answer should be negative. Similarly for 'technicians': programmers, supporters, analysts are all generally included under the family of computer-skilled technicians, who manage the code and steer system development, without taking into account the profound differences among them (Read, 2003). Users then seem to me the most heterogeneous class: it is sufficient to look at universities, whose information system is used by professors, students, administrative personnel (Pollock & Cornford, 2004), or hospitals with doctors, nurses and patients (Bruni, 2005), or multinational firms, with dispersed bases all around the world (Sole & Edmonson, 2002).

If this classification answer the question 'which role does a group covers in the organisational structure applied to information system development?', I think it would be much more interesting in my research to question what the role that each individual or social group *plays* in maintaining the system alive would be. To this extent, professional knowledge, structural power relations, and the way the system is enacted represent *resources* which the different actors exploit in performing daily activity.

To focus on the engagement in maintenance-in-use represents a way to highlight users' contribution in shaping technological trajectories, being the topic largely neglected in the traditional account of maintenance (Mackay & Al., 2000).

Even further, I can also challenge the mainstream idea of calling 'users' just those who deal with the interface. To me, IT support use the system as well, and managers use the systems' outputs – which is, by the way, the main reason for systems' implementation, namely using the information it provides. The reader may agree with this critique or not, but I argue that to call 'user' everyone who enact the system in practice leaves a wider space for the comprehension of how information systems-related phenomena take place. Personally, I found a useful criterion to group actors (either individual or groups), according to the logics of action toward technology that they enact. In other words looking at the dominant programs and the opposite antiprograms which interact in the workplaces (Feenberg, 1999).

To this extent, I embrace the definition given by Lucy Suchman, who said that 'user' "*works as category describing persons differently positioned, at different moments, with different future investments in projects of technology development*" (Suchman, 2007: 279). With such a definition at hand, there is space enough to consistently taking into account use, non-use, misuse, workarounds, resistances, rejections. They all represent practical contributions in shaping the process of maintenance-in-use.

Mutatis mutandis, a similar reasoning could be also applied to the concept of participation. To participate is a phenomenon which has been largely studied with reference to citizens' involvement in democratic decision making processes (e.g. Milbrath, 1965; Pateman, 1970). From the early seventies, it has been also applied to the study of information systems design[19] (e.g. Ehn, 1992; Beck, 2002), to market products' development (Von Hippel, 1986, 2001) and more generally in relation with the topic of 'technological representation' (Sclove, 1995; Feenberg, 1999).

In the specific of information systems design, the debate on users involvement in shaping technological contents led to a general agreement on a classification which assumes the point of

[19] See the dedicated *Communication of the ACM* special issue (Cohen, 1993)

view of the systems and distinguishes them among (Ciborra & Al., 1984; Kareborn e Stahlbrost, 2008):

a) Systems designed *for the users*, in which the product is designed on behalf of the users, trying to address the pretended requirement of a potential user;
b) Systems designed *with the users,* whose design is still steered by programmers whilst the contents are co-designed with the users;
c) Systems designed *by the users*, in which these latter develop the product with programmers' support.

To me, this definition carries with it some fundamental criticalities. I do not want here to pull them out, it is just enough to acknowledge that it does not tell anything about the processes of participating[20]. Indeed, it is a rather static view of participation, which is accounted in a kind of 'ex-post evaluation': one looks at the implemented system and 'judge' whether the embedded structures are representatives of users requirements or not. Nonetheless, the risks of participation are already extensively documented (see Paragraph 2.4), meaning there is a lot to be learnt in analyzing the dynamics underneath the 'labelled participation'.

I remember a meeting in which I overheard a District Manager saying to a colleague of hers "*Do you remember when the Regional Board participate us?*"[21] (Charlotte, District Manager, T/A[22]). The question really astounded me, for it clearly put into stage the difference between an active participation and a passive involvement. Such a distinction has been already addressed in sociological terms. Gallino (2006), in his sociological dictionary, distinguish between two '*rather different*' coexisting meanings of participation:

a) In the 'strong' acceptation, to participate in the act of concurring in determining the main goals of the community, having a concrete possibility to do it, in a state of formal equality in relation with the other member of the group;
b) Diversely, in the 'weak' acceptation, to participate means to take part, more or less regularly and centrally, to the specific activities of a group, no matter the power of influencing group's decisions one might have.

[20] True, in the last years PD community developed a renewed interest on the theme, mainly challenging the classification in object in light of new domains of application and theoretical achievements (See, for instance Beck, 2002)

[21] "*Ti ricordi quando la Regione ci ha partecipato?*". Such an expression is particularly tricky to translate: also in Italian it does not make perfect sense, because the verb 'to participate' (*partecipare*) can not be declined at passive. To use in such a way, it made sense in the context of the speech since the District Manager deliberately used the term to show how in that case participation was simply a 'masked' involvement.

[22] T/A: Translation by the Author.

Whereas the system's design-based classification looks at the problem through the eyes of the system in light of how users got into its development, this second distinction comes closer to the research interests, questioning the actual capacity of determination the participants might have.

Anyway, before pushing the argument forward, it is the case to clear the space for potential misunderstandings and openly clarify that, given the practice-based approach I am applying, I do not assume the concept of participation to the extent of 'taking part'. Indeed, in this stream of literature, participation concept has been largely and extensively analyzed, right from the first contributions on Communities of practice (Lave & Wenger, 1991). According to Wenger, to participate is either to take part and something more, since it "*involves action (taking part) as well as relationships and connections to others in the community. There is something enduring about 'participation' which marks it off from a more limited forms of 'mere engagement in practice'*" (Wenger, 1998: 57). To participate thus overcomes the 'simple' act of being part, but is rather a 'meaningful taking part', in which the meaning is given by the texture of interactions which ties participants to the reproduction of practices (Hadley & Al., 2006). True, in the perspective I am assuming, to take part to a process is anything but 'consequenceless' and I can end up by saying that to be involved contributes somehow to shape the borders of maintenance-in-use. Anyway, to this extent 'to participate' can be easily substituted by 'practicing'. Moreover, as Gherardi argued (2009), also the concept of communities loose cogency (and that is particularly true in my case, as the argument will show), considered that "*placing stress on the community implies the ontological priority of the subject as the source of action, while placing the stress on practices implies that the becoming of the subject results from the connections-in-action*" (Gherardi, 2009: 528). Hence, not only to participate overlaps the concept of meaningful taking part, but it is also useless to understand how the phenomenon get shaped by the connections-in-action. The stress on practices, which I openly assumed talking about assemblages in an ecology of practices, just addresses this latter research interest.

What is worth in talking about participation, then? What is the added value for the comprehension of maintenance-in-use? To understand it, I argue that it is necessary to shift from the declination of participation as something inherent to taking part to the perspective of an activism towards a process. Defining users as everyone who has an investment in projects of technology's development, I see *participation as one of the logics of actions mobilized in practice*. To participate will be hence a proactive orientation towards the systems, which is differently mobilized, at different times and in the contest of different practices.

3.3.2. Participatory practices, but not just that

Using a metaphor, an information system could be seen as a short blanket which covers more people: everybody needs to sleep warm and tight, but it is impossible owed to the dimensions of the blanket. Hence, there would be a lot of movement during the night: who is sleeping with feet uncovered will try to keep them warm, no matter if the posture is unnatural. When the painful posture becomes more intolerable than the uneasiness of sleeping with iced feet, one will wake up and maybe try to 'steal' the blanket to the one who is sleeping peacefully at warm. In doing so, one will enable a relational movement of actions and reactions. With information systems it is more or less the same: some groups of users, managers and developers will 'stretch' the system so that it will better fit their daily practices, whilst an opposite group will strive to bring it back to the initial position.

Out of metaphor, being the alignment an ongoing attempt of harmonizing work, organisation and technology, it is quite hard to conceive a moment in which all the aspect of organizing perfectly match everybody's needs (someone has to sleep with feet uncovered, so to say). Therefore it is unavoidable to acknowledge that maintenance-in-use is determined by the contemporaneous presence of aligned and dis-aligned elements. Both systems' workability and operability are preserved as long as the degree of alignment is satisfactory enough for the majority of users. This ongoing attempt to harmonically enroll technology into different arrangements is hence the source of change.

Since I assumed the organisational environments as ecologies of practices (see Paragraph 3.2.2), it is consequently evident that alignment is a matter of interlacing and interactive practices. Well understood, there are so many different practices that get enacted – at the same time in different settings – that to map them is not only impossible, but also of scarce interest for the analysis. The researcher has thus to question whether is possible to pick out specific practices, particularly identifiable by both practitioners and the researcher, "*which anchor, control and organize others*" (Gherardi, 2009: 524). In the case of maintenance-in-use, what is at stake are those practices, if any, which mediate the alignment by individuating peculiar sociomaterial assemblages.

On a theoretical level, I argue that at least three different types of practices can be gleaned, according to the commitment they mobilize: they can be positioned along a continuum in which we have technology on the one hand, and the workpractices on the other. I respectively label these practices 'participatory', 'applicative' and 'preservative'.

a) **Participatory practices**. I define them as relative stable ways of doing which mobilize logics of action *directly aimed towards a co-development of the system-in-use*. They mobilizes things so to make a change in the system, challenging the black-boxed structures. No matter if they end up to have an actual impact on the code, they look at future implementations. Therein, users put in motion their activism toward technology. Differently from the others, participatory practices decisively overcome the borders of professionalisms, assuming the system's implementation as the focus of mobilisation. Here, both the system and the workpractices are supposed to undergo a change;

b) **Applicative practices**. The term 'application' directly refers to Orlikowski's work (2000). The author uses it to define specific ways of enacting technology in practice, in which "*users have moderate, competent or extensive understanding of their technology at hand, and are either moderately or highly motivated to use it to enhance their workpractices*" (Orlikowski, 2000: 422). These practices mobilize different social groups but they do not necessarily prefigure an intentionality towards either technology structure's and the technology-in-use changes. On the contrary, they are directly aimed towards workpractices' enhancement, and their technology enactment is primarily interpretative. As Orlikowski herself pointed out, application does not challenge the organisational structure, neither technology, but it acts within the borders of workpractices.

c) **Preservative practices**. Under this label I position all those practices that tends to 'moderate the intrusion' of technology into the already existing workpractices. They either mobilize technology in a minimal manner, or defer to alternative technologies which better fit practitioners' ways of doing. Opposite to the first two, these practices have a rather 'shorter breath', being specifically anchored to a determined and concluded workplace or professional practice.

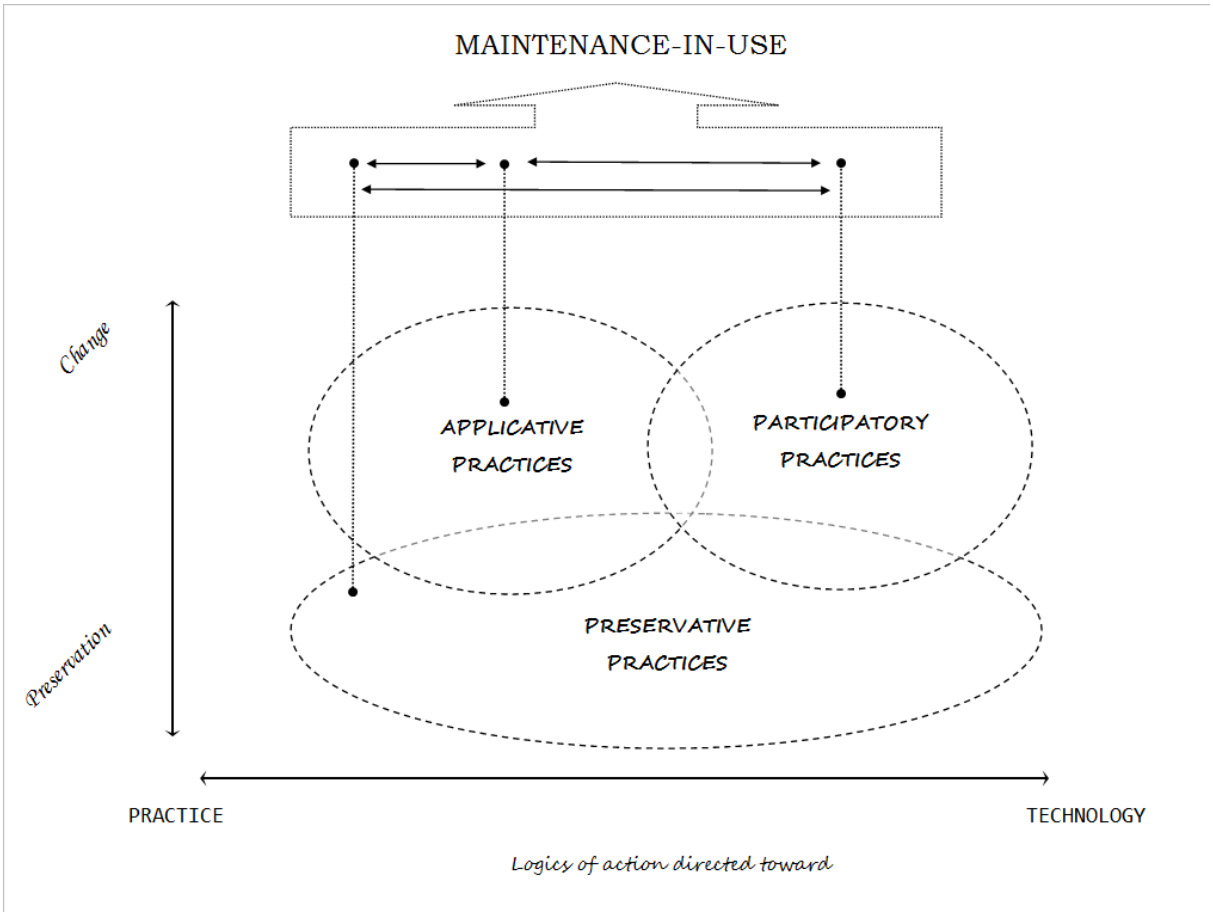
Obviously, to subdivide the multiple practices into three categories has mainly an analytic end. Indeed, most of the practices are interlaced, for they mobilize common elements and interact each other in creating the social order. Hence, to group them does not mean that they are self-standing and disconnected. On the contrary, they could performed by the same social groups in the same or different contexts; they differently arrange things so that they are even mobilized conjointly within the context of the same activity. Further, they cross the boundaries of space and time, since they shown to be similarly put in action in distributed settings following some common patterns and assemblages. Finally, from the point of view of the workpractices which overlap and mobilize all

the three groups of practices, they do not belong to a unique group. None of them. On the contrary, they differently cross these groups and re-position themselves over time.

Here below I try to graphically reconstruct this model, although I am aware that it is necessarily a simplification of reality. Nonetheless, it is useful to both briefly summarising the standpoints of this theoretical frame I am about to conclude, and to set the basis for a more detailed definition of maintenance-in-use.

In the picture I position the three families of practices along the space individuated by two continuum. Horizontally ('X' axis) there is the logics of action's orientation, which can either tend towards technology or practices. On the 'Y' axis, there is the polarisation between a preservative approach and a more dynamical one. At the bottom I individuate the 'preservation area', in which I positioned those practice that are more critically concerned with maintaining things as they are; to the opposite, the area of 'change' includes those practices which are more oriented toward questioning ways of doing.

Picture 3: Maintenance-in-use as the resultant of interacting practices



Closer to the virtual intersection of the axis stays the family of **preservative practices**, since they either focus their agency toward practice and specifically aim at preserving the *status quo* of technology's 'intrusion' in the domain of rather institutionalized ways of doing. They covers the whole field of logics of action because, on the theoretical level, they could either tend towards workpractices' preservation or more explicitly mobilize in opposition to technology (no matter what the content of practices might be).

Decisively oriented toward change, but still focused on workpractices is the group of **applicative practices**. I set them a little bit far from the practice's pole since their technology's enactment is much more opened and – I can say – constitute a premises for the technological modifications. Indeed, they are much more concerned in aligning technological elements into practice and they are either proactive toward change.

Finally the family of **participatory practices** occupies the angle closer to technology and change pole. Narrowly concentrating on technological development, it is there that the flywheel[23] of evolution could be found.

I deliberately intersected the circles which 'contain' the three families, meaning that they share elements, routines, and that they are enacted in similar (when not even the same) activities. From the centre of each circles departs a line at the end of which I draw bidirectional ties: they represent to me the interactions among the different practices; they encompass objects and people that flows, the relation dynamic of arranging, disassembling and rearranging things and the mutual constitution of meanings that rise from the encounters of different sociomaterial assemblages. I argue that maintenance-in-use defines from this multiple, situated and provisional attempt of aligning things.

Finally, although it does not appear in the model due to simplicity purpose, those practice relates and shares elements with the broader ecology of workpractices which not primarily mobilizing the system contribute to shape organisational, professional and social courses of action. In addition to that, I positioned preservation and change on the Y axis in order to analytically frame the different approaches. However, they should be thought as contingent elements, as well. This mean, they are enrolled in practice as everything else in the model, so that they could displace practices according to how they get mobilized. It would be to much of a stretch to report this in the graph, but I think it is an important element to acknowledge.

[23] Further on this work I will specify this frame in light of field's data (See Ch. 9).

At the end of this chapter I want then to come out with a more reasoned definition of maintenance-in-use (see Chapter 3.1), that could be seen as *the resultant of the process of assembling things together so that the system keeps having a centrality within the environment in which it is implemented. Such process emerges from interactions unfolding in an ecology of practices, among which a fundamental role is played by the technological practices which mediate it: participatory, applicative and preservative.*

PART TWO

RESEARCH FIELD(S) AND METHODOLOGY

* * *

Given the theoretical frame elaborated in the first part of this work, the choice of the research technique has been a natural consequence. Indeed, both the ontology and the epistemology underpinning the research suggested to search *in vivo*[23] for the developing of the phenomenon under scrutiny. Hence, the research belongs to the family of *case studies* (Stake, 1995) and ethnographic methods. To me, the combination of the two seemed the most suitable and fruitful choice to both address the gap individuated in the reviewed literature and to account for the concrete development of the ongoing phenomenon of maintenance-in-use, as it has been conceptualized in chapter 3.

Where the research got settled and which techniques have been applied are thus the focus of this second part. Talking about the research field, the choice to look at the Italian welfare domain, and the Information Systems on Social Services (ISSS) in particular, is due to two main reasons: first of all, whereas the literature is abundant on Health information systems[24], on the 'twin' domain of social assistance the corpus of works is rather scarce. That is perhaps due to the fact that this domain is quite 'young' (at least in relation with the Health one), and still not completely defined and institutionalized. Indeed, if in the Anglo-Saxon world the debate on social work profession is already aged (e.g. Toren, 1972), in Italy this community just recently achieved autonomy (Donati, 1985, Villa, 1992). Hence, the boundaries of social assistance still remain partially undefined, overlapping with health domain matters such as nursing (Bowker & Star, 1999), or childcare (Azad & King, 2008). A second order of problems concerns the distinction between welfare policies and social work. This longstanding dichotomy (Folgheraiter, 2007) affected the Italian research community on ISSS, which mainly focused on the side of policy making evaluation and planning (Palumbo, 2001), whilst almost nothing has been written about ISSS at work (namely in relation

[23] This expression comes from the 'Grounded Theory' approach (Glaser & Strauss, 1967), which I use to the extent of analyzing phenomena while they are developing in the field.

[24] The topic has been addressed from several points of view by communities of studies of all sorts, so that is impossible to cite punctual works which stand as representatives for the complexity of scientific production.

with applied social work), despite some interesting researches are already available (Broadhurst & Al., 2009; White & Al., 2010).

Owed to this state of play, the framework of studies left several questions opened (see Introduction), and therefore encouraged the decision to focus on Social Services' Information Systems, which are themselves a rather new reality in the Italian environment (Mauri, 2007).

Talking about the methodology I applied, a situated study required the use of ethnographic methods, the participant observation (Gobo, 2001) in particular. Anyway, taking into account the specificity of the Italian welfare organisation (see Chapter 4.1) and the consequent peculiar implementation of ISSS, I had to face the problem of accounting for a distributed information system which crossed different hierarchical level and professional communities. Hence, more then a traditional ethnography, I turned to the Multi-Sited Ethnography (MSE) (Markus, 1995), which assured me a more suitable set of methods and techniques to explore a dispersed, relational and changeable phenomenon.

Consistently with such a premise, this part will first of all present the Italian ISSS, accounted in relation with both the broader national welfare system and the evolution of social work. Looking back to the historical process which led to ISSS definition and analyzing the architecture, I will then explain why ISSS are in Italy a regional matter and therefore it ought to be declined at plural.

Given the nature of the Italian ISSS, the research developed on a regional basis. More in specific, I choose for Friuli Venezia-Giulia (FVG), a north-eastern territory at the borders with Slovenia and Austria. There, ISSS firstly entered the statutory law and found a complete and structured application. Nowadays, Friuli Venezia-Giulia's ISSS relies upon a web-based data collection application called Digital Social Folder (DSF), a rather unique example of welfare-dedicated software, implemented as of 2005. Much of the research will gravitate around this tool, so that it is fundamental in here to reconstruct the process which led to its implementation, a long history started in the middle eighties.

Once described the research field – which it is actually much better to decline at plural –, I will turn to the methodology, explaining the added-value of applying the Multi Sited Ethnography to account for the historicity, multiplicity and the relational implications of ISSS's maintenance-in-use in the contest of both the social work and the welfare policies. I will then look at the research path, showing off the process of case sampling, data collection and analysis. It will give the way for a reflection on MSE, the implication of being part of the setting one enters and on the generativeness of doing research while doing it (see Conclusions).

4. THE ITALIAN INFORMATION SYSTEM ON SOCIAL SERVICES (ISSS) AND ITS REGIONAL IMPLEMENTATIONS

In this section I will present the more general context of the Italian welfare information system in light of the recent evolutions of its domain of implementation. Indeed, it is not possible to talk of these types of information systems without following the evolution of welfare orghanisation, as well. Hence, I will start by briefly reconstructing the historical process who led to the Italian Information System on Social Services[25] (ISSS) and the organisational architecture underneath it. In the second section I will closer focus on the regional level, for it is there that the implementation of ISSS took place. Being a regional matter, it is then the case to look narrowly at Friuli Venezia-Giulia's case, in order to better understand the field in which the research got settled.

4.1. ISSS AND THE ARCHITECTURE OF THE WELFARE DOMAIN

The implementation of Management Information Systems in both welfare and health system is nowadays a well-established reality in the Italian context (Mauri, 2007). True, in the health domain the acknowledgement of an information system's necessity came before the welfare, and it concretized with the enacting of Law 388/1978. Differently, the welfare domain had to wait until the beginning of the nineties and further on till year 2000. Therefore, the Health Information System is "*much more institutionalized. However, if there are good technical reasons to distinguish it from the 'younger' welfare one, they could not be separated in practice.* […] *The distinction blurs once into the real life integration between welfare and healthcare*" (Carli Sardi, 2009a, T/A).

Hence, although they are actually two distinct elements, they both require similar peculiarities. Indeed, these two domains of application need a custom and customizable system, with an high degree of integration, just because of the reality they are called to account for, and namely the specificity of clients' pick-up: the complexity of social distress, the multi-problematic cases, the

[25] In Italian the acronym is SISS, which stands for Sistema Informativo dei Servizi Sociali (see Abbreviation table).

impossibility of a daily monitor, the interlaced care processes, and so on[26]. Moreover, these types of management information systems have not only to fit the specificity of clients, but also those of the work organisation. That is the main reason why, in order to understand the ISSS history, it is necessary to look at it combined with the main evolutions of social work discipline and its field of application, precisely the welfare system and the social services' provision.

To talk about welfare in the specific of this research means to look at all those interventions set up by municipal departments to face the social distress of the population. With reference to these intervention, the Italian legislation talks about 'Social Services'. The definition of welfare's competences just recently came to a stabilisation. Its historical development began with the issuing of DPR[27] 616 on 24th July 1977, which decreed the delegation of several competences from the central authority to the periphery; among the others tasks, there are also the social services (art. 17). However, that delegation has not been accompanied with the enacting of applicative guidelines, implying an ordering vacuum and an inhomogeneous development of both local ordinances and practices. Both at the regional and sub-regional level, noticeable differences began to rise (Madama, 2008). A coherent definition of Social Services boundaries of application have been drawn just at the end of the nineties with the DL[28] 112/1998 (art. 128) and later reprised by Law 328/2000. They both regulated all the activities aimed at setting up and providing social support (either free and on-payment services and economic funding), in order to face and get over those situation of need people might encounter in their life, with the exception of those provided by the Healthcare system, the Social Security (National Insurance) and the Department of Justice (Franchi, 2009). The range of tasks is quite wide and it goes from professional support to homecare, from meals supply to economic funding, from homecare services to retirement housing, and so on[29]. Welfare domain differs from the Labour Market's and the Health's, which are in charge to Provinces and Regions respectively[30].

As said, a consistent organisation of the discipline came just on 2000 with the *Social services integrated system institutive act* (Law 328/2000). This organizing act is particularly central to the research object because it finally acknowledged the need for a sector-dedicated information system.

[26] For a close examination of social work profession, social problems, interventions and the ISSS, see Papini (2009), which gives back a rather clear frame of the complexity of client-service professional contents.

[27] Decree of the Republic President.

[28] Law Decree (*Decreto legge*)

[29] All the tasks I cited here are families of professional interventions regulated by Law 328/2000, to which I cross-refer for further examination (specifically to art. 22, c.2 and 4)

[30] Italian administrative subdivision (from bottom to top): Municipalities, Provinces, Regions (and Self-governing Provinces of Bolzano and Trento), State. District are 'administrative interfaces' in Health and Welfare domains.

The national Information System on Social Services is presented as a central tool '*to ensure a complete knowledge of social distress* […] *in order to be promptly provided with the necessary information for programming, managing and evaluating social policy*' (art. 21, c.1, T/A).

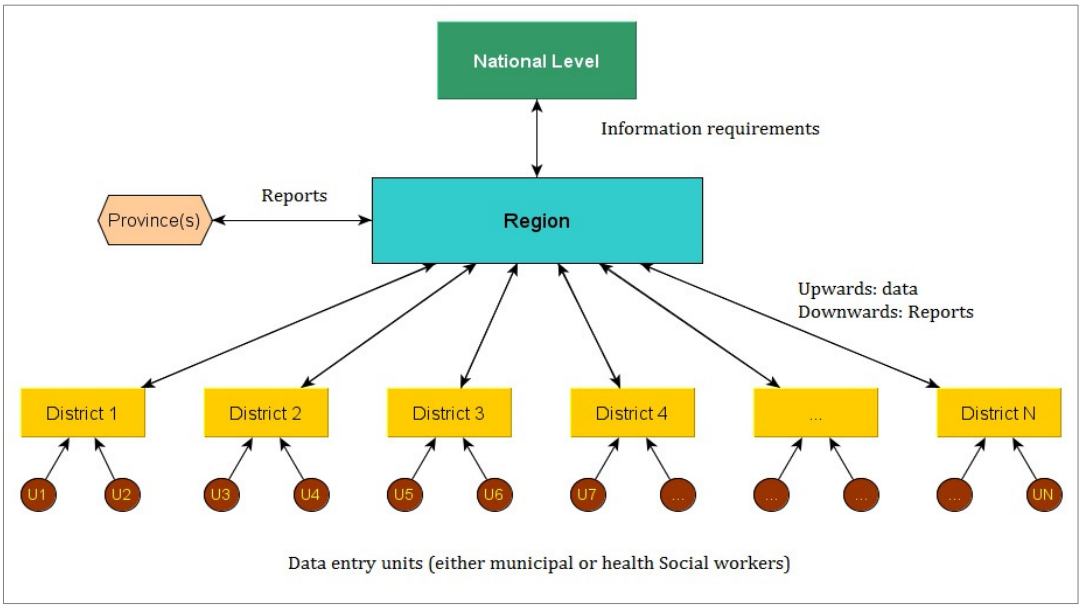
Declined as such, to talk about ISSS is just partially to talk about specific software, but better about a complex integration of data sources drawn together in the context of a domain-specific information project. Indeed, different information needs are required at different levels so that the ISSS encompasses both project-supporting devices and lower-level's operative tools. The National level established specific 'information needs' to be fulfilled through the combination of multiple sources, so to have an holistic comprehension of social distress not just from the clients' point of view but at the broader socio-demographic and economic level (Mauri, 2007). In a recent work, Carli Sardi (2009) tried to summarize these multiple sources at the basis of ISSS:

- Registry, health and social services statistics (from both municipalities and hospitals);
- Clients statistics from the Districts;
- Clinical registries;
- Districts reports and relations;
- Qualitative information (formal and informal) coming from the stakeholders and the broader third sector;
- Structures, resources, personnel, funding censuses;
- Project-based information (e.g. elderly people, childcare, and so on).

Shifting from the contents to the organisation of ISSS, the architecture had to be necessarily designed on the institutional organisation of the welfare domain as framed in Law 328/2000 (Sgritta, 2003). Such an organisation is reconstructed in the picture here below. In order to complete the picture, in Table 2 I also provide the reader with a reconstruction of ISSS sources grouped according to the releasing Institution.

The central information system is organized by the National Health and/or Welfare Office and it is constantly connected to the SISTAN, the National Institute of Statistics. The Central Administration is thus charged with the organisation of ISSS. Since it has been structured for supporting the national policy making and evaluation, the national level has to establish the information requirements to be fulfilled by the peripheral institutions. In doing so, its task is to coordinate data gathering, organisation and transmission (Mauri, *ibidem*; Carli Sardi & Barneschi, 2009).

Picture 4: ISSS institutional architecture



Source: Mauri (2007), author's rework

Table 2: Sources of ISSS, institutional level grouping*

National	Regional	Provincial	Local (Districts)	
			Municipal	**Health** (Hospitals and Districts)
Demographic information (Istat - SISTAN)	Reports	Labour market reports	Clients data	Patients data
	Structures, resources, personnel, funding censuses	Structures, resources, personnel, funding censuses	Structures, resources, personnel, funding censuses	Structures, resources, personnel, funding censuses
			Registry data Collection of qualitative information from the civil society Project-based information Relations (clients)	Clinical registries Collection of qualitative information from the civil society Project-based information Relations (patients) Epidemiological statistics

* Not everywhere the municipal and the health level are disjoint (see chapter 4.2)
Source: Carli Sardi (2009), author's rework

However, in light of tasks' devolution, system's core shifted to the Regional level. Indeed, regional authorities are either primary managers of data patrimony and producers of *official* data. By law, they have to practically implement the information system and its connections with other systems of social interest (healthcare's and labour's, primarily).

Much more peripheral is the Provinces' role; they are charged of welfare policies implementation's support and of lower administrative levels' coordination. They have also to set up Welfare Observatories in order to keep socially relevant phenomena monitored.

Municipalities represent the lower institutional level of the welfare system, specifically the ones who are charged of both the social services providing and the local policy making activity. They are organized together in wider area interfaces called 'Districts'. Data gathering task is delegated to them, being the closest to data source. As important stakeholders, they have to be provided with reports as fundamental basis for local welfare policies planning (Heeks, 1999) and therefore they have to be either provided with regular reports or with autonomous systems of database querying.

Designed as such, to look at ISSS mainly means to look at its local implementations. Therefore, the unit of analysis should necessarily be the regional domain. The centrality of such an institutional level not only relies in the renewed centrality stated by the law, but also in the history of ISSS, which has been to a large extent a regional matter. What I am about to do in the next paragraph is thus to develop this latter argument.

4.2. ISSS, A REGIONAL MATTER

The DPR 616/1977 delegated social services competences from the National level to the Municipalities. However, the lack of applicative guidelines for welfare policies and practices led to different regional implementations (Madama, 2008). More or less a decade later, claims for homogeneity kept on rising from several territories. In 1987 a Regional Welfare Managers' group licensed a document called "*Social assistance and social services reform act's draft and social security board foundation proposal*"[31], in which they stated the need for a unique information system on social services in order to map the situation across the whole national territory. In the very same year, the Home Office board acknowledged such a claim and constituted a national

[31] Such document is cited in Mauri (2007), although it has not been possible to recover any reference, perhaps because it was an 'Internal working paper'.

working group for the National Social Services Information System (NSSIS[32]). Yet, it expired very soon (it worked from 1987 to 1992) due to the political earthquake that toppled the so-called 'First Republic'[33]. For almost a decade nothing has been concretely done to retrieve the project. Just with Law 328/2000 the topic of an information system's implementation became actual again.

From the application of Law 328, integrated with the 2001 National Social Plan, a special Commission on ISSS born in spring 2001 (DM 20th April 2001). This Commission was charged with "*make proposals on both ISSS contents and operational models, and to suggest tools through which to implement the different operative levels of ISSS*" (Madama, *ibidem*, p. 77 T/A).

Despite this vacation of national proposals toward a Social Services' information base, several regional administration moved. Indeed, the rather wide spaces left opened by the application of the DPR 616/1977 allowed regional administrations to free-moving organize both social services and healthcare (and their integration). As a consequence, differences became noticeable from a place to an other. Consistently with that, several attempts of local information systems' design rose over time (Tuscany and Veneto before the others). Long before the release of Law 328/, local ISSS entered the statutory law of different areas (see Table 3, here below) (Bonfiglioli, 1991).

Table 3: Main references to ISSS in the Regional Statutory Laws before 2000[34]

Region/Local Institution	Reference
Friuli Venezia-Giulia	LR 33/1988
Sardegna	LR 4/1988 along with LR 8/1999; Social Assistance Plan 1999-2001
Self-governing Province of Bolzano	LP 13/1991
Self-governing Province of Trento	LP 14/1991
Toscana	LR 72/1997; DGR 687/1998
Abruzzo	LR 22/1998
Emilia Romagna	LR 3/1999
Umbria	DCR 759/1999
Basilicata	DCR 1280/1999

Source: FORMEZ (2003) e CISIS (2004); author's rework

At the time of the reform act's promulgation, the situation at the local level was thus already fragmented, not only from the point of view of welfare and health policies and practices, but also concerning the accountability systems.

[32] In Italian: SINSA (Sistema Informativo Nazionale Socio-Assistenziale)

[33] See http://en.wikipedia.org/wiki/Politics_of_Italy#First_Republic

[34] LP: Provincial Law; LR: Regional Law; DCR: Decree of the Regional Council; DGR: Decree of the Regional Committee.

This state of play got somehow institutionalized by Law 328/2000 which stated, given the architecture of welfare domain, the compulsoriness of a regional-based ISSS implementation (Mauri, 2007). Specifically, it established that: a) the Local Welfare Plans (coordinated by regional administrations) have to achieve the data gathering goal, and b) the National administration "*individuates, in the domain of already existing information systems, the requirements for the technical coordination with the Regional level*" (art. 21, c.3 T/A).

Anyway, once again this consistent declaration has not been followed by a timely applicative legislation, so that local institution have been left to autonomously set up either the more effective instruments for the ISSS implementation and the integration with the Healthcare domain. In consequence to that, local regional administrations opted for different kinds of integration: Lombardia and Veneto choose for a combined social-and-health information system, in which data gathering was demanded to the Health and Social Assistance departments[35]; elsewhere (e.g. Emilia-Romagna and Tuscany) Provinces are charged of data collection; finally, other Regions like Campania and Friuli Venezia-Giulia delegated such a task to municipalities and/or Districts[36].

Table 4: Local ISSS data gathering sources organisation, some examples.

	Institutional level		
	Provincial	**Municipal**	**Health & Social Assistance domain**
Data gathering task	Province	Municipalities Welfare Districts Aster	Health and social assistance departments
Examples	*Emilia-Romagna* *Tuscany*	*Friuli Venezia-Giulia* *Campania*	*Lombardia* *Veneto*

* Source: Mauri (2007), author's rework

Such a fragmentation means that the capability of the ISSS to produce an adequate knowledge is "*to a large extent based on the possibility to produce punctual and specific answers within bound and determined social contexts*" (Palumbo, 2001).

Thus, it is not a mystification to say that it is better the case to talk about Italian information system*s* (at plural). As said before, the research concentrated in specific on Friuli Venezia-Giulia's (FVG) regional system.

FVG is one of the first places in which the ISSS entered the statutory law (see Table 3). The reference is LR 33/1988 who established that the regional administration "*organizes the social*

[35] In italian '*Aziende Socio-Sanitarie*' (ASS)

[36] Depending if and how municipalities got together in wider territorial Unions (Districts, Territorial associations, etc.)

assistance's information system, coordinated with the health one and the more general regional information system" (art.9, c.1/l, T/A) whilst the Provinces are "*decentralized moments of the socio-assistance information system and coordinators of the local information flows*" (art. 10, c.1/d, T/A). Consistently, the municipal level is charged with data gathering task. Thus, long before 2000, the organisation of ISSS architecture have been locally drawn.

Nonetheless, it is just with LR 06/2006 that the ISSS achieved a consistent structure with reference to the national order. Therein, a dedicated article defined the contents, tasks and organisation of the articulated ISSS (art. 25). The ISSS represents a supporting device for the policy making and social policies' monitoring and evaluation (c.1); information is publicly available (c.2); Regional administration assures the coordination with both Health and Labour systems; in order to assure an integrated policy making activity, a continuous training has to be set up in agreement with the Provinces (c.4); finally, local institutions are called to *periodically* provide regional department with updated data (c.5). Importantly, municipalities do not solely provide data but they also "*concur in the accomplishment of regional ISSS*" (art.10, c.1/f , T/A).

The established fulfilment of information requirements has been achieved in FVG through the progressive implementation of a web-based data collection software called Digital Social Folder (DSF). This application has been designed on the basis of the former Paper Social Folder (PSF), a work-supporting tool used by local welfare departments. As of 2005 DSF became a unified device which represents still nowadays one of the most complete software for social services activity's reporting. In the next section I will hence focus on this tool, the point around which the whole research circles.

4.3. DIGITAL SOCIAL FOLDER: BRIEF STORY OF A LONG HISTORY

Friuli Venezia-Giulia (FVG) is thus one of the first regions who acknowledged the necessity of an information system on social services (1988). It would take twelve years for the national level to state the same. The history of the Digital Social Folder started even earlier.

1984-2000: FROM PAPER SOCIAL FOLDER TO THE FIRST ATTEMPTS OF DIGITALISATION

In 1984, a small group of social workers attending a training course came out with the idea of "*trying to organize social workers profession*"[37] (Mathilde, District Manager, T/A). They shared this idea with the regional manager in charge, who asked to the municipal administration the permission to give those social workers the possibility to work on that project.

Around 1987, they started a new group devoted to "*organizing the accountability of social work among the Regional territory*"[38] (*ibidem,* T/A). This group was composed by seven social workers and the regional manager in charge. They started by sorting out the prevalent types of social distress and the interventions set up to face them with the aim at immediately producing an artefact which could be useful for social workers' daily practice. In doing so, they studied similar attempts developed in other settings (Tuscany's Social Folder and Veneto's Health Folder) adapting them to the specificity of the regional welfare organisation.

The output was the Paper Social Folder (PSF), a "simple" paperboard envelop which required the social worker to write down some elementary information about their clients: personal data, diagnosis and interventions. Inside the envelop there was an empty space called "diary", in which social worker might post their impressions on the care process.

Hence, this folder represented the tangible product of a complex process of mutual confrontation. The group met on a monthly basis, and deeply reasoned on work practices, professional vocabulary, interventions time frames, and on the ways they used to perform care. The sharing of a "*common glossary*"[39] (Ophelie, District Manager, T/A) represented the first step in the organisation and standardisation of the FVG's social work.

Before officially releasing the PSF, social workers began to distribute that artefact among their colleagues across the whole regional territory and they moved over the workplaces on demand.

[37] "*Provare ad organizzare il lavoro sociale*"

[38] "*Organizzare la rappresentazione del lavoro sociale nel territorio regionale*"

[39] "*Vocabolario comune*"

There, they sensitized colleagues to social folder's use, they explained why it could have been useful for their job and they collected impressions, suggestions and notes on contextual use and resistances. They shared the evidences in the steering group's meetings, which didn't stop to take place in the meanwhile.

The nineties represented the period in which Social Folder got implemented and consolidate its position within social workers' practice. This process was anything but linear and unproblematic. On the contrary, the aim of social workers at preserving their professional autonomy led up to diverse resistances to standardisation. This ambivalent idea of professionalism is absolutely interesting. On the one hand, the working group conceived standards as a mean to give legitimacy to social workers' practice: the introduction of 'objective' criteria aimed at homogenising practices so to make social work a 'profession'. On the other hand, the resistances to standardisation expressed the nature of what social workers thought to be their professional 'nature', and namely an artful process of copying with clients' condition and seeing them out of it. Moreover, as I will the occasion to explain further on this section and in Chapter 7.1, there is a substantial difference between PSF's standards and DSF's: as far as the paper folder addressed social workers' practice and strived to introduce some kind of shared criteria, DSF standards partially moved away from the specific domain of work and aimed at accounting for clients services from a statistical point of view.

Coming back to historical reconstruction, in the fall nineties the Regional Department, supported by the regional software house (recently privatized), began to structure a digital version of PSF; regional management was actually searching for a unified system which might have provide them with consistent information for the policy making activity. Being at the very beginning of the 'computer revolution', they choose to implement an Access-based system, as it was the most suitable and advanced technology available at that time. They distributed these standardized Access files across the Region, one copy for each District. There, data was entered by a dedicated employee (hired thanks to the regional funding allocated for a project on childcare), who gathered them directly from the social workers. The latter were thus charged to provide aggregated data on demand.

Before 2000 however, the Regional territory was not yet completely covered by broadband connection, and not all the offices were already provided with personal computers. Therefore, data collection was extremely time and resources – consuming, since the programmers who worked for the Regional Department had to commute across the territories to handily collect the digital files.

According to the reconstruction of DSF designer (who was the only programmer specifically charged with DSF development at that time), after a stalemate period the improved technological availability led to a brand-new project of a web-based unified tool. DSF's history was thus starting.

2000-2007: THE PROCESS OF DIGITAL SOCIAL FOLDER'S DESIGN AND IMPLEMENTATION

At the very beginning and for almost a couple of years, DSF's project grown slowly, mainly within the virtual development environment and 'mirroring' the paper-based version of Social Folder, which acted as the standard.

Year 2004 represented a turning point for the concurrency of a deep restructuring of the regional welfare system. In year 2000 the broader Italian welfare system was reconfigured by Law 328/2000, which stated the necessity for the public administration to integrate the third sector and the civil society in the policy making processes. Indeed, from the middle nineties, due to both resources' scarcity and work overload, Public Administration realized to be unable to provide an efficient service by its own, anymore. The transition from the Welfare State to the networking paradigm was actually starting. At the beginning of the new millennium FVG's Regional Welfare Department released two parallel projects: the Territorial Healthcare Plans (THPs) and the Local Area Plans (LAPs), the firsts concerned with Healthcare (re)organisation and strategizing, the latter specifically addressing the Social Services' domain. They aimed at cutting both private subjects and civil society on welfare policy making, striving for an homogenisation in the offer and moving toward a progressive integration between the social and the health care.

DSF's implementation benefit from this process for three main reasons: a) it could take advantage of an already ongoing District activity of reflection and sharing; b) Local Area Plans implicitly required an improved system of accountability of welfare politics; c) Districts improved their legitimacy: they were charged with new tasks and responsibilities along with an expanded freedom of choice and consistent funding. Such a frame opened new possibility for District to concentrate on DSF implementation's project.

In 2005 Welfare Regional Department thus organized a new working group dedicated to Paper Social Folder's review and implementation. It was specifically aimed at in-depth reviewing Social Folder's categories and translate them into the web-based application. This group was composed by:

- The regional manager in charge (a new one, the former retired);
- Two consultants;
- Three programmers from the regional software house;

- More or less eight District Managers and/or social workers representatives[40].

This renewed group hence began to accurately review Paper Social Folder contents. Practitioners themselves expressed the need for going back to PSF, for it embodied outdated markers and fields, and asking for some hard-to-retrieve information.

The confrontation on which categories to embedded into DSF immediately shown the differences among the involved actors on both the logic of implementation and the goals to be pursued.

Indeed, Regional Department and consultants pushed for DSF to be designed for an accurate data gathering. That would have either enhanced the understanding of territorial needs and allowed the evaluation of implemented policies. What they had in mind was hence a policy making supporting device. Technicians, which were used to play an important role in the former design process, now 'shifted into darkness' because the consultants pretended them to be simply an executive arm, and therefore relegated them to a merely code-writing activity.

From the Districts point of view (and consequently the Municipalities they represented), I could recognize at least two opposite approaches: on the one hand, the improved managerial tasks delegated to the local administrators implied for them the need to be provided with consistent data for District's policy making. Hence, some of them claimed for a more management-oriented tool, in agreement with Regional Department idea of DSF. On the other hand, social workers – concerned with the practicalities of their daily work – asked for DSF to be a work-supporting, user friendly and the less time consuming tool as possible.

Thus, this tension between managerial and operational needs polarized DSF design. However, it did not narrowly overlap the hierarchical division between 'the regional' and 'the local'. On the contrary:

- By the years, Regional management shown to be sensitive towards social workers' claims and tried to address them as far as they didn't invalidate their goals;
- The opposite approaches assumed by Local representatives mainly depended on the specific configuration of regional urban settlements. Indeed, in FVG, around (few) highly populated municipalities there is a constellation of small towns. Due to the inhabitants amount and the available personnel, the firsts – who usually had dedicated data management employees – claimed for a managerial tool, whilst the latter for a work supporting one, since DSF was necessarily managed by social workers. According to Hans (former DSF programmer-in-chief),

[40] Their number varied from a meeting to another according to their availability.

> the main mistake made in software design has just been to consider every organisational configuration in the same way[41].

Hence, this group mainly focused on 'what' to embed into DSF. 'How' they did it seems to be now of fundamental interest.

From the point of view of system's design, any specific methodology has been directly applied. On the contrary, design developed in a very "*homemade fashion*"[42] (Hans, DSF developer, T/A), heavily based on *bricolage*, trials and errors: corrections, adaptations, mutual confrontations and negotiations occurred either before and after the implementation.

Interestingly enough, no discontinuity between the design process and the 'post-implementation phase' could be noticed, perhaps due to the lack of a definite methodology. Anyway, what literature says to be the distinctive points between the *pre* and the *post* implementation moment, did not show up in DSF history. Indeed:

- There was not a remarkable shift of actors' tasks. On the contrary, technicians, managers and social workers kept working and relating each other in consistent continuity also after DSF implementation. Moreover, steering group's activity did not substantially change;
- Technicians remained the same and they did not 'dismantled designers clothes'.

I introduce this clarification just to support the evidence that it is not possible to account for DSF story through the lens of system's lifecycle. On the contrary, it is much more fruitful to look at the process of co-design as it unfolded over time.

Going back to the field, the period between 2005 and 2006 is the one in which the interactions between the Regional Department and the Districts developed the most. The steering group began to meet more frequently (twice per month) and focused on social care's terminology, care process time framing and the interventions' modalities.

The problem of timing revealed to be particularly crucial: the Regional management pushed for a mutual sharing on how to account for both clients persistence and mobility in and out the welfare system. They strive to sort out the differences between:

- *New clients*, and namely those who entered the system for the very first time and/or who (re)entered after a long period of vacancy (an intense debate rose upon the definition of what a 'long period' might be);
- *Re-taken in charge*, those picked-up briefly after last intervention's expiring;

[41] I will go back to this topic in chapter 7.1.

[42] "*Fatta in casa*"

- *Past-through clients*, those who have been registered in the system for two or more successive years, no matter whether they benefit of consequential interventions or not;
- *Dismissed clients*, those died or transferred out of municipality's jurisdiction.

This activity took practitioners up in a profound work of reflexivity on their ways of understanding and performing the assistance. Owed to the deep differences observed among diverse social workers practices, the evidences I collected from the field show this process to be far from concluded. In order to give the idea of what this process could have meant, just consider this quotation I took from a social workers' plenary[43]:

> "*…either Paper Social Folder and moreover the digital one, they both introduced and reinforced the idea of "care process closure", namely a moment in which I have to consider expired my professional relation with the client. This concept was totally unknown to me before.*"[44] (T/A)

Alongside time framings' definition, the steering group also focused on professional terminology. This topic embraced both the issue of 'which terms to deploy to refer to something specific' and 'how to translate the whole range of Social Assistance's and Welfare's interventions into DSF forms'.

A first order of problems rose as the Regional Department imposed to distinguish between the 'care' (Personal Care Plan, see Ch. 6.1) and the 'counselling' translating them into two different DSF forms. This decision was due to the clear aim of regional management at considering the citizen a client "*just once the welfare system provide him/her with a specific intervention* [clarifying that, N/A] *social workers often misunderstand the meaning of DSF. It is not something to control their activity, neither to account for it*"[45] (Brunhilde, Regional manager in charge, T/A). Hence, the regional manager herself told me that this distinction represented a substantial problem for social workers once DSF entered their work practices.

Let me go through these terms and make this distinction explicit: the Regional management conceived 'care' every continuative process that can be accounted in terms of both bureaucratic procedures and funding. On the contrary, all those immaterial interventions such as counselling, support, colloquia and so on, have to be accounted in terms of on-the-spot interventions, out of

[43] The name of the speaking person is missing.

[44] "*Tanto la CSC, ma soprattutto la CSI hanno introdotto e rafforzato l'idea di 'fine del rapporto di assistenza', nel quale io devo considerare finita la mia relazione con l'utente. Era un concetto per totalmente alieno, prima.*"

[45] "*Solo una volta che il sistema gli fornisce una prestazione*" / "*le assistenti sociali fanno spesso confusione. Non è infatti qualcosa che controlla il loro lavoro, ma neanche per renderlo visibile*"

structured care plans' domain. Such a distinction is for social workers simply unconceivable. Indeed, clients problems just rarely have a short-time solution in practice. Counselling is not a self-concluded on-the-spot intervention but better a way through which they perform the care process. Owed to that, they simply missed the concept and addressed what the Regional Management meant with 'counselling' in terms of 'information providing'. The translation of this 'misunderstanding' into DSF had more complex implications. From the 'technical' point of view, recording each and every colloquia as a single activity is considered by social workers a lost of time. If they judge their relation with the client can reasonably have a follow up, they simply wait to open a DSF care plan until the situation takes shape. If it is not the case, it does not pertain their work and therefore they do not record anything. However, this common practice has also a professional implication that has to deal with the problem of power relations. Indeed, the punctual recording of every colloquia they have is seen by most of social workers as an attempt of the Regional Department at taking control over their doing. The more activities they record, the more they work. Decisively opposite to this idea, social workers rather preferred to account for their job in terms of hours spent on their cases. This would account for their workload without entering the contents of the care process, which is something absolutely intimate and private. Hence, they resisted to do as Regional Department wanted them to do because they saw it as an illegitimate interference with their work[46].

Aside from this, problems of different kinds occurred once the group faced PSF classifications' review. As an outsider, DSF programmer put the problem in these terms:

> "*…you have to consider that there are different philosophies in conceiving social workers practice. They all have their own way to think about it and to act accordingly. Differently from the healthcare, there are no standard protocols, no scientific handbooks on how to relate with complex and uncertain problems. That of course influenced data quality.* […] *It is not like saying "I caught a cold, I go to the doctor, I explain him the symptoms, he gives me a drug… ". in such a case it's easy: problem – solution – did it work? Yes or not. Linear, isn't it? How do you possibly apply this linearity to family problems, child abandonment, alcohol addiction, violence?..."*[47]
> (Hans, T/A)

[46] This problem of counselling recordings never found a solution. Social workers ignored those items so to lead Regional Department to clear them from the forthcoming version of DSF. Interestingly, PSF never took into account the distinction between care and counselling.

[47] "*devi tener conto che hanno diverse concezioni e filosofie della loro professione. Hanno tutte una loro idea e si comportano di conseguenza. Non è come nella sanità che c'è un protocollo, un manuale scientifico che ti dice come comportarti di fronte a certe situazioni problematiche. Sì, non è come dire 'HO la tosse, vado dal medico, mi dà la*

Hence, no surprise if this process took a long time to be considered partially closed. True, fieldwork told it is not even nowadays, but the point is that after animated debates it was the Regional Department to be charged with taking a decision. Sometimes it happened, more often they simply left things as they were, so that social workers representatives often felt frustrated by the impossibility to come up with a solution (for further information see Ch. 7.1).

Considered that DSF implementation ought to be tied to other Local Area Plans' projects and that time was rapidly passing by, the steering group decided to solve the complexity of classifications by taking into account just a 'minimum set' of indicators. These latter (the so-called 'red fields') had to be compulsory filled by social workers. That represented a compromise between Regional department reporting needs and the workability of the tool.

Thus, that frantic work of confrontation contributed to shape system's contents. In order to support DSF implementation, two other important artefacts 'saw the light': a methodological and a technical handbook. The latter simply explains DSF functions and it answers to FAQs. The first one is the attempt to put on paper how to enter each single intervention into the system and to state the *standard rules* underneath the records. I will have the opportunity to show how (much) it has been – and continues to be – worked around in the daily practices (see Ch. 7.2).

The Regional manager in charge underlined that, despite the established implementation's deadline, at the end of 2006 "*DSF use by social workers was absolutely negligible*"[48] (Brunhilde, T/A). From here, the decision to hold a specific funding to data entering. They thus bind DSF use to an economic reward. Moreover, Regional Department decided to postpone the deadline for the complete fulfilment from the end of 2006 to March 2007. This postponement became a rule for the years ahead: Districts have three months to set data in tune. At the end of 2007, this goal was achieved just by fifteen on nineteen Districts.

2008-2010: MAINTENANCE AND FURTHER DEVELOPMENTS

During 2008, all Districts managed to be in tune with regional dispositions, as to say they not only entered data about their clients in charge but also about both their past and dismissed ones. In the meanwhile, the steering group continued to meet, informing regional staff with suggestions about future implementations, social workers' doubts, difficulties, bemoans and even the resistances that DSF was facing in the workplaces.

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medicina'…in quel caso è semplice: problema – soluzione, funziona? Sì o no. Lineare no?ma come fai ad applicare sta cosa a problemi familiari, minori in stato d'abbandono, alcolismo, violenze"

[48] "*l'uso della CSI era assolutamente insufficiente*".

At the same time, practitioners began to interact with the software house support employee (Jasper), giving rise to an interesting texture of exchanges. At the very beginning they simply claimed for bugs fixing: the infrastructure went often down and DSF web pages usually loaded very slowly, sometimes data got lost or practitioners experienced data allotments failures (so that they could see other District's client profiles, for instance). By the time, a sort of familiarity and intimacy started to rise between social workers and the technical support, so that they started to ask him also some methodological questions. True, he always avoided as far as he could to get into this Regional Management's duty. Nonetheless, he sometimes provided suggestions and advices on the basis of how other practitioners were doing in other territories, how Regional Department wanted things to be done, and even suggesting shortcuts or workarounds. In doing so, he actually contributed to spread shared ways of data entering and coping with standardized procedures. Little by little he entered social workers' world, trying to understand their difficulties and apprehensions, how they thought the work had to be done, and mediating between organisational needs and ordinary life (see Ch. 7.3).

Fall 2008 and 2009 cover the period of DSF 'consolidation'. Borrowing Regional Manager's words: "*in 2008 the task was just to close the expired interventions and cleaning up dismissed clients. From that moment onwards, it has been just a matter of maintenance*"[49] (Brunhilde, T/A). Thus, the steering group stopped to meet and Regional Department staff, along with programmers and consultants, concentrated on DSF review in order to keep it updated and as much tuned with territorial requirements as possible. That did not mean that Districts remained still and silent, since exchanges kept on running mainly between social workers and the support programmers. Local managers and the regional level usually communicated whenever Regional manager asked them to validate data on specific implemented projects (see Ch. 7.4).

The maintenance evoked by the Regional manager thus assumed different faces: it not only unfolded through data checking process and support activity, but also within Districts, where I could observe multiple attempts of making classifications work. I will delve into this topic in Chapter 7.3.

Along with this maintenance process, the Regional Department worked on a new DSF version and gave light to an additional tool linked to DSF: I will call it MSAD (from the Italian acronym), and it is an add-on for homecare services management. They also tried to implement a module to record all the economic benefits lavished on clients and to link them to DSF care profile.

[49] "*nel 2008 il compito era rimasto quello di chiudere gli interventi obsolete e cancellare gli utenti non più in carico. Da qui in poi, solo un lavoro di manutenzione, insomma*"

Unfortunately, "*organisational differences represented an insurmountable problem. Indeed, each District had its own idea of what has to be registered. Whereas a lack of standardisation rises, it's impossible to identify a standard criteria, so we had to give up the project*"[50] (Brunhilde, T/A). This module's release has thus been postponed to the new digital folder implementation. At that time, Regional department would ask some Districts to test it before applying it to the whole territory.

The latest news concern local policy making: since Districts claimed for a tool which could help them in knowing what was going on in their areas, the Regional Department released a web-based application called Business Object Web Intelligence (further on BOWI), with which each District could create their own reports. This software has been presented in 2008 during a two-days training course. By implementing this tool, the Regional managers thought District to become autonomous in their reporting activity. In practice, people delegated to query the system often missed the expertise to do it by themselves. Indeed, to use BOWI implies to have at least a basic knowledge of Boolean algebra, and for this reason it ended up to be anything but a simple an handily device for practitioners (also because they had no time for retraining). Hence, they could just make do with the mechanical repetition of acquainted routines. Yet, being reports just rarely required, most of DSF administrators could not keep in mind how to use it[51]. Thus a common solution became to ask the support programmer to do the report on District's behalf.

The most recent developments shown that DSF system kind of felt into crisis: in 2009 the Regional Department presented the 'New DSF' to Districts. From that moment, the implementation has been always deferred. From what I heard in the field, it has been due to the renewed political administration's goals, aimed at achieving an higher integration of the welfare system with the Health domain. In doing so, they decided to start from the very information systems, reversing the logics of the 'New DSF' design upside down. For this reason, DSF project has not been adequately refunded, so that support programmer has been shuffled off, leaving both social workers and BOWI administrators alone with their troubles. Once acknowledged that, regional management tried to cope with that by:

- Surveying which reports Districts needed the most and inserting into a BOWI's ready-made set of queries;

[50] "*Le differenze organizzative rappresentano un problema insormontabile. Ogni Ambito ha infatti una sua idea di ciò che debba essere registrato. Laddove emerga una mancanza di standardizzazione, è impossibile individuare criteri condivisi, per cui abbiamo dovuto abbandonare il progetto*"

[51] True, somewhere BOWI has actually entered managers practice and it is skilfully used. Yet, BOWI's use is generally problematic.

- Setting up a support call-centre, which was hold by people who did not know both DSF and welfare system, though. What social workers could do was just to indicate the problem and waiting for someone else to call them back or directly solve the problem. True, I could notice how much this decision annoyed (and even scared) social workers: they used to a confrontation with the former support programmer who already dived into their practices. Opposite to that, they had then to relate with someone who "*doesn't even know what a care plan is. She's there just to answer the phone!*"[52] (Eleonore, social worker, T/A)

Leaving the field in fall 2010, my feeling was that things were left to go as they were, although everybody was waiting for some clear decisions from the Regional Department. As long as I know, 2011 passed without significant news. According to a recent phone call I had with Pierre (PN District DSF administrator), 2012 should be the 'New DSF' release's year. However, at the time of writing, nothing has been done about it, yet. True, the attempt of integrating Welfare and Health information systems is not proceeding as well, so that things remain still unclear and to say where DSF project is heading is hard to predict.

[52] "*non sa neanche cosa sia un PAI. Quella è lì solo per rispondere al telefono!*"

5. RESEARCH METHODOLOGY

To look at maintenance from daily practices' point of view means to avoid structural analysis and turn the attention toward the situated*ness* of the phenomenon. Thus, grasping such an ongoing process suggested to apply a micro sociological approach and qualitative techniques.

Hence, what I did is a case study (Stake, 1995) of the reality described in the former chapter (Ch. 4). More specifically, the application of ethnographic techniques shone immediately to be the more adequate according to the epistemology and to find an answer to the research questions. As Hirsheim and Chen (2004) pointed out reviewing Information Systems studies in the decade 1991-2001, that heterogeneous community of scholars is more and more looking at anthropology and ethnometodology's toolboxes for an in-depth understanding of systems-related phenomena (especially in the European context). Crucial studies on situated action (Suchman, 1987) and technology-in-use (Orlikowski, 2000) led a relevant part of the Information Systems community to bring ethnographic techniques into their analytical frames (Johnston, 2001).

Such a combination of epistemology and methods has been extensively deployed in the field of design, even though they are also increasingly applied in studying the broader context of Information Systems in use (e.g. Avgerou & Ciborra, 2004). Yet, such a translation has not been uniform, nor always rigorous. The application of qualitative techniques has been variously declined in terms of 'quick and dirty ethnography', 'evaluative ethnography', and so on (Hughes & Al., 1994; Fele, 2009). What seems to be constant in such a multifaceted bunch of studies is the centrality of contextual practices (Johnston, *ibidem*) and the analysis of situated ways of doing, opposite (or, better, complementary) to the mainstream attention towards plans and strategies.

The application of ethnographic techniques, and participant observation in particular, has thus been a direct consequence of the theoretical and epistemological standpoints presented in the first part of this work (see Ch. 3). Indeed, just these methods can help to grasp in detail the complexity of the contexts along with the daily practices that cross them, the tacit knowledge mobilized in them and the hidden strategies of action (Fele, *ibidem*). So to say, the distinction between the prescribed ways of doing and the actual ones (Bruni & Gherardi, 2007), which is the dichotomy one may easily find in Information Systems' literature (see Ch. 1.2).

Anyway, 'to participate' in daily activity seemed immediately to be insufficient with reference to the understanding of a distributed Information Systems implemented in 19 different territories

and used at diverse institutional levels. Then, where should the observation be made? And moreover, what to observe in specific? Questions as such led the way from the very beginning of the research path. Not satisfied enough, I was searching for something which could have helped me to treat the phenomenon as a whole, something like what Stake called 'collective case study' (1995). I found a way out of this *empasse* in a particular branch of ethnography elaborated in the middle nineties. That is what Marcus labelled 'Multi-sited ethnography' (MSE) (Marcus, 1995; Hine, 2007), also known as 'Ethnography on the move' (Wittel, 2000). Differently from the 'traditional' ethnography, this methodology does not aim at reconstructing an in-depth cultural understanding of a space and time-bounded community, but better to catch what moves from a site to an other, the processes which entail their connections and the shared ways of doing and sense-making.

According to the author who first presented such brand new label (precisely Marcus), MSE could be performed in various ways, and namely by following a) *people*, so to say practitioners, apprentices, peripheral participants, novels; b) *things*, which in my context meant DSF and all the other objects gravitating around it or substituted it; c) *metaphors*; *plots, stories and allegories*; d) *biographies* and e) *conflicts* (Marcus, 1995).

It could be that MSE follows either one or more of those elements. According to my experience, it is rather difficult to choose just one of those and consistently follow it all the research long without being pushed to contaminate it with the overlapping emerging trajectories in the field. On the opposite, it is much more the case to keep more of them combined. In my case, for example, being DSF the manifested commonality among all the settings (not the only one, though, but the one I was sure it was at the beginning of the experience), I choose to apply what Bruni called 'Shadowing technology' or 'Ethnography of non-human' (2005), that mean to observe "*an s-object* [by] *looking at the relations of which it is part, the contexts in which it is located, the practices that construct it socially, and the other s-objects*[53] *that cross its trajectory*" (2005: 362). However, to look at technology in action naturally encompasses looking at the people who use or non-use it, to search for it in the narratives, metaphors, and stories which made it present even if not physically visible, to reflect on the agreements and contrasts in its design and maintenance, how it entered the different practices and contribute to shape them in their common history.

[53] The author himself explains the s-object in relation with the agency: 'Being-an-actor', recognizing intentionality in action, and being identified as the 'origin' of an occurrence, is not an essence or something that people acquire once and for all (Law, 1994; Latour, 1999); on the contrary, it is a transitive (and transitory) property, ever contingent and precarious, which is located in certain s-objects more by collective action than by individual will.

Then, an important issue naturally comes at stake, and namely how to shape the boundaries of the research. As Marcus himself pointed out (*ibidem*), to design a MSE has to deal with constructing the fieldwork according to a set of defined options. With reference to that, he stated that "*the traditional 'how to' methodological questions of social sciences seem to be thoroughly embedded in or merged with the political-ethical discourse of self-identification developed by the ethnographer in multi-sited research* […] *it is* [an] *activism quite specific and circumstantial to the conditions of doing multi-sited research*" (*ibidem*: 113). Such a committed ethnographer is called by the author 'circumstantial activist'; this activism recalls an outstanding topic in contemporary social science: the reflexive process of acknowledging how we, as researchers, construct the reality we are looking at, in a so effective way that it becomes difficult to imagine a field-out-there. As John Law argued in his book 'After method', to reflect on how we explore, and even construct the world we are living, mostly relies upon "*whether we are able and willing to recognize that our methods also craft realities*" (Law, 2004: 153).

A central point in performing my research thus rested upon a continuous movement of the reflexive comparison between how I was constructing the boundaries and if and how those boundaries appeared in practitioners' narratives. If not, I questioned the reason why and took this gap into account. In other words, the argument is that "*Method is not a set of procedures for reporting on a given reality. Rather it is performative.* […] *The consequence is that method is not, and could never be, innocent or purely technical. Instead, it makes things different. The issue becomes how to make things different, and what to make.*" (Law, 2004: 143).

Aside from this fundamental stance of reflexivity, there are at least two other premises about method that underpin the research. Once again I go by Law's book as he talked about *multiplicity* and historicity (Law, *ibidem*). The first topic has to deal with the acknowledgement that there is not a single realty to catch (particularly central in the study of a distributed Information Systems), but different practices which craft, shape and enact different realities. Hence we have to cope with such 'fractionality' and therefore to care about reconstructing the partial and even unstable connections among these enactments. Since reality is continuously reshaped by the assemblages of people and things which get in relation, there is much more to be grasped of what we are looking at by taking into account the histories that are enacted, as well as the chronology of the arrangements. As Suchman argued (2007), how things got arranged in time is generative, meaning that there is something productive in the unfolding of multiple encounters.

Hence, once I had to decide where I would have spent my observation's period, I needed to take into account some fundamental information.

First of all, I had to deal with my personal history: before applying for my Ph.D., I used to be employed in a District office, and my activity partially related with DSF. That posed me an improved issue of reflexivity. Indeed, despite the aim at acting as a *stranger* (Schutz, 1944), I was aware that once in the field such a commitment is a resource that tends to run out fast in sociological ethnography (Schwartz & Jacobs, 1979). Once acknowledged that, I awaited an in-depth interview on my past experience to point out what I already knew about the topic (and the settings, too)[54]. Hereafter, I decided to avoid Pordenone (PN) District – the place where I worked – due to the fear I had to take too many things for granted. True, I entered PN District a couple of times, but just to follow a specific workgroup who did not exist at the time I was working there. After ruling out PN, I thus assumed all the other eighteen District to be equally interesting to me. After a feasibility study and some consultations with my colleagues and supervisors, I ended up with the decision to spent two weeks in every setting I would have entered, and that meant to take into consideration just four or five Districts. Which of them, it was not decided at that time.

Even if the research is far from being an example of *grounded theory* (Glaser & Strauss, 1967), in this phase I borrowed the *theoretical sampling* technique. I did not follow an 'orthodox path', but, as Mason wrote (1996), "*many qualitative researchers use the theoretical sampling without necessarily following the precise techniques advocated by Strauss. In its more general form,* [it] *means selecting groups or categories to study on the basis of their relevance to your research questions, your theoretical position and analytical framework, your analytical practices and most importantly the argument of explanation you are developing*" (Mason, 1996, p. 124).

Therefore, I started with an explorative documentary followed by six preliminary in-depth interviews to key-actors. I then decided where to spend the observation period informed by the outcomes of these activities. For the interviews, I applied the 'semi-structured interview' technique (e.g. Schmidt & Zimmerman, 2004), which allowed me to start from a very general question and let the subjects to expand it freely while seeing them closer to my research interests. In that preparatory activity I heard (in chronological order):

- Hans, the professional designer who designed the first DSF version (Access-based), followed the steering group for DSF classifications building, and supported practitioners at the early stages of the implementation;
- Brunhilde, the Regional Welfare Information System's manager in charge who led DSF design and still manages DSF implementation;

[54] I want to thank Francesco Miele from Trento University for his support.

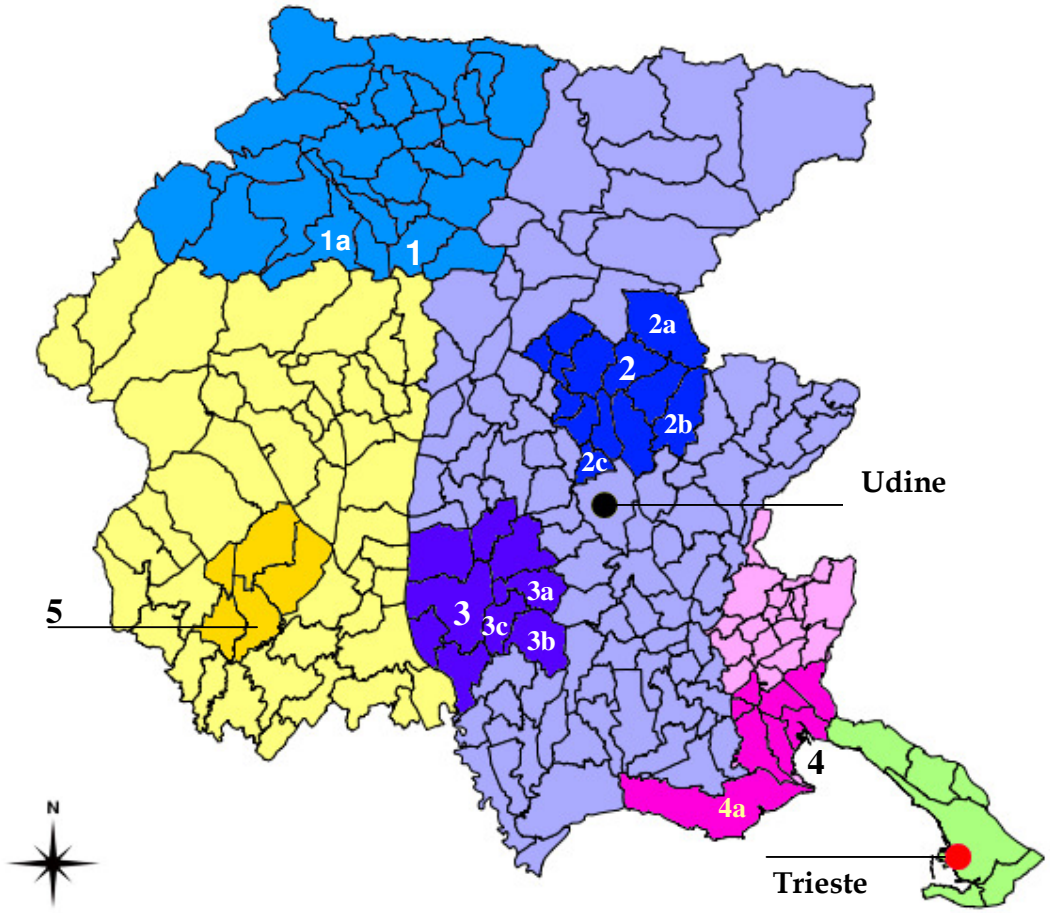
- Ophelie, District manager and former member of PSF design group. She just partially participated to DSF design meetings;
- Jasper, the former DSF programmers, charged by the IT support until may 2010. He participated to DSF design group and worked within Regional Department offices;
- Pierre: DSF and BOWI's District administrator, he used to work very close to Jasper and Regional Department in BOWI's query implementation. Institutional needs led him to do an in-depth work on DSF classifications;
- Mathilde, District manager. She participated to both PSF and DSF design groups. By the years, she brought into her workplace several innovation such as different Healthcare Assistance management software and tele-assistance.

From these interviews I hence opted for four Districts: Tolmezzo (TOL), Tarcento (TAR), Monfalcone (MON) and Codroipo (CDR). In picture 5 I show the location of these contexts within FVG Region. The first setting (Tolmezzo - TOL) shone to be particularly interesting from organisational reasons. Indeed, there the welfare providing system's organisation is delegated to the Health Department, instead of to a municipalities assembly. Moreover, the welfare department offices are hosted in the Health District's building, so that it has been easy for me to see the enhanced relations among different professionals. Aside from that, TOL District covers a very wide portion of the regional highlands. From the social work organisation's point of view, it has an impact on commuting, time framing and care giving. In addition to that, social workers' turnover is there more then elsewhere elevated and I was interested to see whether and how it influenced DSF implementation. Finally, an other interesting specificity concerned social distress' typology: elderliness, loneliness and alcohol abuse ratios (all of them over the regional average), combined with the remarkable territorial dispersion, let me think to have some kind of impact of DSF use[55].

From an other point of view, Tarcento (TAR) was of particular interest to me because of the scheduled MSAD implementation. Indeed, I had partially followed the same process in PN and I noticed some changes it gave the way to. Once negotiated the access, I also knew they were taking the occasion to completely reframe social workers' organisation, by migrating to a tripartite area system: instead of working on specific territories, social workers were going to be organised according to clients-problems' grouping, and namely a) minor and childcare; b) adults, handicap and family problems, c) elderly people and homecare. The two aspect combined let me appreciate the changes in some of their core practices, whilst to observe MSAD implementation's preparatory work revealed to be a kind of compendium of technological practices.

[55] For instance, elderly people in retirement house usually do not require a constant DSF update.

Picture 5: Research settings (FVG Region)



LEGEND

Province of Udine

- 1 District of Tolmezzo (TOL)
  - 1a Ampezzo
- 2 District of Tarcento (TAR)
  - 2a Lusevera (LUS)
  - 2b Nimis (NIM)
  - 2c Reana del Rojale (REA)
- 3 District of Codroipo (CDR)
  - 3a Mortegliano (MOR)
  - 3b Castions di Strada (CAS)
  - 3c Bertiolo del Friuli (BER)
- Udine
  Provincial Welfare observatory base

Province of Gorizia

- 4 District of Monfalcone (MON)
  - 4a Grado (GR)

Province of Pordenone

- 4 District of Pordenone (PN)

Province of Trieste

- Trieste
  Welfare Regional Department base

Totally different reasons led me to choose Codroipo (CDR) as third setting: it was the only District which completely outsourced welfare providing to a firm. Whilst District's Management was charged by policy making activity and social workers' coordination, the homecare services, goods and personnel wages were managed and provided by the firm. Perhaps because of that, CDR decided to implement an other management software (Insoft). According to practitioners, it considerately helped them in organizing their activities, the funding and projects. Insoft ran parallel to DSF but it did not communicate with it. Curiously enough, it did not imply an overload for practitioners, nor a bother, but maybe a required complement to DSF database. The aim at participating in CDR activity thus focused on looking at the relations between the two software and at the practices which mobilized them.

Concerning MON, the main reason for me to go there was the presence of SSP[56] Access file. SSP is a set of welfare project's accountability files in use it was ten years. It has been analyzed by DSF developers, although the outcomes revealed to be sensibly different. Opposite to Insoft application, which has been developed by an external software house with practitioners support, SSP is a kind of home-made system, rather flexible and designed for supporting local work practices. Once again, I was interested in reconstructing the connections among this parallel tool and DSF, well aware that it would have let several peculiar practices to rise. About clients-related issues, MON counts a huge number of disabled people, far more than the other District's average. That, along with the relevant presence of migrants (one of the biggest Italian shipyards is based there), represented an interesting peculiarity that might have influenced technology at work, somehow. Moreover, being at the Slovenian borders, MON had often dealt with cross-borders workers problems, influencing the labour market, elderly care, childcare and migrations policies.

Aside from these four settings, I also tried to negotiate the access to an other District which seemed to me particularly proactive in relation with digital records' implementation. Unfortunately they rejected my proposal due to work overload.

In addition to the eight-week participant observation, I also had the opportunity to follow two different workgroups: the first one in PN District where management charged three social workers (coming from three different municipalities) with the task of reviewing DSF classifications' system in light of their configuration in use (see Chapter 7.2). The other one was set up by Udine (UD)'s Provincial Welfare Observatory and aimed at keeping the provincial Districts' representatives

[56] SSP is the name given by MON employees and stands for Professional Social Work. I will not translate it, since it is merely a label.

together to build an annual report on specific welfare interventions. For each of these, I followed two meetings.

After the exploratory interviews, Tolmezzo (TOL) was the first place I entered. It was May 2010. Being the very first time for me to do an ethnography, I decided to follow DSF administrator first, and then to move from office to office trying to follow the 'technological paths' that I could have noticed. I tried to transcribe everything at the first stance, no matter whether openly addressing the research topic or not. I used to follow practitioners all the day long: six hours for three days and eight hours for the other two. In the free time, I immediately started to transcribe data and go back to them. It helped me to realize that my strategy was just partially good: indeed, the purpose of 'following technology' failed in front of the evidence that technology was absent for the major part of the day, even of the week. So, from that moment on, I decided to change my strategy and tried to: a) follow the narratives about DSF, data and PSF, so to say DSF presence in absence (Latour, 1987); b) follow social workers while they were working on data (no matter on which media); c) stimulate the reflection by doing brief interviews; d) follow the other objects that shown to have to deal with DSF and the information flow. In this territory more then elsewhere, I had to 'make DSF visible', since it was at all. The peculiarity of the research design (two week in each place) forced me to hurry up and collect the more data I could, no matter if they were naturally rising or 'forced'. Since I was not allowed to assist to clients' colloquia, I stepped from an office to an other according to social workers availability. It shone to be a good solution for two reasons: first of all social workers never use DSF during colloquia, neither they care about data; secondarily, they revealed to be much more well disposed with me during the rest of their working time just because (someone said to me) I took respect to their privacy. During TOL experience I also commuted to one of the four Health territorial Point that they have settled in the valleys that constitute the territory. There, I could grasp the worth of DSF implementation and the limits of paper-based data collections (see Ch. 7.5). The last two days have been rather different from what became the research routine. Indeed, I followed a social worker who taught DSF use to an apprentice; during the training I barely opened my mouth, recording each and every single explanation. Additionally, thanks to the contextual analysis I was carrying on, I could spent my last day of presence in interviewing specific actors about some elements that were yet unclear to me.

Starting from the methodological standpoints reported here above, I realized how much I was learning not only with respect to 'how to do the research', neither solely about the research topic, but on the two elements combined: as long as I collected data and reflexively went back to them, it

automatically became more and more clear to me on what to focus and how to catch it. From the lessons learned during TOL experience, I then moved to Tarcento (TAR) District.

There the situation was rather different, so that I had to question the activism I performed in TOL. There, it was the case of MSAD implementation to lead the way. The option of following DSF administrator revealed here to be the most fruitful. As a matter of fact, she acted as the gate away of most data-related processes, showing an unexpected commitment toward DSF, MSAD and data management in general. Hence I spent three eight-hours days in a row sitting behind her desk and shadowing her wherever she went and whatever she did. In doing so I could 'isolate' the most interesting practices gravitating around and across technologies and individuate the main information flows among District's key-actors. Then I followed the practitioners for the rest of the time. In between, I interviewed the three 'Area Managers', middle-range profiles between policy makers and social workers.

Much more aware of what to look at, following DSF administrator became a tenet in every place I entered afterwards[57].

It is precisely what I did in Codroipo (CDR). For three days I shadowed DSF administrator within District offices. I 'used' it to keep in touch with Insoft administrator too, so that what happened was that I slightly shifted from shadowing the first to both of them. In doing so I could catch the complexity of both social and the administrative work, looking at them from the point of view of the two information systems: where did they overlap, where they did not, whether and how they directly communicate and how they make people communicate, which implications did they have on social work practices and welfare organisation, and so on. I then spent the second week in the territorial offices, shadowing three social workers in their daily activity so that I could complete the frame of relations that I already caught from one point of view with the one of the other 'nodes'.

I developed the ethnography in Monfalcone (MON) more or less in the same way. Since DSF administrator was also charged with managing the internal database (SSP), it has been like following two people at once, but it implied to question field notes very deeply in order not to misinterpret what was happening. Thus, I had to deal with a particular assemblage of administrator-DSF-SSP at work, so that I had to search for clarifications about DSF in use from other components of the organisation. Once in the territorial offices (second week), I had the impression that DSF was much more left apart from the daily practices as elsewhere. However, I soon realized it was just

[57] The reason for this technique to break down in TOL is mainly due to the fact that the administration of information was carried on by DSF administrator together with District manager. To follow the latter revealed to be much better for my purposes, since the first one was also charged with clients care (thing that did not occurred anywhere else I have been).

differently enacted according to the internal procedures: DSF was 'bent', 'stretched' and creatively misused. Therefore I concentrate on such a peculiar way of assembling it with the other workpractices and artefacts.

Finally, I also had the opportunity to follow a training course set up by the Regional Department to explain BOWI's functions and routines to DSF administrators. Insiel[58] Programmers taught them what was new about the software at the presence of both the Regional manager in charge and the consultants. In that situation I acted as a follower, focusing on class topics and the interactions that rose during the day.

In the following table I provide a summary of the contexts I entered and the peculiarity of the research developments.

Table 5: Research settings and main research activities

Settings	Activities
Tolmezzo	- Preliminary interview with District manager - Two weeks of participant observation - Followed practitioner in AMP office - 'Made technology rise'
Tarcento	- Preliminary meeting with social workers - Followed DSF/BOWI administrator - Two weeks of participant observation - Followed practitioners in LUS, NIM, REA offices
Codroipo	- Followed DSF administrator - Followed Insoft system administrator - Two week of participant observation - Followed Insoft developer-Administrator meeting - Participate to homecare assistant training day - Followed practitioners in MOR, BER and CAS offices
Monfalcone	- Preliminary meetings with social workers - Two weeks of participant observation - Followed DSF/SSP/BOWI administrator - Followed practitioners in MON and GR offices
Pordenone	- Preliminary Interview with District manager (PSF and DSF design steering group member) - Preliminary interview with DSF/BOWI administrator - Participate to two meetings of DSF classification rework working group
Udine	- Participate to two Provincial Welfare Observatory meetings (object: data gathering for annual reports)
Trieste	- Preliminary interview with WRD ISSS manager in charge - Preliminary interview with District support personnel - Participate to BOWI training day
Portogruaro	- Preliminary interview with DSF designer who – at the early stages – was charged by software development and District support

[58] I recall here that Insiel is the name of the Regional Department's software house.

A final remark on field work activity has now to be explicated, and it has to deal with the privacy statement's issues rising during the participant observation. Indeed, I tried to do the best I could to avoid any interference with social workers' privacy concerns: I never entered a colloquium, nor I recorded clients given names, I always asked practitioner to talk in general terms if it was the case to enter personal details (I always feared it could have risked to compromise data), and I did not collect any dataset reporting clients distresses.

As I had the opportunity to remark, to set up, organize and carry on such a qualitative research implied the impossibility to distinctively talk about data analysis without considering it deeply tied with the reflexive process of data gathering. The theoretical aspects, the practicalities of the research and the fields' outcomes are so deeply interrelated each other that it is better to think about data collection and analysis as a circular movement (Gobo, 2001). Anyway, the decision to perform a MSE clearly implied some analytical choices. To me, one of the most troubling point in MSE is whether to consider it an ethnography better than a research informed with 'ethnographic sensibility' (Star, 1999). As Christine Hine pointed out (2007), the relation between MSE and traditional ethnography is somehow ambiguous. Anyway, from the first time the term was coined (Marcus, 1995), MSE has been declined also in terms of 'analytical hints': to say that what it matters are connections, relations and process clearly suggests to concentrate on specific elements which make multiple contexts a singular research object. As standpoints of the analysis, I took into account:

a. the reconstruction of DSF maintenance-related process as they rose from different territories;
b. the continuous movement of comparison between specificities, commonalities and differences observed in the settings;
c. the comparison between how things emerged from the narratives and from the observation of the practices;
d. the critical reconstruction of singularity by questioning my own narrative in light of practitioners orders of justification (Suchman, 2003).

PART THREE

EMPIRICAL FINDINGS AND ANALYSIS

* * *

> *"No studies focus on how organisations actually achieve alignment (though clearly there are some organisations that attempt this) nor, indeed, whether alignment is the right way of looking at the issue.* […]
> *This discussion has shown that there is a clear need for further research into alignment, especially the practicalities of its achievement"*
> (Avison & Al., 2004: 226, 230)

After the discussion of the theoretical standpoints of the research and the methodological pattern followed to collect and analyze data, in this chapter I will enter the workplaces and describe how things went on.

In chapter 4 I described the institutional and legal framework of the Italian welfare system evolution, along with the specificity of Friuli Venezia–Giulia regional context. I concentrated on DSF design history, broadening the unclear borders of what is traditionally conceived as 'design' to step back to PSF experience and to go beyond system's implementation.

From such a premise, the reader will now enter four different Districts and follow DSF as it has shown to be mobilized in the diverse working activities. Since in reconstructing the design process I missed to take into account some software elements, I will start from 'decomposing' DSF and cut it into small pieces, so to fully describe its constitutive parts and how they relate each other.

Afterwards, I will follow it into a typical social workers working day, pointing out some elements of its situated enactment along with the relation it contributed to shape. What will rise is a complex web of intertwined elements which got variously assembled together in work tasks performance.

By following technology and its relations let some streams of activity to rise as central in the practical unfolding of maintenance-in-use. I will thus start from the account of the steering group activity. I recall that this group designed (and designed-in-use) DSF classifications in between the fall design phase and the early stage of implementation. I will show how processes thought to be disconnected had on the contrary a reiterate negotiation basis. Further on, I will face what could be defined as one of the most central elements of keeping systems in tune with organisational

practices, and namely the daily classifications workout (and workaround). I will then proceed from the situated unfolding of those activities up to support programmer's work, not just to underline the importance of technical skills to make the system run, but better to show how he became a gateway for the translation of multiple languages into the singularity of the system. In the fifth section I will focus on how the problem of keeping database's consistency had been acquired through data checking activity. To keep it update did not show up to be the only consequence of the reflexive process it continuously sustained. Finally, I will dedicate a section to the material environment, in order to acknowledge the complexity of sociomaterial arrangements observed, and to account for their fundamental role in relation with DSF affordances and maintenance.

At the end of the chapter I will finally look at field data combined. Such a comparative reading will allow me to point out some tenets of maintenance-in-use as they rose from the worplaces.

6. LOOKING AT AND THROUGH THE DIGITAL SOCIAL FOLDER

Before focusing on how the system got mobilized and maintained in everyday use, in this chapter I will in-depth analyze Digital Social Folder (DSF). I will first of all deconstruct it to catch the implications of a system implemented in distributed environments; I end up with the acknowledgement of a system multiple, differently and contemporaneously enacted in space-time. Then I will put it into motion in a welfare department through the assemblage of diverse empirical evidences drawn together in a pretended social workers typical day.

6.1. DIGITAL SOCIAL FOLDER: EXPLORING THE SYSTEM MULTIPLE

After the reconstruction of DSF design process (see Ch. 4.3) and before showing how is maintained-in-use (Ch. 6.2), let me here introduce it to the reader.

To me, this presentation is twofold important: firstly because it gives the reader a coherent introductive presentation of the tool, secondarily because it will be useful to understand the tension between the singularity and the multiplicity of the system.

Interestingly enough, I noticed practitioners address DSF usually at singular, so that the narratives mainly concern *the* DSF, as if it was a monolith entity. As Mol pointed out talking of bodies and arteriosclerosis, practitioners themselves tends to maintain the consistency of the object of their practice by addressing it as a whole, so that '*a single disease that in practice appears to be more than one* [is presented, N/A] *without being fragmented into many. Thus a body may be multiple without shifting into pluralism*' (2002, p. 151). My argument here (similar to Mol's one) is that if we shift from the domain of the narratives and take into account the daily accomplishment of DSF work, we make the multiplicity of the system to rise. The consistency carried on by the widespread narratives of a single system thus breaks down when sift through a practice lens.

However, before diving into this topic it is better the case to introduce DSF, its structure and the main functions it has. As the developer of the system presented it, DSF is a '*simple centrally-*

managed web application that runs on both internet and the regional intranet'[59] (Hans, T/A). Hence, I argue two different paths can be followed: from the web application we can follow data surfing the cable infrastructure; they are encrypted to preserve privacy from external interferences both from the regional welfare system outside and within District domain (none can see others data, excepting from Welfare Regional Department (WRD) and programmers). In most cases, their journey is everything but smooth: somewhere they have to pass through municipal servers[60]; somewhere else the broadband is not broad enough to carry all the information flow; sometimes the combination of the two along with multiple simultaneous log-ins overload the system, lowering its capability to transmit data, and so on. Whatever the case, their walk comes to an end in the regional *datamart*, a "huge bowl" - as technicians like to call it - where specific algorithms check data consistency and re-organize it in the most suitable fashion for the reporting activity. Otherwise, in the opposite direction, we can look inside the application and analyze its structure. As shown in the history of the tool (see Chapter 4.3), there has been a migration from an Access-based[61] system to the web, which just partially changed DSF structure. What I am going to do here is thus to step down the structural hierarchy of the folder. It will be quite like opening a Chinese box, with the substantial difference that each box contains more than one smaller pack.

At the highest level we have social workers personal account, the box that contains everything underneath it. Being 'personal', we might count more or less 300 active accounts and several expired ones 'owned' by retired social workers.

Inside we would find a sundry number of clients folder (those are what social workers call 'social folders'). Each and every client has here its own place, being the client already in charge or not. Looking inside a randomly picked up one, we realize there are six different sub-boxes[62]:

1. **Clients Name and Surname**: it is the clients homepage, which summarize both active and expired clients PCPs (see point 5). Generally speaking, it resumes clients history within the welfare service.

[59] "*E' una semplice applicazione web centralizzata che gira su internet e sulla intranet regionale*"

[60] Regional technician indicated this infrastructural deficiency as the main cause for the slowdowns experienced by social workers.

[61] I recall that each District was provided with an Access file for data entering. They were either sent via email to the Regional Department or collected by programmers who commuted across the Region.

[62] I use here the literal translation from the Italian label.

2. **Registry**: clients personal data storage. Data can be entered manually or automatically, for the system can pick them up from the registry office database (at least wherever the system Ascot is implemented[63]). This page can be modified at any time.
3. **Clients reference people**: this section is dedicated to the network of people around the client. Here we would find either clients relatives and people who have important relations with the client (e.g. friends, neighbours, tutors, and so on). Once again, those fields could be partially filled through the automatic procedure described here above.
4. **Pick-up without Personal Care Plan (Non-PCP)**: to understand this section (and the next one) we have to refer to Law 328/2000 and LR 6/2006 (see also Ch. 4.1 and 4.2). They both distinguish between a 'light-care process' and the more narrowly defined as 'Pick-up Care', which requires an articulated Personal Care Plan (PCP) (see next point). The first one is conceived for all those clients who are not supposed to need a continuing help, but they benefit from some random and on-the-spot interventions of counselling. For such a category, DSF forms require information on the intervention (access date and cause(s)) and clients registry data, along with the professional diagnosis made by the operator who took the client in (light) charge. This section could list numerous 'Non-PCP' subfolders, as much as how many meetings the client had with the operator. As I had the occasion to explain before, this category goes against the logics of applied social work because a client who enters and exits the service randomly it is barely conceivable. It does not mean such a client does not exist, but that to enter data about them simply does not worth the effort. That is the main reason for this section to have been largely ignored[64], and it will be most likely left apart in the upcoming DSF release.
5. **Personal Care Plan (PCP)**: Designers based the structure of this section on the former Paper Social Folder with the aim at providing operators with a complete scheme on which to plan and monitor care interventions. PCP contains five subsections:
   a. *Profile*: here social workers can enter client personal data (e.g. social distress, age class, instruction level, civil status, family unit, number of children, ...), financial situation data (ISEE[65], work condition, job placement, class of monthly income, …) and health situation data (handicap, functional diagnosis, …);

[63] Ascot is the main registry office information system used in FVG. Just few municipalities use an other one called Alley, which does not 'communicate' with DSF, causing conceivable work overloads.

[64] Later on this section we will se how this passage is worked around in practice.

[65] ISEE stands for Indicator of Equivalent Economic Situation, and it is used to indicate the financial situation of Italian families.

b. *Diagnosis and goals*: social workers have to individuate clients prevalent problem and state the main goals they intend to reach through the care process. However, most of welfare service clients are multi-problematic, so that it is straining to choose among a drop-down menu options. A blank field underneath in which to integrate the pre-made classification often does not represent a satisfactory option;
c. *Interventions*: probably the most used form, here social workers store data about the interventions they set to face clients problem(s). Despite both clients profile and diagnosis are unique, Multiple interventions could be stored. This section is structured in four main areas: c1) Administrative acts data (reference number, date, description); c2) Typology and detailed classes of intervention, to be both chosen from a drop-down menu; c3) Times and chronology (starting date, expiring date, frequency and so on); c4) Financial covering[66]. Later on this chapter we will come back to this central section, analyzing more in depth its implications in daily practices.
d. *Integration to interventions*: specifically designed for minors recordings, it allows to modify an ongoing intervention accordingly with client's status change.
e. *Dismiss PCP*: this page is a sort of summary of the interventions and the care process. Herein social workers enter the reasons why they filed the PCP along with some integrative notes. The concept of 'coming to and end' in care relation somehow baffled operators, who were used to think about care as a kind of open-ended process, although discontinuous over time.

6. **Expired PCPs**: in this folder social workers can find the history of their client by browsing former care plans.
7. **Diary**: here a blank form allows to store notes on clients care history. In PSF it constituted the more intimate space in which operators filed personal reflections and all sort of information not perfectly fitting standards. Shifting into digital, it changed both in the meaning and in the ways it is used (see chapter 4.3).

In picture 6 I visually reconstruct DSF folders and subfolders structure.

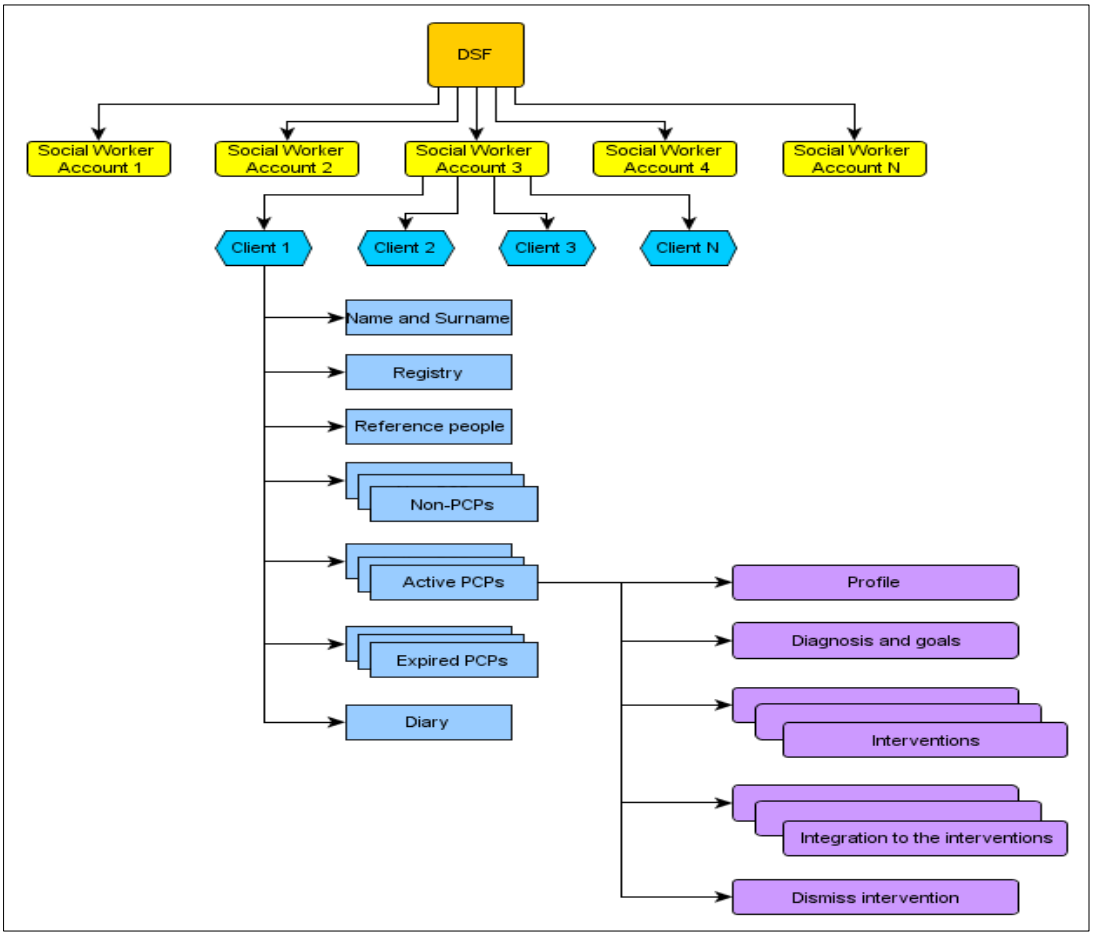
At this point, I have thus stepped down the hierarchical organisation of DSF, but I still have to dig into it to reach its smallest constitutive elements. Rather than being subordinated to a specific subfolder, those elements cross the whole range of pages. I am of course talking about the content

[66] True, this section is not filled very often, because it does not allow to record monthly costs. To trace it, social workers usually prefer to work in collaboration with the administrative in charge. This evidence led Welfare Regional Department to think about a DSF dedicate add-on, which nonetheless has not been implemented, yet.

of the forms, what fills them. They can be either numbers or strings, dates or blank spaces, but, at the end, they are mainly *classifications*.

A classification is literally a time, space and time-space segmentation of the world, which has to rely on a unique principle and be constituted by mutually exclusive and exhaustive categories (Bowker & Star, 1999).

Picture 6: DSF structure



Source: FVG Region, Health and Welfare Central Department, *DSF user's manual*, author's rework

I will work this concept out more accurately in the next section, concentrating in particular on how DSF classifications born. Now, I would rather focus on the description and analysis of those classifications and their 'options', the categories. Being them thousands, it does not worth an accurate scanning, but I think a cross-sectional reflection would better fit.

First of all we can distinguish between *general* and *professional* classifications and categories. To the first group belong all those classifications such as clients profession, instruction level, civil status, etc., but also operator's ones and the lists of health and welfare institutions involved in the care projects. To the latter belong the classifications that refer to the diagnosis and interventions. As

said, within the first group (diagnosis), social workers have to choose just one option among 18 different categories, which often creates problems of exhaustiveness in accounting for clients multifaceted problem. Taking a closer look to the list, we might easily realize categories are not mutually-exclusive at all. Just to give an example, one can suffer either of 'longstanding unemployment' *and* 'poverty', which are indeed usually correlated. Thus, the logic here is rather that of *prevalence*.

Things get even more complicated in the second group (interventions). Here we have a two-level classification: a more general one called 'macro-intervention' which enrols 'big families' such as homecare, financial, professional and work interventions (8 categories), and a narrower one called 'micro intervention' (108 types), which specifies within each single macro family all the punctual activities that can be possibly implemented. In this case the problem of mutually-exclusiveness falls apart, in the sense that the number of categories covers a larger range; they are much more exhaustive and punctual *and* the visibility of multifaceted aspects of care is kept safe by the possibility to open more than one intervention for a single diagnosis. Nonetheless, the strive for exhaustiveness led here to fragment social workers activities into an extremely high number of classes, whose translation into the system materialized complexity into oversupply. The argument here is that abundance preserves exhaustiveness whilst creates problems of workability. Indeed, the more classification gets narrow and specific, the more the theoretical principle of subdivision (*fundamentum divisionis*) does not fit with the practical conceptions and understanding of it, leaving space for interpretation. By the way, there is an other aspect of abundance which has to be cited: the possibility to choose among *all* options means to have a number of categories which can not be deployed everywhere because they refer to some services that are peculiar of few District only. 'Vocational guidance services' for instance, do not belong to welfare system's task; nonetheless, a couple of District decided to settle a dedicated office, and therefore this category entered DSF classifications.

A second order of grouping distinguishes classifications according to the object they refer to. I could hence identify a) client-based classifications; b) work-on-client ones and c) project-based ones. To the first group mainly belong clients data, which largely cover what we called 'general' classifications group – all those characteristics not depending on clients relation with welfare system. Into the second group I put all those data which more specifically refer to the actual or planned work on client, such as diagnosis and interventions typologies, social workers notes, diary, contacts and institutions involved in the care process. All of those are specifications of care project like time framing, funding, administrative data, and so on.

Those two grouping could be summarized in the table here below, in which I provide some examples.

Table 6: Main DSF classifications groups

	GENERAL	PROFESSIONAL
CLIENT-BASED	Clients Personal data (age, sex, job, instruction, …).	Clients problems;
WORK ON CLIENTS	Institutions involved in the care process.	Diagnosis; Interventions; Goals.
PROJECT-BASED	Administrative data; Funding.	Time framing; Evaluation

Step by step I then cut DSF into smaller pieces. From the more general container till the more minute component, we stepped down and through assemblages of different kinds, each of them intrinsically related – more or less tightly – with the others. Relationality is indeed the preminent criteria underneath selective processes of choice. DSF works according to some rational steps of selection as far as the practitioner steps into data entering processes. This means *not all options are always possible*. The system itself poses some constraints that relate with practitioners through the interface. To talk about it thus means to shift to the latter let us move from the theoretical dimension of categories closer to the dimension of practical activities.

Opposite to system 'business rules', the interface is the 'locus' practitioners inhabit in their daily life (Knorr-Cetina & Brugger, 2002). If we take a more constructivist point of view, we might first of all outline how the structure given to the interface constrains both social workers work on DSF and professional practice. In other words, the idea of 'how a client should be taken in charge' by a typical operator and 'which steps care process should make', are both embedded into DSF and shape work through the interface – what it does allow to do and what it does not. To oblige to individuate an expiring date for each and every intervention is a typical example of how DSF forces social workers against the professional logics of care as an open-ended process *by the mean of the interface*. That crashes with the vagueness of a pretended healing of the client, either. The managerial idea of interventions as "*what welfare system provides to the individual*"[67] (Brunhilde, T/A), namely funding aids, homecare services, meetings and so on, meets - through the interface - the professional idea of intervention as care. Moreover, through the interface social workers have to translate their real clients into a 'digital client', so to say to simplify complexity and make it fit into system stiffness.

[67] "*Ciò che il servizio offre all'individuo*"

Anyway, the opposite face of the coin is that through the interface is possible to workaround and creatively enact technology and its parts. Practitioners can browse the application, jumping back and forth, stepping some passages away, complete the structured parts by writing on the blank spaces, and so on. Affordances and constraints embedded in the interface are thus just one of the aspects which compose the possibility for action inherent in the wider relational frame in which human and machine interact. I will avoid to consider technology at work as a one-way issue of data entering or system's workability. On the contrary, I rather want to focus on the relations which are enacted in practice in complex webs of human, machine and other material elements.

I have entitled this section "the system multiple"; through the argumentation I pointed out how the system is complexly articulated, and I analyzed the parts it is composed of. Anyway, we do not have to confuse the presence of numerous elements and the abundance of classifications as 'multiplicity'. At the same time, the simultaneous implementation in 19 Districts it is not sufficient to address the topic, too. In this case we rather talk of DSF as a 'distributed application'. To recognize that DSF is not a monolith but composed by different parts, and to underline the potential implication of ubiquitous implementation, are both fundamental starting points. However, the multiplicity of the system relies on its simultaneous, differentiated and partial *enactment* in practice, That individuates specific and rather stable sociomaterial assemblages (Suchman, *ibidem*). In other words, the point is not solely to acknowledge plurality but to look at system parts within specific settings and social groups: which parts are tied together in practice? how the human-machine encounter shapes? To which consequences does it lead? Questions as such are fundamental to catch multiplicity. Although the further argumentation aim at deeply exploring this topic, let me here provide the reader with a simple example: DSF gives the possibility to print a resume of clients folder (registry data, diagnosis, number and typology of interventions). In many District such an option is simply neglected because it provides the same information social worker may find in PSF. However, some of them kept on using it when they move, so to have an essential card index always at hand without bringing PSFs with them. Even more interesting, in TOL it became an official document for external communications: social workers avoid to let anybody look their PSF because they usually store personal statements, impressions and feelings about clients care process, they decided to send DSF printing over. Indeed, it has got all the basic information condensed into a 'sterile' document. In TOL, it is mainly deployed to answer both juvenile and criminal court requests. It seems quite clear that it is not just a matter of 'creative enactment' but the definition of specific technology-work configurations that overcomes the borders of use. The same object earns

citizenship in different ways and under different meaning according to the practice which mobilizes it. That is the reason why the system is multiple.

Therefore, to account for maintenance starting from those basis means to explore different enactments and assemblages and how they are performed in practice, which elements have been partially stabilized, which are worked out, what is centrally taken into account and what is left apart. My argument is then that those enactments are the way through which a *plural* and *distributed* system is kept alive in a multiple way, by multiple actors. The challenge is then to individuate which role different actors play in maintaining specific parts of the system and how the multiplicity gets consistent.

6.2. DIGITAL SOCIAL FOLDER AT WORK IN A WELFARE DEPARTMENT

I closed the former paragraph with the statement of the system multiple, so to say, a system that is composed by different parts and crossed by lots classifications that get variously enacted in practice. Hence, the theoretical standpoints suggest to look at technology-in-use (Orlikowski, 2000) to understand maintenance phenomenon. Indeed, from an epistemological point of view, I skipped away from the conception of maintenance as a technical activity narrowly positioned in time, to conceive it as a process enrooted in the daily workout of technology. In this paragraph I will then reconstruct what could be defined as virtues and vices of DSF in relation to practitioners daily life.

What is going to be done here is to accurately reconstruct a social worker's typical day. In doing so, I need to fantasize: first of all I keep an hypothetical practitioner[68], who is the assemblage of different social workers experiences[69], drawn together into the singularity of a day; moreover, I put this assemblage in relation with a various number of professionals and clients, which most likely do not all cross operators activity of a single day. Then, I pretend this social worker to be occupied in DSF related activities all day long, hypothesis that materializes just few times per years, mostly in the immediate vicinity of DSF updating deadlines. Finally, the reader has to keep in mind the multiplicity of the system: the whole paragraph is the assemble of different arrangements observed in diverse settings, which I draw back into singularity for argumentation consistency purpose.

[68] For commodity purposes, I pretend this practitioner to be a woman – to use neutral pronouns and adjectives would have made the text weighty to read –. Yet, the choice is also justified by the evidence that the larger majority of social workers are actually women (in my fieldwork I encountered just 4 male among tens and tens of women).

[69] Therefore, the quotations in this paragraph, they will all refer to social workers speeches, so that I will simply cite their fantasy name. In case of quoting someone else, I will specify her/his role.

The reader will also find the researcher interacting with practitioners. I deliberately choose to make myself visible in order to fully address how the reported evidences actually came about.

Now, I am ready to start.

It's pretty early in the morning, the researcher enters the municipal welfare department building and is received in social worker office.

8.30

She just arrived; once in her office, she turns the PC on and, in the meanwhile, checks what is scheduled for today. There are no clients colloquia: today is dedicated to DSF, she says.

I – what are you going to do?

SW – well, I have few folders with interventions to enter, then I don't remember whether there are others to be renewed, so I will check out what DSF tells me about it. There are also some ASF interventions to enter, but that's a long story…we wait till the procedure is validated, then we enter the interventions[70]. (Mirta, T/A)

Once the system runs, she opens DSF web-page and enters her username and password. Data load very slowly, "*as usual*" – she says. While waiting for DSF to be ready, she stands up and picks up a bunch of PSF from the filing cabinet in front of her desk. Just a blink to the screen: DSF is still working. Hence she picks up the phone and makes a couple of brief calls. She writes down some notes on sticky papers, then she puts them in two of the PSF she brought.

DSF loaded the homepage, she searches for the first client's folder she has to work on. She does a research by name. Once clicked on the family name capital letter, DSF starts to recover information and loads the page. There is still a little bit to wait.

SW – that's a bad thing about DSF: it's usually very slow in loading data…I understand the situation whatsoever, but it's impossible to use it on real-time.[71] (Mirta, T/A)

[70] "*Ecco, ho alcune cartelle con interventi da inserire, ma non ricordo se ce ne siano altri da prorogare, quindi vedo cosa mi dice la CSI. Ci sarebbero anche i FAP da inserire, ma è una lunga storia…di solito aspettiamo che la domanda sia operativa, poi inseriamo l'intervento*"

[71] "*Ecco una cosa brutta della CSI, è sempre lenta a caricare…io capisco tutto, ma così non la si può usare in tempo reale.*"

Since DSF is still working I take the occasion to ask her about the relations between DSF and PSF. Indeed, I realized PSF to be much more central in social workers practice, and that DSF data entering is usually achieved taking data from PSF. I was then curious about how practitioners see the combination of the two:

> *SW – Well, I use PSF much more than DSF, of course. It is much more handy and it gives you a totally different sensation, I mean, you can touch it! We use it a lot and it is very subjectively organised, apart from the cover, which contains clients general data. Me, for example, I have my notes, colloquia and phone calls registrations* [she means notes here, N/A]*, something I write down during area meetings* […] *then there're documents like decrees, court relations, communication from the cooperative who undertook some services on contract, and so on. DSF has some blank spaces but no one uses them, with people you can only trust paper! PSF is hence much more used, it is handy, if we have to move in a colleague's office, we bring it with us and we have all we need.*[72] (Vanna, T/A)

One of the most relevant characteristic that distinguished PSF from DSF is hence that the first is much more personal, intimate, and that there social workers feel 'safe' to store everything concerning client. Although some blank spaces have been designed into DSF, according to her, no one use them (I will show this assertion to be false, though). From this very first impression it seemed PSF to be kind of complementary to DSF and definitively much more in tune with social workers practicalities. In between the lines, also PSF revealed to be anything but monolithic: documents, relations, notes, all those elements make PSF plural at least as much as DSF.

9.00

DSF loaded the selected page and the social worker is now ready to begin data entering process, PSF opened wide in front of the keyboard. First of all she has to update an intervention: the day before she had a meeting with a child she has in charge. She was not sure whether she registered the funding intervention or not. She explained to me that they were not used to open it because they just

[72] *"beh, quella la uso molto di più di quella elettronica, perché è più pratica e ti dà una sensazione diversa, la tocchi! La utilizziamo molto ed è organizzata in modo molto soggettivo, perché a parte la copertina, che ha le informazioni generali… per dirti io ho la mia parte di appunti, la parte di registrazione dove metto i colloqui e le varie telefonate, gli appunti che mi prendo durante le equipe. Poi c'è la parte della documentazione, in cui raccogliamo tutte i decreti e le relazioni che inviamo in tribunale, la parte delle schede che ci vengono inviate dalla cooperativa che ha l'appalto. La CSI ha qualche spazio in cui scrivere, ma con le persone ti puoi solo fidare della carta! Sì, la CSC è più usata, ad esempio, se ho un colloquio con un collega in un altro ufficio, porto la CSC è ho tutto quello che mi serve."*

took for granted that, in case of child fostering, there would be some kind of supply for the family who housed the minor. Then they (the social workers belonging to childcare area) realized they ought to do it as a praxis, so they kept entering those types of interventions for each and every minor recorded into their DSF. Surprisingly for her, she realized the record not to be inserted yet. Hence, she browsed PSF documents and found the intervention starting date, which was unfortunately too far in time for the system to accept it[73]. Although she acknowledges to be a methodologically wrong, she enters the more 'distant' date as possible. Then she justifies her doing with the evidence that it more or less corresponds to the time they acknowledged the problem. "*Anyway, it's not just me, we all have the same problem, so…*"[74] (Andrea, T/A).

Then she carries on with an other case. First of all, she has to check whether it is already updated or not. She explains me that DSF has a page that automatically shows up the expired intervention. However – she continues – it is useless in this case, because the problem is to record an additional intervention to an existing PCP. I ask her why she does not use DSF reporting tool to check it out. She explains me she has to step several passages to have it, then she has to export it in a spreadsheet and (of course, at this point N/A) print it out. Not the easiest and most practical thing to do, also in light of systems slowdowns. To avoid that, she made a personal list on paper. She picks it up from her desk drawer. It is a complete handwritten list of her clients, with a lot of multicoloured notes aside of each name. She tells me it is the better way for her to have an immediate and comprehensive picture of the situation. A little bit angry, she adds: "*With such a list, you may understand DSF is completely useless to me!!* "[75] (Andrea, T/A). Acting as the devil's advocate I provocatively question how could it be ever possible that DSF does not provide her anything she does not have already at hand. So I asked her: "Are you telling me that PSF, along with your paper notes, are just enough and the best you have to do your job?"

> *SW – no, no, I mean, with DSF you have a much more immediate list of the intervention you give to the client…PSF, it doesn't…I mean, I have them in mind and I have my list, but let's say not everybody has it, so DSF may help to remember the cases. And then the dates… if I need a date, DSF gives me much more easily, instead of browsing the cabinet, find client's PSF, looking inside it and so on. I have to say, registry data are*

[73] Since social workers are supposed to enter data timely, on March of every year programmers block the possibility to record new interventions starting before that date.

[74] "*In ogni caso non sono solo io, abbiamo tutti lo stesso problema, quindi…*"

[75] "*Capisci bene che con questa lista la CSI mi è completamente inutile* [in questo caso l'espressione sarebbe stata più colorita, si è preferito tradurla con 'inutile']*!!!*"

much more precise, too. Sometimes we don't write down everything, you know…Anyway, it also depends on how you use it…[76] (Vanna, T/A)

Such an ambiguous ending does not leave me satisfied, so I ask her to carry on an foster the argument. She keeps telling me a colleague's case who is actually taken as an example for the punctuality in data updating: Lucia (her colleague) has a lot of clients who do not need a constant attention – people in retirement house, for instance – and so it is pretty easy for her to simply forget about fixed deadlines, appointments that are usually scheduled each 6 or 10 months. Hence, she kept entering into DSF three month-lasting interventions also for those services that naturally expire in a year; at the same time she started to open DSF more often as usual and check the page that resumes all the intervention that are about to expire. In such a way she would never misses a monitor anymore and she haa a day-by-day control on her data. Despite the fact it is not an orthodox way to use DSF, she came up with a workaround that made the system a support for her activity.

Yet, she concludes that it is a pretty time consuming habit, so that it did not take roots among the other colleagues. However, she says that DSF has some other positive outcomes, for instance:

SW – it helps to focus on your work and what you work for. I mean, it helps you to synthesize. It kind of 'forces' you to deeply reflect on the expressions, taxonomies, interventions coding…something that, in an open registration you might write down in misused words…on the contrary, DSF, by compelling you to short codes, implies it is better for you to carefully think about how to make the situation to emerge. Consequently, you have to think about your work. (Vanna and Clara, T/A).

I – And how do you decide what's the 'correct' registration?

SW – It's not me, well understood. For the simplest things we've got the manual, of course. Then in case of persisting doubts we confront each other, usually in Area Equipe[77]*. There we share what's the best for us, I mean, we search for an agreement on how to enter data about similar cases.*[78] (Clara and Rosa, T/A)

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[76] "*No, no…la CSI ti dà uno spaccato più immediate delle prestazioni che dai all'utente, la CSC non te lo dà…Voglio dire, io ho perfettamente in testa l'elenco dei miei utenti, ma qualcuno non ce l'ha; in questo caso sì, la CSI può darti una mano a ricordarti i casi. Poi ci sono le date, se ho bisogno di una data, la CSI me la dà più velocemente, piuttosto che alzarsi, andare a cercare il fascicolo nell'armadio, eccetera. Devo anche ammettere che le anagrafiche sono molto più precise. Sai, non è che scriviamo sempre tutto…ma poi dipende da come la usi…*"

[77] Equipe i s how social workers call area meetings. To me, it gives the idea of a 'task force' specifically dedicated to area target (minors, adults, homecare and so on)

[78] *"Beh, aiuta a focalizzarti sul tuo lavoro e sul perchè lo fai. Diciamo che ti aiuta nella sintesi. Nel senso che forse ti spinge a pensare correttamente alle espressioni, alle diciture, alle codifiche degli interventi che magari in una*

Hence, once abstracted from their practicalities urgency, social workers kind of mitigate the uneasiness about DSF use and acknowledged its power of enhancing the reflexivity of their work. That does not always and necessary lead to a prescribed use of the tool (e.g. what manual says) but to find a common ground among a more or less wide social group.

While talking with me, she keeps filling DSF forms copying data from PSF; she stops just to answer two phone calls that interrupted us in the hour we past together. Ironically, she tells me that her work is always so fragmented that it is unconceivable for her to schedule DSF dedicated times, in which to exclusively record data. She knows that somewhere else social workers left half a day per week for such a task. In those moments, social workers are unavailable for anybody and they are just about working on DSF. She thinks this solution to be extremely unprofessional and even unethical, since their work should first of all be concerned with taking care about people, not about machines.

10.00

She share her agenda with me. In half an hour a plenary had been convened. Among the other topics, there would be a discussion about the forthcoming implementation of Homecare Assistance (HCA) software[79], something connected with DSF – she specifies – that will cause additional workload, for sure! She thinks it could be of extreme interest to me to assist, so that she already told District manager about my presence. "*Please, just leave the room when we will start to talk about cases. It's not you, but the privacy statements*"[80] (Charlotte – District manager, T/A).

She passes the remaining time in completing funding interventions recordings. Due to the fact that the official documents are all stored in different clients folders, she asks the administrative

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registrazione libera saresti portato ad usare impropriamente certi termini e mentre nella CSI, essendo obbligato ai codici devi pensare bene per far risaltare la situazione. Quindi ti costringe ad una riflessione più mirata sul tuo lavoro"

E come è che decidi quale la registrazione giusta?

Non è che lo decido io, è chiaro. Per le cose più semplice c'è il manuale, ovviamente. Poi se ci rimangono dubbi ci confrontiamo, di solito durante le equipe. Lì decidiamo cosa vada bene per noi, cioè cerchiamo di metterci d'accordo su come inserire i dati su casi simili"

[79] MSAD is the name of that software. It has been designed to pick up data from DSF, and more specifically from data about homecare assistance interventions. There social workers store, accordingly with clients needs, the type of intervention (meals and drugs delivery, housekeeping, personal hygiene support, and so on) and the frequency of homecare assistants access to clients domicile (how many times per week and for how long). With such an information, MSAD automatically schedules homecare assistants turn. Once the service gets provided, the operators record it into a mobile application's form which sends data to the mainframe, so that there is always a precise account of the whole service organisation.

[80] "*Basta che esci quando incominciamo a parlare dei casi. Non è che non mi fidi di te, ma sai, la privacy…*"

employee in charge to kindly provide her with a resuming list. She receives it via email, she prints it out and she keeps mechanically fill the forms.

10.30

We sit around the meeting room table. It is Cécile (DSF administrator) to first take the floor. From the report that Jasper (DSF District support programmer) sent her, they realized the update level to be far from achieved. She explains that, without *all* HCA data on fine, MSAD would not be able to plan anything. It is then crucial that social workers enter data as soon as possible. She acknowledges them to be very busy, and therefore she designed a spreadsheet based on DSF homecare data forms and she just forwarded it to everybody. Thanks to that, they can enter just the minimal information. They can also do it on paper and send it back to her – as they prefer. Once she gets them, she is going to enter data by her own, using social workers passwords to access each single account. Although it shines me a very generous effort from her side, different voices keep on rising: not everybody agrees to consider DSF a 'communal thing'; Cécile accepts the critique and says that everyone is free to choose how to enter data. She nonetheless counter argues that, in her opinion, it is of central importance for the District DSF to become a shared 'patrimony'. Anyway, the discussion immediately turns into whether or not to use MSAD, since it would imply additional work[81]. A little bit frustrated by the debate, Cécile takes the occasion of my presence to ask social workers their impressions about DSF, by round of the table. Here the most interesting ones:

- *DSF trivializes my work*
- *Without it, there would still remain PSF, so no worries about not using it.*
- *DSF diary page is not used also because there's no space enough for the relations.*
- *It's a kind of PSF double. It's not that bad, but it needs to run faster and smoother.*
- *During the morning, there's usually so much things to do that it barely occurs to DSF.*
- *I printed out DSF main page and I use it to take notes during colloquia, so that I have all the information I need at hand.*
- *It's very sad how they want to compute my work.*
- *DSF classifications are simply a violence.*
- *Although it remains very stiff, Regional Department has made something to meet us halfway.*

[81]True, it has been District management who asked MSAD to be implemented there, since it was not compulsory.

- *DSF has brought into my mind the concept of clients discharge.*[82] (Various social workers, T/A)

Listening to such a comment Cécile sometimes intervenes haranguing social workers to be anchored to an old view of their profession: to her, they are not used to organize their care processes. She keeps pushing on the need for monitoring and activity planning, especially in this moment in which funding is lowering and requests for accountability and transparency are increasing.

At this point the situation gets confused and the discussion disorganized and frantic. Two social workers from the Health department enter the room: It is time for me to exit the meeting and leave them to their cases.

The plenary lasts till lunch time, the social workers and me, we will go back to work thereafter.

14.00

Back to the office, she tries to access DSF. It seems to run very slowly, slower than usual. She tells me that Jasper provided them with an other URL, instead of what they are usually redirected to. Jasper's trick consists in 'sending' them through an other District dedicated line, probably the one in which is DSF used the less and therefore the broadband is not often overloaded. But today also the 'trick' seems to fail: DSF is not working. After some minutes of waiting, in which she makes a couple of phone calls and tights up some papers left on the desk, she decides to call Jasper. She confesses me that she rarely writes him emails. Indeed, she needs a live-support "*because the time you wait for the answer is lost. Emails are good just in case of non-urgent problems, for example when you digit something wrong that doesn't compromise the work you're about to do in the digital folder*"[83] (RG, T/A)

Since Jasper does not answer, she decides to close DSF page and to keep doing something else. She remembers about a relation for the court to complete.

[82] "*La CSI banalizza il mio lavoro/ se non ci fosse, ci sarebbe comunque il cartaceo, come adesso, quindi…/Il diario della CSI non è usato mai anche perché non ha spazio per le relazioni/ E' come un doppione della CSC. Non è malaccio, ma dovrebbe funzionare meglio e più veloce/ le mattine c'è così tanto da fare che a malapena ci pensi alla CSI/ mi sono fatta delle stampe della prima pagina della CSI. Le uso durante i colloqui così chiedo tutte le informazioni che mi servono/ trovo molto triste come vogliano contabilizzare il mio lavoro/ Le etichette della CSI sono una violenza/ sebbene rimanga un sistema blindato, bisogna dire che la regione ha fatto qualcosa per venirci incontro/ La CSI ha introdotto il concetto di dimissione dell'utente, che prima mi era alieno"*

[83] "*Perché il tempo che aspetti una risposta è perso.* […] *le e-mail vanno bene se il problema non è urgente, magari quando hai sbagliato a digitare qualcosa ma che comunque ti permette di andare avanti con ciò che stavi inserendo*"

14.30

I sit silent in a corner, observing the room while she is writing on PC. She often takes a look at PSF notes to complete the relation. She is going more and more times on it. She explains me that she is doing as such to come up with a satisfactory and precise document; once completed, she prints it out and makes for the printing room to collect it. From there she heads to an other office where the document will be protocoled and sent to the Court.

15.30

After three short phone calls, she restores DSF webpage. In the meanwhile, it returned to ran smoothly. She explains me that sometimes is not DSF to blame: Jasper once explained her that data have to pass from her PC into the municipal server and from there to the Regional Datamart; the same the all way back. Therefore, slowdowns may happen and it is hard to individuate where the problem occurs. She concludes by saying that in such case, the best thing to do is to wait and do something else.

Thinking about that, it seemed to me that DSF has often to do with postponements: no one among the social workers I followed used to wait DSF times. They better fill everything minute in between loading time or they simply put off recordings to an undefined future.

Then she stands up and retrieves three folders from the cabinet, she opens the first one, searches for the client in DSF archive but the recording is curiously missing. Being a recent case, she probably has not entered it yet. Heaving, she runs Alley[84] in an other window. Unfortunately for her – she bemoans – in her municipality they do not use AscotWeb, the one that automatically picks-up data and translate them into DSF. Although she has to manually copy each and every single voice into DSF, she thinks Alley to be much better in terms of information provided. What she is now doing is printing registry page and refer to it to insert data into DSF. She specifies that she could easily copy them from the very webpage, but she prefers to print it out so that it can also act as a useful summary to store into PSF. Then she starts to fill each single clients specifics required by DSF: she knows most of them by heart, she retrieves all the others from either PSF or relations notes.

Before beginning to modify other clients HCA interventions, she is interrupted by a phone call. It is a colleague of hers who calls from an other District. They keep talking about a client, so that I have to leave the room for a while.

[84] Alley is on of the two registry systems used in FVG territories, the other one is AscotWeb.

16.15

Called back in the office, she explains to me that her colleague called because she picked up a former client of hers and asked for some advices. She remembers to have had him in charge several months before, but then the intervention expired and the person never shown up again. Then she came to know that the client moved down south the region, and she had to give to her colleague some information to start the care process. She continues the explanation by pointing out that PSF never exits the District and therefore they usually set a meeting with the new social worker in charge to share basic information. That goes specifically for very problematic cases – she adds. For the less serious ones, a phone call it is enough, and it avoids to commute very and loose half a day of work.

SW – *I have to say, that's an other good thing about DSF. I don't know if you already know, but there's a button to automatically transfer client's DSF to an other operator* [she shown me how to do it live]. *I told you a phone call is usually enough, but with such a tool we can send a much more complete information about the person. Indeed, it is extremely useful, in our work, to know how many social workers clients had, which type and how many interventions they got, their family situation, and so on. Moreover, since we're reluctant to show how we take care about patients, there's a very low risk to transmit confidential information, because they have simply never been recorded there! However, this possibility offered by DSF is really useful, in spite of all the problems we face with it [laughing].*[85] (MC and CL, T/A)

Then she completes the procedure of DSF transfer and calls the colleague back to monitor if the procedure turned out well. Then she turns to me and says:

SW – *hm, but if I transfer clients DSF, it means I don't have it anymore, neither in the expired cases…so to say, did I ever had the client in charge for WRD? I hope DSF can keep trace about former client's passages within welfare system…* [86](Lisa, T/A)

[85] "*Devo ammettere che c'è un'altra cosa buona nella CSI. Non so se sai, ma c'è un bottone che ti permette di trasferire la cartella ad un altro operatore. Ti dicevo che di solito facciamo con una telefonata, ma con questo strumento possiamo mandare informazioni più complete sul caso. Sai, per noi è fondamentale sapere da quante assistenti sociali è stato seguito l'utente, che tipo di interventi ha ricevuto, per quanto tempo, la situazione familiare, eccetera. Poi ti dicevo che di solito non si mandano informazioni troppo specifiche sull'utente…beh, con questo strumento è impossibile perché non vengono inserite in CSI. In ogni caso, questa cosa è una cosa utile, a differenza di tutti i problemi che ci dà*"

[86] "*Però se trasferisco la cartella vuol dire che io non ce l'ho più…nemmeno il pregresso. Vuol dire che per la regione io non l'ho mai avuto in carico? Spero proprio che la CSI tenga conto dei vari passaggi dell'utente…*"

It is already five o'clock in the afternoon, the end of the working day. Before going back home, she switches off the PC, collects everything from the desk and locks PSFs cabinet. HCA interventions remains out-of-date till tomorrow and DSF dedicated day closes with a relative low amount of work done on it. However, I could notice how DSF can enter more or less every activity in which social workers get engaged.

This imagined social worker's typical working day is of course a stretch. I recombined fragments of different lives, combining events happened discontinuously in space and time. In doing so I forced reality for the research purposes, but it represents a consistent frame for the upcoming description and analysis.

To look at technology at work mainly dealt with how DSF entered and remained alive within social workers practice. On the one hand, to tell this story from just the operators point of view could seem partial to the most, but it could not be otherwise owing to the research goals; on the other hand (and from the opposite point of view), it is just through following technology at work in welfare Districts that it had been possible to reconstruct the relational texture weaved around, through, with and by DSF. In such a way, different practices came into stage, showing how they are deeply intertwined in daily life, and how different order of justification (Suchman, 2003) mutually shaped each other.

To take what reported here as a general narrative about DSF allows to make some orientation toward technology to rise. With this term (orientation), I do not simply mean how DSF is seen by practitioners, but the wider relational frame of technology at work, in which the analysis object it is not the one-way direction from the human to the machine, but the action as it unfolds within the frame of human-nonhumans interactions. In other words, starting from the narratives of a single person or of a social groups and combining them together with the observation of technology in use, I could draw a 'secondary level' frame of how things get together.

From here, an ambivalent orientation toward DSF could be noticed. Synthesizing for both commodity and clarity purposes, I could end up by saying that there would be some *good reasons to carry on with DSF* along with others *to give up DSF use*. That could be either put is terms of virtues and vices or positive and negative aspects of the technology, without forgetting that there is no black and white, and that technology could not been addressed in itself.

To say social workers narratives mainly dealt with sceptical concern about DSF is not a mystification. This problematic relation between (and within) DSF and their professionalism revealed to be a matter of standardisation and practicalities of the work. In other words, DSF

impacted on both the logics of action and the practical routines of Welfare Districts practices. Moreover, whereas standards open-up local environments to the broader regional welfare organisation, to look at professionalism let explode the complex enrolment of technology into the existing sociomaterial framework of minute work tasks.

Listening to most practitioners, it might seem that to keep working on DSF is just tied to the funding granted by Regional Department[87]: without WRD rewards there would be no maintenance. For those who pointed it out, regional money transfers represented an excuse to counterbalance the evident DSF lack of fit in addressing territorial needs. Indeed, DSF has not been design to be aligned with all the different 'structural' and practical configurations Districts may have. As Hans (DSF programmer), pointed out talking about an other software requested by a District in the PN area,

> "*To think that the system could possibly resolve internal organisational problems or naturally adapt to them, it's simply unconceivable. We have to have clearly in mind where we want to go, first, and then to strive for a mediation between system's structure and social workers work. They have to be flexible enough…I mean, machines, they can't adapt, they are precise!*"[88] (Hans, T/A)

I would argue, the problem does not solely concern the structural organisation of the different Districts, but it rather addresses the issue of standardisation in relation with how things get accomplished and performed in practice: DSF standardisation engaged with social workers times and languages. About times, it shaped the way in which things developed during the working day and it also required specific dedicated times around the week and/or the year. Moreover, it contributed to reframe how care-times were conceived and performed. It forced operators to fix a starting date, a monthly duration for each intervention and introduced the concept of dismissing clients, which was largely unknown among professionals. In addition to that, being classifications and standards frozen definitions which embed something whilst leaving something else apart (Bowker & Star, 1999), they introduced a new vocabulary for social workers to use, a dictionary which modified how clients were conceived and accounted for.

Anyway, DSF has not been the only attempt to homogenise welfare system's practices. Indeed, it entered an environment that was already populated by standards, the most important of those

[87] I remind the reader that Regional Department granted a fund to all the District that demonstrated to have data updated at the end of the year.

[88] "*Pensare che la macchina ti risolva i problemi organizzativi o che vi si adatti è impossibile. Bisogna avere prima chiaro in mente dove si vuole andare, poi magari cercare di mediare tra la struttura del sistema e le sociali. Dovrebbero essere più flessibili…le macchine non possono, sono precise.* "

was PSF. I can not say whether PSF experienced the same resistances and uneasiness of DSF, but sure practitioners take it as a standard to highlight DSF virtues and vices. In spite of the digital version, PSF seemed to be much more integrated in daily life. According to social workers narratives, it is not only because it was 'running' from a longer period of time, but mainly because PSF represents an operative support whilst DSF awaited a much more effective "*statistic turn*"[89] (Hans, T/A).

I can say, this distinction draws the connection between what it is seen as negative and what shown up to be worth in the tool. To be fair and more openly account for social workers practice, what is around DSF not only deals with the minute accomplishment of daily practicalities, but it embrace a much wider process of planning, programming and monitoring, both at a client and District levels. Well understood, such processes have 'always been there', but DSF actually contributed to reshape the frames in which they develop. Curiously, such an aspect of social work rarely emerged from operators, whilst it is very present in District Management's account. I argue, it did not show up in what social workers told mainly because they were too much deeply engaged into DSF daily implications to see it 'from the outside' of their daily work. No wonder then if the topic has been brought into stage by those people who worked cheek by jowl with social workers but discharged of clients care. It is what Francesca (TAR adult area referent) confided me. She used to be an operative social worker, then she became an area referent with no clients in charge. So she said:

> "*…the possibility of using DSF to have information raises hopes for future applications. Yet, honestly speaking when I started this job I was coming from a municipal department, so I am behind my colleagues. First of all, I don't have to enter DSFs anymore, I don't have deadlines, I don't have to mediate between clients and recordings, I have no pressure. That matters!*" [90] (Francesca, T/A)

DSF administrators, Area referents, support programmer and District managers (along with Regional Department and consultants, of course), they all let emerge the importance to have a tool that provides Welfare system with a picture 'taken from the top', granting a perspective of things combined.

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[89] "*Svolta in senso statistico*"

[90] "*...poter usare la CSI per estrarre dati mi fa ben sperare. Onestamente però, quando ho cominciato qui venivo dai Servizi comunali, ed è per questo che sono solidale con le colleghe. Innanzitutto non ho più da inserire cartelle, non ho scadenze, non devo mediare tra l'utenza e l'inserimento dati, non ho pressioni. Questo incide!*"

Most of the people met in the field talked about this in terms of *reflexivity*, namely through the extent that, thanks to such an information systems the whole welfare providing environment granted an informed and extensive perspective on social distress and how they were working to face it. They all acknowledged that it first of all implied a deep reflection on social workers ways of doing, how they conceived their own professionalism and the different practices they performed.

Connected to this last point – but risen as self-standing topic – there is also the issue of connections drawing: through its affordances, the enhanced transferability of information, the need of a wider confrontation, DSF contributed to redraw the connections:

- within Districts
- among Districts,
- among different professionals and their present organisation
- with the organisational outside, either institutional (Regional Department) and professional/practical (technicians and consultants).

In conclusion, I tried to reconstruct a typical social worker's day and show how technology is so deeply entangled (Orlikowski & Scott, 2005) in everyday life. At this point, the reader might question which is the relation of all that with maintenance. Once again, I agree it is difficult to individuate a direct and causal connection with what is conceived as maintenance in the common sense. However, I already shown how I see such a phenomenon, and I pointed out how it just rarely is a manifested organisational goal. Despite of this, the fundamental question is 'how could we avoid to take such evidences into account?', and moreover 'Can we understand the persistent presence of DSF without take into consideration everything around it?'.

In the next section I will thus concentrate on those questions and show how maintenance-in-use unfolded in the observed real-life.

7. HOW MAINTANANCE UNFOLDS IN PRACTICE

> "*… and then I hope a maintenance work would be fostered, either on technical functionalities, which is maybe easier to obtain, and on DSF contents. Indeed, such a tool, let's say, 'ages' very quickly* […] *for the reality we work on it's turbulent, and this turbulence requires constant adjustments*"[91]
> (Mathilde – District manager, T/A)

Questioning the strategic and self-concluded idea of keeping systems alive suggested to look at how this process gets variously accomplished throughout practicing technology in daily life.

The upcoming paragraphs are the description of how DSF is maintained both operational and central in multiple webs of activity which encompass different workpractices. Moreover, what I am going to account for by focusing on technology as one of the elements in those net of activities is not merely a technology implementation matter, but rather a broader process of keeping things together.

This attempt at drawing a situated account of how maintenance unfolds will be declined through the analysis of four main processes that rose from the field, each of them inherently intertwined one another. They represent a quite clear and recognized (by practitioners) way of organizing the work on DSF and its constituents and to draw – at the same time – a tight connection with the broader organisational contest. I will start from the description of DSF design steering group activity: on early stage, it carried on the task of harmonizing DSF with workpractice and professional visions; I will then shift to the multiple and ongoing process of daily classifications workout. That represents a reflexive moment in which various elements get constantly assembled and reassembled, standards get questioned and (partially) closed; further on, I will concentrate on the relations tied between territorial operators and technical support and I will finally come to data checking process, which I

[91] "*Eppoi spero che si continui un lavoro di manutenzione, sia tecnico – che magari è più semplice – sia sui contenuti della CSI. Difatti questi sono strumenti che invecchiano presto* […] *ma è perché è la nostra realtà che è turbolenta, e questa turbolenza richiede aggiustamenti costanti*"

see as a management-driven enactment of technology at work that enhances the mutual shaping of both people ways of doing and technology at work.

Although it will not be solely a thick description but a reasoned narrative of how things got done, it will open up for more in-depth reflections that I will further develop in dedicated sections.

7.1. GROUP WORKING

In chapter 4.3 I walked through the historical process who led to DSF implementation. This path started long time ago with the activity of an *ad hoc* working group which aimed at bringing homogeneity in social work practices. Its work materialized into Paper Social Folder (PSF) artefact, which later on would have been taken as a basis for designing an Access-based data collection system. This group is know among practitioners under the label of "First working group on social folder". After PSF implementation and the regional manager in charge retirement, the group disappeared.

Anyway, it is not the only experience of groupwork we find in regional welfare system history[92]. Indeed, the renewed technological affordances, along with Welfare Zone-Plans (ZP) start-up, enhanced the possibility and encouraged the institutional covering for translating PSF into a web-based application. With the aim at designing this tool, Regional Department kept together a new working group, which would have been later called "the Commission" (or "District Commission"). From 2004 to 2007, this Commission met every fifteen days and frantically worked on DSF structure and classifications.

Despite the fact that, at the time of writing, this group already cessed its activity, I think it is nonetheless interesting to concentrate on what it did, not only because it represents an attempt of (unaware) Participatory Design, but also because it survived the specific design phase. This central aspect of continuity between what is traditionally conceived as design and implementation as separate and self-standing moment in software development (e.g. Avison & Fitzgerald, 2000), is a

[92] The argument here refers specifically to DSF design and implementation process. There would be much more to say about the relevance of group working in social work practices and, more generally, in the contest of welfare system. Although there is nothing in my possession which supports this hypothesis, I could draw a connection between the commitment toward group sharing activity on DSF and the co-working habit inherent to the broader environment of care and social policy making.

concrete example of how borders often blur, and it could be therefore defined as an attempt of Participatory Design-in-use[93] (Dittrich & Al., 2002).

According to the theoretical frame and the epistemological standpoints I assumed, it is crucial to rest on this process. Indeed, it represented, for a concluded lapse of time, a concrete way in which things have been kept together, and both the coherence and consistency of the system-in-use have been maintained. Such an acknowledgement will also open up for broader reflection on participation, users and system implementation. I am going to develop these topics in Chapter 9.

Differently from PSF working group – which was composed by six social workers, the Regional manager in charge and a technician who acted as analyst and developer – this new group enrolled different profiles. Indeed, it was composed by:

- The Regional Information System on Social Services (ISSS) manager in charge;
- Two consultants;
- Three Insiel[94] employees: an analyst, the District supporter and DSF programmer;
- A variable number of District managers (from five to seven) along with local welfare departments representatives, being them social workers or administrative personnel.

No matter how much people entered the group, the narratives of both the Regional manager and District personnel let emerge two main subgroups: on the one hand, there was the regional level which counted Regional management, consultants; on the other, the variegated constellation of District representatives, which were supposed to carry on local needs and goals and to speak on their behalf.

Although hierarchically submitted to Regional Department, programmers are left slightly aside this dichotomy due to their rather singular position. Here is how Hans, DSF developer, described the activity within the workgroup[95]:

> *At the beginning the idea was to create a tool for supporting social workers everyday life activity. At the same time, we wanted a learning tool which educate them to standardized data entry. Anyway, the Commission had to face a problem we did not took into account: Friuli Venezia-Giulia (FVG) hasn't got medium-sized municipalities, so*

[93] This definition is theoretically imposed, since no clear methodology has been used and none referred to the groupwork in such terms.

[94] Insiel is the Regional Department 's software house.

[95] The quotation I propose here is purposefully draw together from the recording of the long interview SB submitted to me. Since we came back more than once on different topics, I picked up and tied just the sentences that were coherent one another.

that District Managers representing several small entities pushed for a work-supporting device, whilst the others were much more interested in a managerial information system. These latter were thus much more aware of the necessity of dropping some operational claims and negotiate with Regional Department.

[…] methodological aspects were consultants tasks; they tried to have a merely data-gathering approach, denying the practical concerns…therefore, it was us who tried to negotiate between data management and workability. Indeed, if social workers don't see a benefit in all this, they won't use the system.

[…] we met once per month, and every time social workers representatives scolded us! At the beginning it was for bugs, but immediately later for the methodological criteria of data entering. Unfortunately, at that time we [Insiel personnel, N/A] *weren't charged of it no more… you know, consultants came and thought we were just the brawn, they were the brain…so when we received methodological claims, we had to forward them to Regional Department. At the end, we were there to make sure that District didn't ask for something detached from technological affordances.*

[…] By the way, I have to acknowledge that Regional Department strived a lot for keeping District together along some shared lines of doing…which could also been changed in case they didn't work for them. [96](T/A)

[96] *All'inizio l'idea era quella di creare uno strumento che supportasse l'attività quotidiana delle assistenti sociali. Allo stesso tempo, volevamo che fosse uno strumento che le educasse a inserire il dato con criteri condivisi. Ad ogni modo, la Commissione ha dovuto affrontare un problema che non avevamo considerato: la regione non ha comuni medi, solo piccoli o grandi. Quindi le direttrici degli Ambiti con tanti piccoli comuni spingevano per un sistema che supportasse l'attività, mentre gli altri tendevano di più per uno strumento manageriale. Questi erano quindi consapevoli che bisognasse cedere su qualcosa e negoziare con la regione.*

Gli aspetti metodologici li curava la società di consulenza, che però ha cercato di avere un approccio di pura raccolta dati, tralasciando gli aspetti pratici…perciò eravamo noi a dover negoziare tra un dato per la programmazione e l'operatività. Cioè, se le sociali non ci perdono tempo se non ci vedono un beneficio nel sistema.

All'inizio ci incontravamo una volta al mese, e ogni volta ci facevano neri! All'inizio per problemi tecnici, ma subito dopo sui criteri di inserimento. Purtroppo a quel punto non era più nostro compito…sai, i consulenti sono arrivati e hanno pensato che noi fossimo solo il loro braccio armato…quindi ogni volta che ci arrivavamo richieste le giravamo immediatamente alla regione. Alla fine noi andavamo lì per assicurarci che gli Ambiti non facessero richieste avulse dalle possibilità tecnologiche.

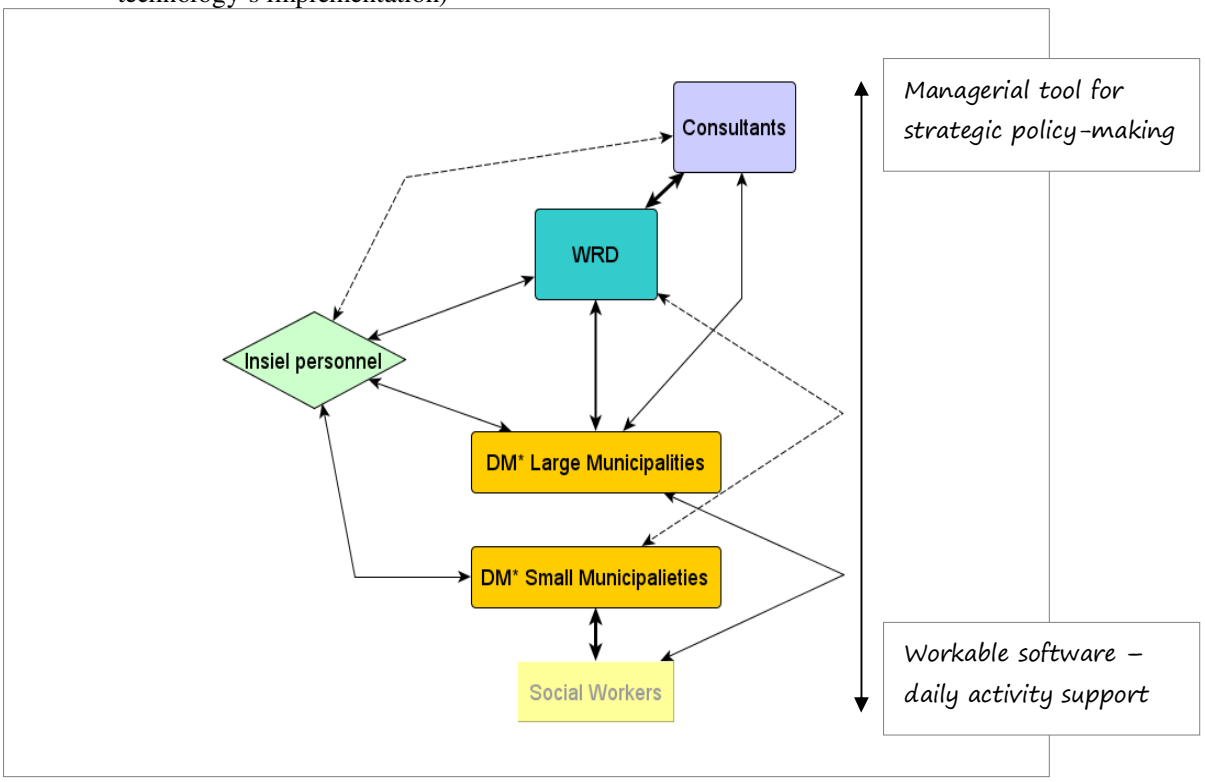
In ogni caso, devo ammettere che la regione si è data davvero da fare per omogeneizzare le modalità…che tra l'altro potevano anche essere cambiate se l'avessero chiesto.

According to this description, the reconstruction of grouping within the Commission changes somehow. First of all, the stiff (and rather semplicistic) subdivision between the 'world of policy-making' and the 'social work' is challenged. Indeed, Hans introduced a new criteria, which classifies subgroups in relation with the orientation toward technology's implementation they *performed*. It is thus possible to resume the different positions in a *continuum*: on one side we have system's workability in daily life and, on the other, a managerial tool for strategic planning.

This polarization does not encompass the former two-part division; indeed, the commitment toward technology not only positions the actors differently along the *continuum*, but it also identifies new roles and relations. That particularly evident in the case of District representatives approaches: some of them 'move' nearer to the Regional Department's strategic information system idea, the others sustain social workers claims for workability. Consultants express the most radical position toward data gathering for policy making, whilst they relegate programmers aside to the mere task of technical support. On the contrary, also owed to the role they played in PSF and Access-based DSF design, they can be rather seen as *traits d'union*.

To group people according to this latter point of view makes visible a new framework of relations, too. In picture 7, here below, I try to reconstruct them in light of people position along the 'goal sharing' continuum. As the reader can see, different profiles are positioned according to their commitment: at the top those who strive for a managerial approach, at the opposite pole those who claimed for workability. Social workers box is shaded because they did not usually take part to the Commission. District managers and social workers representatives are split in two groups who reflect the above-mentioned orientation toward different technology's implementation. Links are tied among the actors. Their shape and thickness varies according to both the frequency of their interactions and the degree of goal sharing. Strong connections are evident among either Regional Department and Consultants and small municipalities managers and social workers. In other words, the more 'polarized' groups are, the stronger their relations become. Yet, closer to the centre of the scheme, relations become weaker but they increase in number. What I infer from that is that less 'hardliner' groups acted as a glue of DSF design. If I erase from the scheme the connections among them, there would be no paths between the opposite stances. The consequences are easy to imagine: DSF could either never born or be a mere statistic device. Most likely, it would have take much more time to come up with a satisfactory product (not to account for the relational implications it might have had).

Picture 7: Relations within 'the Commission' (stakeholders positioned according to their idea of technology's implementation)



* DM stands for District Manager, WRD for Welfare Regional Department

To analyze Commission's components and their relations is thus useful to frame the activity of the group and possibly understand what the dynamics of DSF design might have been. That figures out the complexity of such an organisational arena in which the discussion overcame the borders of system design to dive into much deeper confrontation on social work imaginary and practicalities. What is worth now is to focus on how this group worked once DSF got implemented, namely how the system got arranged and how it has been maintained aligned with the complex webs it entered *through* Commision's activity[97].

At this point, it shines quite clear that the process of DSF design could not be chased off from its implementation. To take the latter as a starting point for my argument does not signify I considered it as a turning point.

On the contrary, it is a useful acknowledgement that gives light to the development of the process. Observing it from the outside, three different moments come into stage:

[97] To concentrate specifically on the group experience does not mean to neglect all the interconnected dynamics and processes that run either *alongside* and *crossover* it (See upcoming chapters).

1) DSF use and the deriving collection of impressions, suggestions, errors, misfits, interpretative doubts, and so on;
2) groupwork;
3) Some kind of restitution, being it implementation, postponement, agreement, etc.

It is fundamental to say that, at the moment of implementation, social workers had been provided with a methodological manual which contained DSF forms guidelines. If we take DSF release as the main Commission outcome, the manual represents the second most important product. Nevertheless, DSF use had been anything but smooth. As Hans told me, at the very beginning social workers bemoaned technical problems, so that the most urgent task was to fix those bugs. However, as far as DSF entered social workers mundane activities, methodological issues came at stake, and namely how and in which cases to use specific categories. Claims for classifications modifications, additions and cut offs began to rise in consequence to the reflexive use of the system[98]: '*operators go back to data, they re-read them, they engage in confrontation, during plenary meetings, we reflect on data…it is from here that welfare system reflects*'[99] (Mathilde, District manager, T/A). Informed by such a process, social workers representatives then pointed out what emerged to the attention of the Commission.

Therefore, no wonder if, as Hans said, '*social workers* [representatives, N/A] *usually scolded us*!'[100]. Evidently, not everywhere practitioners accepted DSF with arms wide opened, so that Commission meetings became the locus in which to try to address multiple needs, to negotiate, to strive for an agreement on scheduled arguments (even single DSF voices). Social workers representatives put forward all the issues faced in system's use and suggested solutions or changes. Programmers, on their side, had to bring proposals back into technological affordances and strive for a simplification ("*They asked us tons of data we couldn't reasonably implement*"[101](Hans, T/A)). Regional Department and consultants were used to listen to them, defending their DSF vision to finally come to a decision. This process of resuming complexity into simplified fields, form and classes had not always been easy, nor often achieved, so that often social workers representatives "*went back home sad and wretched…you know, a lot of talking but few decisions…*"[102] (Hans, T/A). To be fair, despite the difficulties encountered, this process of

[98] For a more articulated account of situated DSF working out, see chapter 7.2.

[99] "*gli operatori si rileggono i dati, si confrontano, ci riflettiamo durante le riunioni plenarie…in questo modo il servizio riflette*"

[100] "*Le assistenti sociali ci facevano neri!*"

[101] "*Ci chiedevano tonnellate di dati che era semplicemente impossibile buttare dentro*"

[102] "*tornavano a casa sconsolati…tanto parlare e poi non si decide nulla*"

confrontation ended up in DSF workability maintenance. It has not been the case of financial accountability forms, which Regional Department tried to implement during 2007. That demonstrates that a sufficient agreement on DSF 'professional' fields was actually achieved, whilst the irreconcilable difference on funding accountability suggested to give up with the 'administrative add-on'.

In any case, some kind of decision had to be taken. According to Hans, it was Regional management and consultants who led the way, they had the last word. Owed to that, one might question whether those decisions were actually consequent to users requests or not. In spite of that, I think it is rather the case to see what kind of decision, if any, were taken.

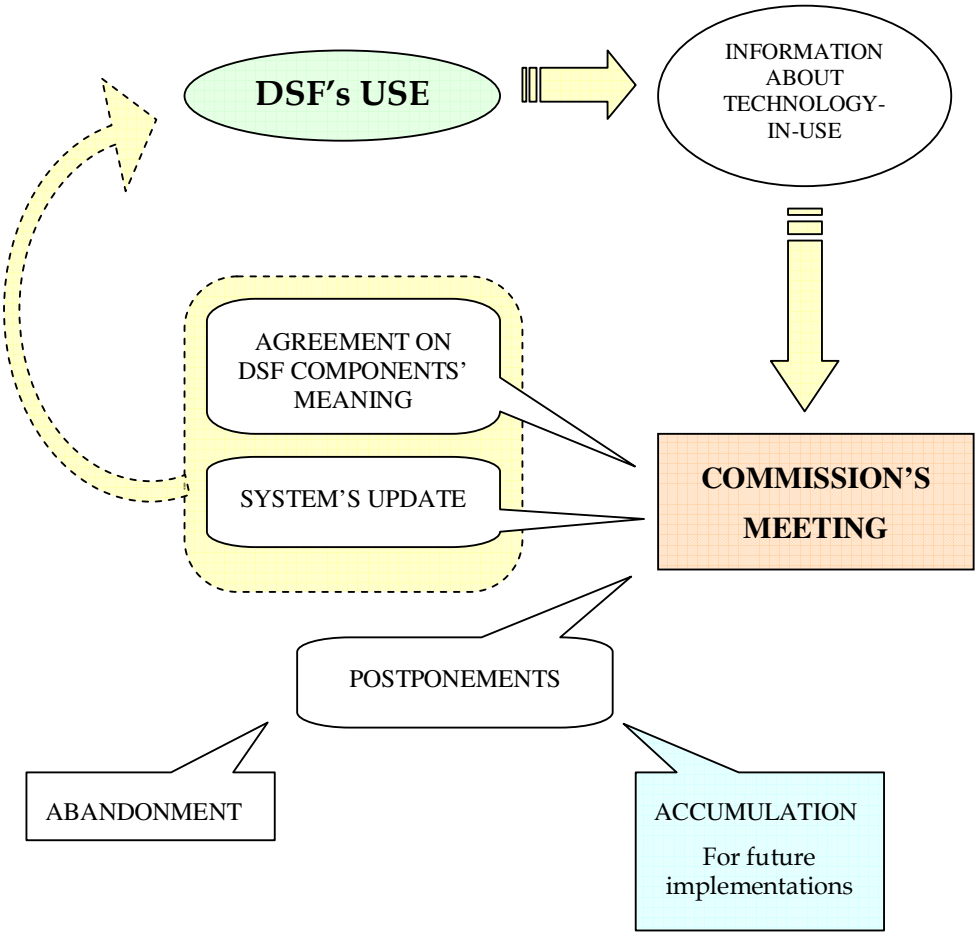
A simple way to account for that could have been to look inside technology and focus and what did change and what did not. Yet, as long as I saw and I heard from practitioners, changes rarely happened: just few of them occurred after the implementation; the only remarkable exception consisted in the Homecare management module implementation (which has been implemented just in two District, anyway). Hence, if Commission's work was so scarce with respect to system's modification, some other outcomes should have been concretized.

An other way to get over meetings discussions was to defer the decisions, so to say there was a more or less stable agreement but it did not lead to any specific implementation. Some of those decisions simply felt apart, most of the others became leading criteria on which Regional Department, consultants and programmers are nowadays re-structuring DSF to build a second release. To me, all those postponements can be resumed into two main groups: on the one hand '*accumulation*', that is to defer a decision to return on it later (together with all the others), on the other '*abandonment*', with reference to all those deferrals which never found implementation.

A third class of decisions did not deal with system's structural configuration but with how the system was used and conceived: it is not necessary to change classifications that do not fit operators practicalities, it is 'sufficient' to negotiate *what the classification means*, despite methodological manual's dictates. Interestingly, what did change in those cases was the manual, so to say the definition of labels. Indeed, Regional Department used to send over updating document to substitute or integrate the outdated versions of the manual.

In picture 8 here below I visually reconstruct what I have just finished to explain.

Picture 8: Groupwork's moments



I tried to draw the picture so to report the circularity of the process. However, it is not possible to conceive it as a closed loop: nothing here starts from one point and comes back to it as it was. Moreover, sometimes steps overlapped, especially those of use and information gathering. Anyways, accumulation, abandonments, reflexivity, breakdowns, simultaneous enactments, all those emergent happenings do not fit in this scheme. They could rather figure out an 'irregular' spiral, but I think it is much more coherent to think about this process as *reiterate*, *recursive* and *reflexive*. The idea of stepping forward, turning back, tinkering, enacting is thus preserved, and it avoids to individuate a stiff trial. The temporal development (meetings succeeded one another) barely covers the recursiveness of the processes: it mostly developed outside Commission's work.

Coming to and end of the paragraph, I can say that those group meetings *have been an institutionalized attempt to keep things together, to align different aspects*, and therefore a

fundamental moment of maintenance (based on use). Indeed, if we look at the process as a whole, the task of designing DSF actually covered (or led to):

1. PSF categories review, who suffered from excessive *granularity* (Bowker & Star, 1999). Indeed, PSF contained information far too hard to collect, along with outdated and obsolete indicators. Hence, such a preliminary review (with reference to DSF design, of course) represented a moment of questioning standardisation system's consistency, so to say its capacity of accounting for the turbulent reality of social work. This process did not come to an end once DSF got implemented, because people realized how the closure that DSF required in theory was far from being achieved in practice (if ever possible, I add). Such a process of classification re-definition did not belong to Commission meeting solely, but it concretized in the practical workout of categories and definitions going on in the workplaces. Thus, this process overcame the mere goal of system implementation[103];
2. a negotiation between at least two different plans of action toward technology ends that reflected opposite ways to conceive social work, care, clients and policy making. This 'crash of cultures' became observable *through* the process of DSF design-in-use, and more specifically through the elements that got embedded in the system and how they have been questioned inside different groups in daily life.

Once again, the problem of maintaining systems is not declined in technical terms, nor it solely concerns operational functionalities maintenance. On the contrary, the exploration of Commission activity supports the idea that there is much more around the theme of keeping systems alive. That has to deal with care and tinkering (Ciborra, 1992), technology enactments (Orlikowski, 2000) and humans-nonhumans assemblages (Suchman, 2007; Ch.15). Group working is thus one among the multiple ways through which things have been, and actually are, kept together.

At the end of the paragraph one question remains unanswered: if Commission's work was actually paying, why did this group expired? According to Brunhilde (the Regional Manager in charge), group ceased its activity "*because in 2007 the most have been already done, DSF was running and it all became a matter of updating*". Hence, from that moment on, accumulation took advantage on negotiation: "*during 2008 and 2009 consultants, programmers and me, we concentrated on the new DSF release, the implementation of homecare add-on and BOWI*"[104]

[103] In the next section I am going to analyze the process of classifications workout in its practical accomplishment.

[104] "*perché nel 2007 il grosso era stato fatto, la CSI funzionava e si trattava solo di aggiornarla*" / "*tra il 2008 e il 2009 ci siamo concentrati assieme alla società di consulenza e ai programmatori, sulla nuova CSI, sul modulo per l'assistenza domiciliare e sul Business Object*"

(Brunhilde, T/A). The absence of meetings did not imply a detachment from District activity, nor an inertial indifference of practitioners. This process of design and redesign, classifications questioning and situated enactments, 'simply' found different 'channels' through which to express, no more institutional but partially institutionalized. In the next paragraphs I am going to describe and analyze those dynamics.

7.2. THE DAILY WORK ON CLASSIFICATION

"[…]*To update interventions and problems classifications is fundamental for this tool not to be detached from reality…I fear that's the risk, isn't it? You know, it's easy to rest on the idea those tools be everlasting, but they aren't!*"[105] (Mathilde – District Manager, T/A)

"*Four months ago social workers set up a group who aims at reaching an homogeneous coding criteria among all operators. Indeed, we noticed a persistent diversity among social workers from different municipalities, a kind of historical work heritage.* […] *Yes, well, at the end an ex-post maintenance is fundamental, too. I mean, someone who checks everything to be in tune and goals operators into keeping records updated. Someone who says 'that's fine, keep doing it', better than 'it doesn't work anymore, let's try otherwise'* […] *That's an ex-post maintenance, coming from our outside. Then, we have our social workers group which represents, as I told you, an attempt of internal maintenance*"[106] (Pierre – DSF referent, T/A)

Both quotations here above refer to a specific workgroup constituted in PN District. I pointed t out because it seems to me a rather interesting experience of institutionalized classifications work.

[105] "*Aggiornare le classificazioni delle diagnosi e degli interventi è fondamentale perchè lo strumento non si stacchi dalla realtà. Temo il rischio sia questo, ecco. Sai, è facile pensare che questi strumenti vadano bene sempre e comunque una volta creati, ma non è così*"

[106] "*Quattro mesi fa le sociali hanno messo su un gruppo per omogeneizzare I criteri di inserimento all'interno dell'Ambito. Avevamo in effetti notato delle differenze persistenti tra assistenti sociali di comuni diversi, una sorta di retaggio lavorativo.* […] *Alla fine ci vuole anche una manutenzione ex-post. Intendo uno che controlli che sia tutto a posto e sproni gli operatori a tenere le cartelle aggiornate. Qualcuno che dica 'ok, così va bene, continuiamo' piuttosto che 'questo non va più bene, proviamo a cambiare'. Questa è una manutenzione ex-post, che viene dall'esterno. Poi noi abbiamo il nostro gruppi di assistenti sociali di cui ti parlavo, che è invece un tentativo di manutenzione interna,* "

Mathilde, the District manager, is one of the social workers who has taken part to the steering group which designed PSF classifications during the nineties. She thus already experienced the complex process of classifications implementation. In chapter 7.1, I tried to reconstruct this process as an articulated and longstanding confrontation among Regional Department, social workers (and/or their representatives) and programmers. In doing so, I framed it into the broader reflection on classifications-building as social and reflexive processes.

Anyway, "*such a tool, let's say, 'ages' very quickly* [because, N/A] *the reality we work on it's turbulent, and this turbulence requires a constant adjustment of classifications contents*"[107](Mathilde, T/A). The District manager herself understood the importance of keeping classifications aligned with the turbulent reality practitioners face. Therefore, she delegated to three social workers[108] the task of going through DSF classifications and 'update' them[109]. What she acknowledged is that, far from being just a matter of institutional design, re-working needs to be firstly accomplished in the field by people who practice technology at work. Furthermore, such an activity has to be *continuous*, avoiding the idea that classifications get settled once and for all. Indeed, classifications use, their put into practice(s), 'naturally' claims for a continuous rework and improvement of categories (Bowker & Star, 1999). Moreover, as Waterton clearly pointed out (2002), it's not just classifications design to be generative (in the double meaning of reflexive and productive), but also and maybe most importantly, the continuous and ongoing work on them once they get implemented. This section will be thus dedicated to this topic.

Let me start with a brief contextualisation of PN District workgroup activity. As said, this group was specifically charged of going through DSF classification system and deeply scrutinize what to preserve and what to change. During the period I spent in the field, there have been three group meetings along with two social workers plenary and a dedicated day with Regional management. After the first meeting, group members shared their work with all the other social workers of the District in order to collect suggestions and critiques. Informed by the debate, group components could then meet Regional management. In that situation they had a confrontation with the Regional manager in charge, the support programmer and two regional consultants. Hereafter, they kept on

[107] "*Uno strumento del genere invecchia presto […] perchè la nostra è una realtà turbolenta, e questa turbolenza implica un continuo aggiustamento dei contenuti delle classificazioni*"

[108] Stefano, Noemi and Amalia are those who constitute this group. They belong to three different municipalities, part of PN District, and they operate in different areas of care, so to cover the whole range of interventions.

[109] To update is here 'virtual'. It means that the output of the work have never been directly embedded into the system (social workers have no skills and no authority to work on the code). It did not lead to an implementation, yet.

reflecting on classifications with reference to what they learnt, supported by a renewed legitimacy. Then the scheme repeated: groupwork first and then plenary sharing.

I will take here the first meeting *after* the regional group work as a starting point. Stefano, a member of the group, did not attended the regional meeting, so that it was told how things went on. They did it in relations with DSF classifications they reviewed. The first voice on which they reflected was the so-called 'Psycho-social counselling' (PSC), a generic intervention of support. Consultants proposed to rename it as 'mentoring'. Here is Stefano's comment:

Stefano – Maybe she was thinking about something different…for me PSC is the main professional activity…

Noemi – they rather inserted that voice thinking about 'The' counselling, you know, something you're entitled to perform after a specific course…

Stefano – good, I used it in the wrong way so many times, then!

Amalia – the same goes for the 'social evaluation' (SEV), too. They wondered why we were so astonished by the proposal to enter it as Non-PCP[110]*. Indeed, to them it doesn't represent a work on clients or, better, it can't be accounted in terms of working hours…no matter if it implies months of work for us!!*

Noemi – Do you see? The logic changed…I never noticed that… [111](T/A)

In Regional management's understanding PSC classification born under the extent of 'what the client receives' and therefore they thought it was appropriate to frame it into the Non-PCP section. From the opposite point of view, this example reports a very common practice among social workers: to use generic interventions (such as PSC) to account for all the fragmented work they do on clients who do not need a continuous care, but 'appear' from time to time. To open a Non-PCP every time would be both time consuming and unconceivable in relation to the idea social workers have of their job. Hence, they usually open a generic intervention and they leave it open for a year,

[110] Without Personal Care Plan, see Ch. 6.1

[111] *Stefano – Magari loro pensavano a qualcosa di diverso…per le la consulenza psicosociale è l'attività professionale per eccellenza…*

Noemi – loro hanno inserito la voce pensando a 'La' consulenza, cioè, qualcosa che puoi fare dopo aver seguito un corso…

Stefano– Perfetto, l'ho sbagliata ad usare un sacco di volte, allora…

Amalia – e la stessa cosa per la 'valutazione sociale'. Si sono chiesti perché eravamo così stupiti dalla proposta di inserirlo in NonPAI. Infatti per loro non è lavoro, o meglio, non può essere contato come ore lavorative…anche se per noi son mesi di lavoro!

Noemi – vedi…la logica è cambiata e io non mi ero accorta…

so that they formally carry out their job on DSF while preserving the integrity of their job imaginary. Far from been a secret, to reflect on such a situated accommodation let Regional Department and social workers to have a wider confrontation on what is worth about working on DSF, what Regional management expected from it and what social workers meant.

Noemi – well, the premise is not to care about data interpretation they [Regional Management, N/A] *might give. It has been enlightening to me…I mean, we often see DSF as a device for quantifying our work, but they continuously repeated it isn't a standard to measure our workload. […] The 'reading' we ought to take is…*

Amalia – Sorry to interrupt you…to me it doesn't account for the care process, neither!

Stefano – So to say, a methodological evaluation of our professional work!?

Noemi – Yes, but they repeated it's not!

Stefano – ok, it isn't, although it shapes our method…

Amalia – They don't think so!

Noemi – It shouldn't be…

Stefano – good…it isn't a workload measurement, though it is used as such in our District!! Ok, it doesn't worth to let them know!

Noemi – Right! Anyway, they said we have to ask ourselves what the client receives. Indeed they told us: 'DSF has to be a social workers tool, to monitor what you're doing with your client'. They kept repeating it is a client-based folder […].

Amalia – Yes, we have to be in client shoes…what does the client receives?

Stefano – that is to say, they're reasoning on a benefits base! The same problem they have with the health system…information systems integration?…the monster!

Noemi – that's what they have in mind…they referred to the health system, indeed.

Stefano – yes…benefits…but our benefits are different. They are mostly immaterial…

Amalia – we know, but they specifically took the example of healthcare: 'how many physiotherapy treatments did X received during 2009? 300? Well, let's record this adequately.

Noemi – …also because social workers profession has changed, and they noticed a lot of resistances. They recognised is not easy for us, but they ask us to align our practice to this model, to this tool.

Stefano – Of course they ask us! So they want a counting-benefits tool? What has been given to clients? To count professional treatments!?

Amalia – Yes…

Stefano – Well folks, if we're scared about it, imagine elsewhere[112]*! Ah ah, armed resistance's in the air, passive guerrilla!* [113](T/A)

This dialogue clearly evidences the distance between the different vision hold on by Regional Department and the social workers. The first pushed for a benefit-based system, the latter cared about making both work complexity and the immateriality of their interventions visible. In particular, social workers worried about the comparison with the healthcare system, which mainly 'reasons' on a benefits base. They seemed to face an unsolvable contradiction (which would become even clearer once they started to scan each single classification system's voice). This

[112] Concerning DSF implementation, PN District is known as one the most 'virtuous' places. There, a couple of prototypes have been tested, they immediately provided updated data and suggestions, they keep constantly in touch with WRD. True, it differently happened elsewhere, too. Anyway, they are supposed to be the most opened to innovation and DSF in specific.

[113] *Noemi – Beh, la premessa è stata che non dobbiamo preoccuparci della lettura che ne danno loro. Per me è stato illuminante, cioè, noi vediamo la regione come qualcuno che vuole contabilizzare il nostro lavoro…ma continuavano a ripetere che non è una misurazione dei carichi…la lettura che ne dovremmo dare è …*

Amalia – Scusa, però non tiene in conto neanche il processo di cura!

Stefano – cioè una valutazione metodologica del nostro lavoro!?

Noemi – sì, ma loro ripetevano che non lo è!

Stefano – ok, non lo è…anche se cambia il metodo di lavoro…

Amalia – Per loro non è così!

Noemi – non dovrebbe esserlo…

Stefano – Bene, non è una misurazione dei carichi anche se qui lo usiamo per questo!!! Ok, magari non è il caso di farglielo sapere…

Noemi – Esatto! In ogni caso, ci hanno detto che dobbiamo sempre chiederci 'cosa riceve l'utente'. Infatti, ci hanno detto: 'la CSI deve essere uno strumento dell'operatore, per monitorare cosa stiamo facendo con l'utente'. Continuavano a ripetere che è una cartella-utente.

Amalia – Ci dobbiamo mettere nei panni dell'utente…cosa riceve?

Stefano – che è come dire, ragionare a prestazione! Il nodo problematico della sanità…l'integrazione dei sistemi informativi…il mostro!

Noemi – è ciò che hanno in mente…facevano riferimento al sistema sanitario, infatti.

Stefano - …prestazioni…ma le nostre prestazioni sono diverse. Sono soprattutto immateriali…

Amalia – lo sappiamo, ma hanno proprio portato l'esempio della sanità: 'quanti trattamenti fisioterapici ha avuto nel 2009? 300? Ok, registriamolo'

Noemi - …anche perchè la nostra professione è cambiata, è hanno notato notevoli resistenze. Sanno che non per noi non è facile, eh? Ma ci hanno chiesto di adeguare le nostre pratiche a questo modello, allo strumento.

Stefano – chiaro che ce lo chiedono! Quindi vogliono un sistema che conti prestazioni? Cosa è stato dato? Per contare I trattamenti professionali?

Amalia – Sì…

Stefano – beh, gente, se qua noi siamo preoccupati, immaginatevi altrove! Resistenza armata… guerriglia passiva …ahaha!

contradiction then led to question DSF usefulness with reference to both social work ontology and practicalities.

Here classifications workout shows how this process calls back to the logics of categories closure. From a minute element this reflexive re-elaboration draws and re-draws the borders of technology-at-work in respect to both its practical implications (*it is not a workload measure though it shape our method*) and the general work imaginary (*that is to say, it's reasoning on a benefits base!*). Whereas this process of embedding and leaving apart has been skilfully documented as inherent to classes design (Bowker & Star, 1999), here it is observable from the living practice of classifications-at-work. At the same time, and of extreme interest, this social negotiation leads participants to go back to their profession itself, acknowledging that is not just the reality *around* them to be turbulent, but that their profession has also changed in the meanwhile (*…also because social workers profession has changed, and they noticed a lot of resistances*). Most likely, what perpetrates the struggle is not only practitioners resistance to change (as Regional Department presumed), but also Regional management belief of the achieved DSF alignment with the pretended transformations of social work.

Going back to PN groupwork activity, the regional meeting's reconstruction gave the way to the proper classifications scanning. They started from the evidence that user's manual had never been updated from the very first implementation, although Regional Department assured them to have already sent a reviewed version, which nonetheless they did not receive. So they simply left the manual apart (I mean, physically closed in the desk drawer) and stepped the diverse sections and classifications, one by one. They skipped very fast through the unproblematic topics, whilst debating on the others. I will here take into account just the recorded sketches who evidence the most interesting points of discussion. I choose three of them in particular.

The firstly reasoned about those Job-support interventions that referred to a special PN project called 'Obiettivo Lavoro' (OL). It is a rather unique project and DSF classes connected with it have been framed into the so called 'home and work interventions'. For practitioners it did not fit very well, though.

Amalia – what about OL procedure?

Stefano – well, we spared 5 interventions.

Noemi – Actually they are just 3, I think it's fine, we don't need to question it any further.

Stefano – ok, let's think about it. Anyway, I wonder if there's the possibility to create a drop-off menu specifically dedicated to OL…

Amalia – we could ask them [Regional Department, N/A]*, but consider that it's just TAR and us to have this special project…I don't know if we can…*

Stefano – yes, but where's the point? Who hasn't got it, won't use it…it's plenty of already expired classifications!

Noemi – yeah, some voices have been left by Regional Department maybe because they are of some worth for other Districts, don't you think? Should we go through each of them?

Amalia – we already signed some of them as 'not to be used' [in the document they are setting up, N/A]

Noemi – Yes, but doing it for the whole region, sounds hazardous to me!

Stefano – No, no, we can't do it!

Amalia – true it's plenty of anachronistic forms…

Stefano – so, we might see those voices and see which are useless for everybody and make some proposals to get over them… [114](T/A)

Hence, such a special project represented a situated (and, in this case, institutionalized) way of doing things which enabled specific workarounds, to which the group tried to find a solution by proposing to embed them into the system. They first of all posed themselves the problem of overabundance, fearing the introduction of other forms to be an additional 'stress' for whom do not need them. They nonetheless had the problem of making their work visible and accountable, and they finally 'justified' their proposal by saying that who did not need that form can easily ignore it. Anyway (and more interestingly) that challenged the plausibility to work out classifications on behalf of the whole regional system. As elsewhere, they decided to cut off whatever useless *for*

[114] *Amalia – e riguardo OL?*

Stefano – abbiamo risparmiato cinque interventi…

Noemi – adesso ce ne sono rimasti solo tre, pensa che possa andare, non ci serve approfondire oltre.

Stefano – vabbè, pensiamoci su. Comunque, chissà se si può inserire un menù a tendina specifico…

Amalia – possiamo chiederglielo, ma tieni conto che l'abbiamo solo noi e TAR…non so se sia il caso…

Stefano – Ok, ma non vedo il problema! Chi non ce l'ha, non lo usa…è pieno di classificazioni che non si usano più…!

Noemi – sì…magari alcune voci sono state mantenute perché interessano alcuni Ambiti, non credi? Dici che dobbiamo vederli tutti?

Amalia – abbiamo già segnato alcuni come 'in disuso'…

Noemi – sì, ma farlo per tutta la regione mi pare pericoloso…

Stefano – No, no, non lo possiamo fare!

Amalia – però è vero che è pieno di cose anacronistiche…

Stefano – Beh, possiamo vedere le cose che sono inutili in generale e fare alcune propostine per andare avanti.

sure, and to delegate the decision to an other proposal to Regional management (in doing so, I argue they acted in a kind of ambiguous way, shifting in and out responsibility). Anyway, this episode documented the outstanding awareness of multiplicity they acquired, not only in terms of multiple work practices but also in terms of the system multiple. Indeed, to speak on behalf other District immediately looked hazardous to them just because they were conscious of different DSF uses, which might be harmed by their proposal (the acknowledgment of practice multiplicity is evidently at the basis of such awareness, something already taken for granted). They clearly pointed that out in the very first lines of the document they licensed, which states:

> *'The group's goal is to produce a proposal for homogenising DSF data entering criteria, being aware that the topic might encompass diversities connected to the specific work practices'*[115] (T/A)

As already pointed out in chapter 6.1, to work on DSF components did not only mean to question classifications black-boxing, but the organisation of care, too.

> *Stefano – Ok, considered the form we have, 'consultancy' flows away…about the notification*[116]*…we conceived it in a different way…now, ' social evaluation' has to start from the day you receive the notification and to be closed whenever you send the profile*[117] (T/A)

Further more, they reflected on the difference between 'Social evaluation' (SE) and 'Integrated evaluation' (IEV): the point is that both of them are variably used to translate all those 'un-accountable' working hours into DSF.

> *Noemi – They noticed that most of the Districts used to leave PSC or IEV opened for…years! Whereas they conceived it as a short term intervention of whatever type of counselling…they did not seem to be happy about it [laughing]…they said it was a strategy to make the working hours weight.*

[115] "*Obiettivo del gruppo: è produrre entro fine febbraio 2010 una proposta di omogeneizzazione delle modalità di inserimento delle CSI, consci che il tema rimanda anche a possibili diversità nelle modalità di lavoro*"

[116] Notifications occur whenever a client is reported to welfare department. It could be either done by people or by other professional services (health offices, for instance); more often by the public security.

[117] *Stefano – ok, data la lista che abbiamo, togliamo la consulenza…riguardo la segnalazione? …noi la consideriamo in maniera diversa…mh, la valutazione sociale inizia dal giorno della segnalazione e si dovrebbe chiudere quando spedisci il profilo*

Stefano – Yes, as most of us do…[118] (T/A)

In this case, interventions time-framing recording came at stake. DSF requires that interventions have a precise development over time, which does not always fit with the real-client's care path. Indeed, time frames have to be questioned under the light of the idea they mirror. It shone with particular evidence about social evaluation's conception: whereas social workers consider the latter a generic intervention to be opened in case of non-continuative care, DSF (or better, Regional Department by the mean of DSF) conceives it under a more literal acceptation, and namely that process of clients social distress evaluation. Once again, classifications workout enables the reflexivity of the 'practice *in relation with* technology'.

At the end of the meeting, social workers had to sum up the contents of their debate. Consistently with the task their District manager charged to them (and most likely with Regional Department *nulla osta*), they aimed at translating everything into a kind of integration to user's manual. Before writing it down, they dashed into a meta-reflection:

Stefano – now we have to write it down, don't you think?

Amalia – Yes, absolutely, for transparency purpose, at least!

Stefano – well, it seems like explaining poker rules…it's better to start playing!!

Noemi – I know, but that's [to write it down, N/A] *the very reason for doing it…Hopefully we aren't going to do it for ourselves only…I mean, I hope the rest of the world don't keep doing as if it didn't exist…*

Stefano – yes…by the way, it is something we write but it educate us, in the end!

Amalia – I was thinking exactly the same, we have to enter this, but it's far easier to do than to explain!

Stefano – that's true, anyway no one ever had such a guideline manual.

Noemi – I agree, it solves some problems…it happened to me too to be doubtful about how to enter specific interventions. True, you have to find the page [of the manual, N/A]*, but once done what you enter it's correct for sure!*[119] (T/A)

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[118] *Noemi – la regione ha notato che molti Ambiti lasciano la consulenza e la valutazione integrata aperte…per anni! Mentre loro la considerano un intervento di consulenza generica di breve durata…non sembravano contenti (ride)…dicevano che era solo una strategia per far vedere il carico di lavoro.*

Stefano – Sì, beh, come fanno molti di noi, in effetti…

[119] *Stefano – ok, adesso meglio scriverle ste cose, non credete?*

Amalia – certo, almeno per trasparenza.

To me, the first aspect to be underlined is their acknowledgement of how much about classifications better deals with practicing them then following manual's prescriptions. However, to write a manual was the very object of their work. Moreover, they seemed to be trapped in a spider web: on the one hand there was the necessity to product an artefact, on the other the awareness it would be useless and forgotten by practitioners. Curiously enough, Stefano said they never had a manual, completely ignoring the user's manual released by the Commission. The implications of all this is threefold:

a) most likely, Regional manual never really entered social workers practice;
b) PN group believed there would be a difference between Regional artefact and their guidelines in terms of reliability at work;
c) (With reference to Noemi's speech) they live in a kind of utopia, since they suspended the critical reasoning they performed on Regional manual, not applying the same reflexivity on their artefact, which will lead recordings to be '*correct for sure*'. In other words, they kind of recognize the generative power of classifications workout, but they surprisingly do not take into account the potential openness of the closure they are going to materialize into their guidelines.

Moving away from PN's case, I will now turn the attention to an other interesting workgroup Organized in Monfalcone (MON)'s District. There the situation was slightly different because the brought together was mainly due to immediate workability needs, whilst in PN groupwork activity was kind of de-rooted from practice flow (indeed, it was much more a meta-work, deeply informed by practical experiences).

Moreover, in MON's case, classification re-work did not unfold 'in-theory' but it got at least partially shaped in practice. As in PN, they came up with a manual. They called it 'the handbook'. Here is how the social worker in charge (Mirella) described how things went on:

Stefano – bene, è come spiegare la briscola…è meglio mettersi lì e giocare…

Noemi – hai ragione, ma è per questo che lo facciamo…speriamo di non farlo solo per noi…cioè, speriamo che il resto del mondo non prosegua placido…

Stefano – già…a proposito, è qualcosa che scriviamo noi che però ci educa anche!

Amalia – stavo pensando la stessa cosa, dobbiamo inserirlo, ma è più facile farlo che dirlo!

Stefano – Vero, ma nessuno ha mai avuto un manuale così!

Noemi – concordo, ti risolve i problemi…mi è capitato di essere in dubbio su come inserire alcuni interventi. Chiaro che devi andarti a trovare la pagina, ma una volta trovata quello che inserisci è giusto sicuramente!

Me – So, Mirella, here's your 'handbook'…that's the way you call it, isn't it? Well, tell me what's inside.

Mirella – we thought about an handbook because a couple of us spent the whole summer in District office updating colleagues DSF. Most of them had a lot of confusion on what each single intervention was about. So we tried to understand what should have been recorded and under which class, reflecting on what does 'psycho-social treatment' (PST) better than 'psycho-social counselling' (PSC) meant. We sort out more or less 15 interventions, those we used the most, so to have a vademecum at hand.

Me – and did you ever review it?

Mirella – not really, but we used it and seemed to be pretty closed to the interventions. We actually did some choice: to record when a client enters the retirement house, for instance, we decided not to use 'residential housing admittance' intervention, but we just enter the preliminary UVD[120] data…later we could decide whether or not to store the file….

Me – in your opinion, how much does your handbook differ from Regional guidelines?

Mirella – Honestly, I don't know if they licensed any updated guidelines, but we based our work on DSF users manual, specifically to better understand the terminology…'treatment', 'evaluation', for instance… we tried to be as in tune as possible, but we couldn't either deny all the work underneath a term…the homecare service is a good example: we stated it's composed by a 'social evaluation' which has to last one month, later comes the PST, the taken-in-charge, namely colloquia, phone calls, home inspections, and further more the homecare intervention, which has to last 12 months by default.

Me – so to say, it is based on your workpractices?

Mirella – of course, we ranked the interventions, so that social workers don't have to browse every time through all the classes contained into the macro-interventions section …sometimes it's hard to find what you use the less…

Me – Did you share it before implementing it?

[120] UVD stands for Unità di Valutazione Distrettuale (District evaluation unit). It is a health system commission which is called to evaluate client condition in order to elaborate a ranking for the retirement housing admittances and funding. It comes, of course, before the taken in charge by welfare system and it produces an official document. In MON district, they decided to use such an 'objective' element as a reference point for DSF data entering.

Mirella – of course, in plenary, as usual. All the reviews we do, we do them in a restricted group first, then we enlarge to other members, then again few of us and finally we share it to all the others. All our documents are licensed through the same procedure.

Me – so you became a kind of 'technical' supporter?

Mirella – well, kind of…I mean, Thalie[121] *is the first administrator and our point of reference, also because she's always in her office, you know, we move around… Honestly speaking, my colleagues call me less than a year ago, they are getting always better [laughing]. True, I did one or more 'private lessons' with each of them…I've been in each and every office teaching how to fulfil DSF. They all have my notes.* [122] (T/A)

In MON District, they thus tried to arrange workpractices and technology in a middle-space, namely an 'home-made' artefact aimed at preserving both the DSF recordings consistency and DSF

[121] MON's DSF administrator.

[122] *Io – Dunque, questo è il vostro manuale…è così che lo chiamate, no? Dimmi un po' cosa c'è dentro…*

Mirella – Abbiamo pensato a dun manuale perché un paio di noi vevano passato l'estate in Ambito a buttar dentro cartelle delle colleghe. Molte facevano confusione su cosa appartenesse ad ciascun intervento. Così abbiamo provato a pensare a cosa sarebbe stato da registrare e dove, ragionando su cosa significasse 'trattamento psico-sociale' piuttosto che 'consulenza psico-sociale'. Abbiamo tirato fuori più o meno quindici interventi che utilizzavamo di più, così da avere una specie di vademecum.

Io – l'avete mai rivisto?

Mirella – no, in realtà, ma lo usiamo e sembra abbastanza attinente agli interventi. Chiaro che abbiamo fatto delle scelte: per un inserimento in casa di riposo, abbiamo deciso di non mettere 'accesso in strutture residenziali' ma di inserire solo l'UVD…poi decidiamo se inserire il file o no…

Io – secondo te, quanto si scosta il vostro manuale dalle linee-guida della regione?

Mirella – Onestamente non so neanche se la regione le abbia aggiornate, ma ci siamo basati sul manuale della CSI…per capire meglio cosa si intendesse per 'trattamento', 'valutazione', per esempio…abbiamo cercato di rimanere aderenti, ma non abbiamo potuto lasciar stare tutto il lavoro che c'è sotto un termine, no?...l'Assistenza domiciliare è un buon esempio: abbiamo deciso che l'intervento prevede una valutaizone sociale che dura un mese, poi subentra il trattamento psico-sociale, la presa in carico, cioè i colloqui, le telefonate, le visite domiciliari, e solo dopo l'intervento di Assistenza domiciliare, che dura dodici mesi, di default.

Io – quindi è basato sulle vostre pratiche di lavoro?

Mirella – è chiaro, abbiamo fatto la lista degli interventi, così che le sociali non debbano spulciare tutte le classificazioni dei macro-interventi…a volte è difficile trovare le cose che usi di meno…

Io – vi siete confrontate prima di usarlo?

Mirella – certamente, nelle plenarie, come al solito. Tutti i cambiamenti li facciamo prima in gruppo ristretto, poi apriamo ad altri, poi di nuovo in pochi di noi e alla fine condividiamo con tutti gli altri. Tutti i nostri documenti vengono creati così.

Io – Quindi sei diventata tipo un supporto tecnico…

Mirella – una specie…cioè, DC è il nostro principale referente, anche perché lei è sempre in ufficio, noi, come vedi, giriamo…onestamente, le colleghe mi chiamano meno dell'anno scorso, stanno diventando brave (ride). In realtà, gli ho fatto lezioni private, a ciascuna di loro…ho girato tutti gli uffici a insegnare come inserire. Hanno tutte i miei appunti…

workability. They started from the empirical evidence they were in delay with respect to the imminent recordings deadline (few social workers person entered all the other social workers data) and therefore they aimed at simplifying complexity. The attempt to align the 'handbook' with DSF classifications did not prevented them to make some deliberate decisions on what to enrol in their everyday practices and what to leave apart (*We sort out more or less 15 interventions, those we used the most, so to have a vademecum at hand*). Moreover, this simplification challenged interventions meaning, so that they arranged classifications according to their ways of doing things (*the homecare service is a good example: we stated it's* […]). It has not been a merely theoretical work, but it has been tested in the workplaces, where social workers learnt its use by practicing it.

Despite the fact the handbook was a shared product, it got questioned in turn. It is what I realised when I spent a couple of days with MON's social workers. There I could notice they usually referred to 'the handbook' for data entering, but I also understood they did not use it slavishly. Although they usually end up to enter data according to their guidelines – maybe adding some notes in the blank fields to specify whatever did not fit – , sometimes they simply choose *what they think it's the best*. That might happen on the individual base but more often it followed a social confrontation (extemporaneous debates among the available colleagues). Episode like this evidences the continuous process of reflexive working out of standards, no matter if they are imposed from the top or risen from a participatory (re)design process.

Whereas the first working group might seem a kind of 'experimental setting', in which practices are brought into through the body of knowledge operators mobilized, the second example is much more tied to the daily copying with categories. Examples of classifications workout in daily life occurred almost everywhere, with different modality and diverse impacts according to the topic and the bunch of categories at stake. As an example, I want here to report an episode happened in TOL:

> *Vanna*[123] *– When we have active PCPs, we always add an 'Integrate evaluation' to the other active interventions, ok? I mean, I might dismiss everything else, but I will still keep on monitoring the situation, right? Then I have to leave something open to 'justify' the taken-in-charge…[…] That's the problem we shared: should we have a taken-in-charge in which the only thing I provide is some funding? Well, that sounded a nonsense to us!* [124](T/A)

[123] Vanna (social worker) heads TOL's childcare area.

[124] *Vanna – quando abbiamo un PAI, abbiamo sempre una valutazione integrate, oltre agli altri interventi, ok? Cioè, posso chiudere tutto il resto, ma contnuo a monitorare il caso, no? Devo quindi avere qualcosa di aperto per*

Then I asked her how they licensed this way of doing:

> *Vanna – In Area's plenary. I remember it was more or less 3 years ago, when DSF got implemented first. We had some meetings to individuate some shared guidelines. […] Anyway, in case of doubt on how to enter specific types of interventions, we always discuss it within the Area meetings.*[125] (T/A)

Hence, here like Like in PN workgroup, the attempt toward work visibility enhancement led to the re-elaboration of how to use classifications.

I would finally recall one of the most outstanding examples I encountered, based on a phone call round among Lucia, Franca and Cécile (respectively social workers and DSF administrator of TAR District). They debate on Homecare service planning, and specifically on how to frame Homecare assistants access to clients residence into DSF forms. They shared their doubts about recording either the daily or the weekly access (DSF field did not specify that). Just after the consultation with Cécile they get over it, but she has been able to provide a solution only thanks to Jasper's informal support. This example shows how wide could be the network enacted to work classifications out *while performing daily activity*: it crossed both internal hierarchy and organisational external relations. Further more, since the whole HCA organisation was going to be reviewed, after a plenary they decided to restructure both service organisation and the related data gathering. The latter organized *according to DSF categories*, implemented just few weeks before. Differently from the above-mentioned examples, in this case the mutual shaping of technology and work revealed to much more tuned on technology instead of on practices. I will return on the analysis of the intra-relations within these sociomaterial assemblages later on this work (see Ch. 8); at the moment it is important to show how classifications-in-use lead both to technology and workpractices (re)definition, so to say it is not a one-way movement[126].

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giustificare l'apertura del PAI. […] questo è il problema su cui ci siamo confrontati: è possibile avere una presa in carico in cui l'unica cosa che hai è un contributo economico? A noi sembra un non senso.

[125] *Vanna - Nelle riunioni di area. Ricordo che è stato più o meno tre anni fa, nei primi tempi della CSI. Abbiamo fatto dei meeting per individuare delle linee comuni. In ogni caso, se abbiamo dubbi su cosa inserire, ne discutiamo sempre in equipe.*

[126] The standpoint of assemblages theory overcomes the separation between humans and things, being it much more concerned with the exploration of intra-relation within the assembled entity. However, I preserve the separation as it rose from practitioners narratives.

There would be hundreds examples more I can not account for here; the stories I told, they seem to me to draw in a pretty clear way the context of classifications workout. We might conclude this multiple process to be inherently social, for at least two reasons: examples show the workout to be mainly performed *through group working*. The dimension and the frequency of those groups vary according to the topic and the practices involved: PN group enrolled social workers from different areas and their aim toward a broad DSF classifications review led them to weave relations with the broader regional system; TOL case concerned childcare activity, so that the group was constituted by the childcare area members, with few connections with their outside; in TAR, a specific service reconfiguration tied different actors (inside and outside the District), and so on. One may argue group working to be inherent to social workers care practices, and I think it is a point on which we might all agree; nonetheless, those groups enrolled also people from diverse professionalisms, along with other actors (both humans and nonhumans). But there is an other aspect of sociality which has to be taken into account here: no matter who or what get mobilized in classifications workout, it is always a generative and reflexive process which overcomes the borders of categories workability. The enactment of classifications gives the way to negotiation, knowledge sharing, professional reflexivity, work networks shaping, and so on.

To simplify for analytic purposes, we might say there are at least three main emergent processes enacted by classifications workout: a reflexive process on DSF ontology; a reiterate elaboration of workpractices, through the extent of meaningful ways of doing things (Lave & Wenger, 1991); and a mutual shaping between technology and work.

What has all this to deal with maintenance, then? In short words, I understand classifications workout as adaptations. I read it as a negotiation process that aim at aligning DSF with work; However, in doing so, it enhances reflexivity so that rather institutionalized practices got challenged: sometimes DSF is bent, sometimes they came closer to standards. In any case, things got arranged so to preserve DSF workability, so to say, what maintenance-in-use is all about.

7.3. BEING IN THE MIDDLE: USERS SUPPORT

After one month of participant observation I decide to take a week off to organize my field notes and arrange further investigation.

Little did I know what would have happened in the meanwhile.

Indeed, as I went back to the field an unexpected news occurred: Jasper, DSF support programmer, has been discharged from his duties from a day to an other. Well I remember how the local DSF administrator (Eloise) – who I was there to follow that day – acquainted me with the bad occurrence:

> "*Jasper is not working for the Regional Department anymore! I'm astonished…they have substituted him with a call centre service! How could it possibly be?! It's a tragedy! We'll miss a reference point* […]"[127] (T/A)

Although what happened scared practitioners, it revealed to be a new window for my understanding of maintenance work. If there's any validity in commonsense, we appreciate things as long as we miss them, so to say, what was going on could have made Jasper's role much more evident.

Why Jasper was so crucial for territories, then? The following two days have been of extreme interest to understand it. That is exactly what I am going to focus on in the next paragraphs.

Before coming to the point, let me go with the reader through an example. As said, I planned to follow DSF local administrator, and so I did. Now, that period of the year was supposed to be quite 'normal' with reference to social workers activity on DSF: trimester deadline was just behind them, so that it was pretty much like social workers already updated their folders. But no one could predict emergency. Indeed, while I was shadowing Eloise, she received a phone call from a colleague who complained about the impossibility for her to correct a mistake she did by chance: she didn't close an intervention but she closed the folder: there was a (dead) client who had an ongoing intervention despite he had been already discharged. Therefore, the social worker phoned to Eloise and explained the problem to her, asking to call her back when she would have managed to fix it.

[127] "*ML non lavora più per la regione! Sono sconvolta…lo hanno sostituito con un call center! Ma come è possibile!? È una tragedia! Siamo senza un punto di riferimento adesso!*"

Eloise explained me that to address this type of claims became her tasks as District management decided to charge her with the task of taking connections between social workers and technical support[128]. She pointed out how the decision was taken "*not to overload ML, since he was usually directly contacted by social workers*"[129] (T/A). Thus – she continued – in case of problems, she tried to solve them by herself before calling Jasper. Unfortunately, as DSF administrator she wasn't provided with any special account (such as power-users), so that most of the time she could just do the job *on behalf* of social workers, but nothing more than that. In the case under scrutiny, she entered DSF using her colleague's account but she immediately realized there was nothing she could do but calling the call centre (CC). I report here some recorded fragments of the conversation.

Eloise digit call centre number and waits.

CC – Hello, Insiel…

Eloise – Good morning, I'm calling from Codroipo, I'm DSF administrator.. I'd like to know if you may help me to solve a problem a colleague brought to my attention. She has to close an intervention which was filed into a dismissed PCP…

CC – [it seems the operator is taking notes] *yes…close…intervention…which was filed into what?*

Eloise – …into an already dismissed PCP.

CC – mmh…alright…and your colleague name is?

Eloise – (she says the name).

*CC – Could you confirm me her phone number is *******?*

*Eloise – Yes, it's correct. I give you mine, as well: 04**-******.*

*CC – ok, the referral number is 62****

Eloise – Thanks, but that mean you're calling me back?

CC – Yes, Insiel colleagues will call you back.

Eloise – Ok, thanks again, bye.

CC – you're welcomed, bye.[130] (T/A)

[128] All District have a reference point between social workers and DSF support.

[129] "*Per non sovraccaricare Jasper, dato che le sociali lo contattavano direttamente*"

[130] *CC – pronto buongiorno Insiel…*
Eloise – buongiorno, chiamo da Codroipo, sono la referente per la CSI, volevo sapere se potevate darmi una mano a risolvere un problema che ha riscontrato una collega. Allora lei dovrebbe chiudere un intervento compreso in un PAI che lei ha già archiviato
CC – (sembra si stia prendendo nota) allora…chiudere…un intervento…compreso in un, in un?
Eloise – In un PAI che ha già archiviato.
CC – allora mi diceva…la collega è?
Eloise – BE
CC – l'indirizzo telefonico è 0432…
*Eloise – le lascio il mio: *******
CC – ok, le lascio il codice della segnalazione che è la 62801.

Once she closed the phone call she looked at me with eyes wide opened and shared with me her impressions:

> "*they didn't even ask me client's name, neither which type of intervention we were talking about! I wonder how could they possibly fix the problem…I fear they will call me back just for understanding the problem…*"[131] (T/A)

And furthermore:

> "*Did you hear her?! Come on, she had no idea of what in the world a PCP is! She's there just to answer the phone!! Poor us…*"[132] (T/A)

Few minutes after, she received a call from Insiel. If what happened could already look bizarre, what followed was even weirder:

Insiel – Hey Eloise, it's Jasper here! How are you?

Eloise – [Surprised] Hi Jasper! I'm fine, and what about you!?

Jasper – I'm fine…as you may see, I'm already involved in DSF stuff…

Eloise – I see, but do they still forward referrals to you?!

Jasper – No, actually not, but I took a week off and since nobody's here…

Eloise – Oh, to add insult to injury [laughing]!!

Jasper – Eh eh, let's see how the situation develops…

Eloise – yes, yes, but once again Jasper, is it you the person who's supposed to answer these calls?

Jasper – no, in practice should be Grete, my colleague who already followed DSF development…but it's not very clear, yet. She should be helped by an other one, so they say…anyway, for the moment the referent it's Grete but maybe she'll be back to system development in a while…nobody knows, it's a mess! Anyway, please tell me what do you need.

Eloise – Of course…it's the case of that elder woman…do you remember? She was in charge to Brigitta [social worker, N/A]… *you know? the one who's dead now…she had different PAIs but just one with an opened intervention.*

Jasper – Again Eloise, please tell me this woman's name…

Eloise – ok, ma quindi mi richiamerete voi?
CC – la richiamano i colleghi.
EL – va bene, grazie, buongiorno.
CC – niente, salve.

[131] "*non mi hanno neanche chiesto come si chiama l'utente, e neanche di che tipo di intervento si trattava! Mi chiedo come possano risolvere il problema. Temo che mi richiameranno solo per capire il problema…*"

[132] "*Ma l'hai sentita? Maddai! Sta qua non aveva neanche idea di ocsa fosse un PAI! L'hanno messa lì solo per rispondere al telefono!*"

Eloise – (she says the name)

Jasper – (working on PC)… let's check the PAIs first…ok, I found it…just a moment…(he accesses the PAI to be closed)…there're a lot of interventions…which one?

Eloise – (She answers)

Eloise helps Jasper to find the intervention and together they decide in which date to close it. They realize social worker opened intervention after client's death.

Jasper – (laughing) Now the only thing we can do is to change every single date in this PAI. Let me see the expiring date of the former PAI… just, you know, to be in line with the chronology… yes, we can do in such a way, why not…you said the woman died, isn't it? No risk, thought…

Eloise – Yes, no risk for the intervention to be re-opened in the future.

Jasper – Alright…done! I closed everything on 18th December.

Eloise – Great!

Jasper – Ok, please give my regards to everybody down there! Maybe we'll se for the new BOWI training course, you'll receive an email from the Regional Department…as long as I know we have to hold this new training period…it goes for you to be more or less autonomous in reporting from BOWI…and not asking me for them anymore. We will work on them nonetheless, but it's better if everybody learns how to do them by himself….

Eloise – Speaking of which, what about those nominal report you use to send us?

Jasper – For the moment, I can't provide them anymore. I mean, it was like a present I gave to you…since I was working at the Regional Department, they pretended not to see it, but now…We have scheduled a meeting…I will propose to insert those variables in the datamart, so that you could have that type of report as well.

Eloise – ok…cross finger! Looking forward to see at the training Jasper! Bye bye

Jasper – See you, bye.[133] (T/A)

[133] *Eloise – Ciao ML, come stai?*
Jasper – bene, bene, come vedi sono ancora in mezzo alla questione CSI…
Eloise – ma scusa continuano a girare ancora a te tutte le segnalazioni?
Jasper – no, nella pratica no, però sono in ferie tutta la settimana e dato che qui non c'è nessuno…
Eloise – oltre al danno la beffa!
Jasper – eh eh, ma vediamo come si evolve la cosa…
Eloise – e io che volevo sperimentare questo call center! Ma mi stai chiamando tu che non è la persona che dovrebbe, giusto?
Jasper – eh, sì, in realtà c'è AK, la mia college che ha già seguito CSI, ma non si capisce sai? Magari ci mettono anche un altro…per adesso c'è AK, che mentre ero in DRS lavorava anche lei, poi non so se lei continuerà a seguire solo la parte dei sistemi…è tutto un casino insomma…vabbè, piuttosto, dimmi cosa dovevi fare, dai.
Eloise – sì, era sempre per la signora per cui ti avevo già chiesto, la CA di CDR, della college BE, sai quell'UT, che ormai è deceduta, che erano stati archiviati diversi PAI, tra cui ce n'era uno con interventi aperti…
Jasper – ridimmi il nome dell'UT…
Jasper – (lavorando sul PC) quindi tu dici che si sono…vado a vedere il PAI intanto… 'spetta…ok l'ho trovato…adesso entro…un attimo…allora…(biascica alcune parole incomprensibili dal vivavoce)…ok, ci sono un sacco di interventi…

The comparison between the two episodes gives a cue for analysing both Jasper's role and how people accomplished the support activity. It is quite evident how in the second case everything ran smoother, supported by a reciprocal understanding and an overwhelming feeling of intimacy between the two. By the way, I remember when I entered the first field and a 'fault-finder' social worker told me that, despite she felt uneasy with DSF, she was encouraged by the fact that "*if it's true I'm not able to understand what technicians say, the opposite is true as well*"[134] (Gallia, T/A). The first transcript reports the same problem: DSF administrator tried to do the best she could in facing the new procedure, actor and language, whilst the call centre operator demonstrated how far she was from the shared language which sustained those type of conversations (*Come on, she had no idea of what in the world a PCP is!*). As Eloise predicted, they would have call her back just to understand the problem. Something was missing. On the opposite, the second case shows how 'simple' things could be when people speak the same language: in few minutes the problem was fixed and a conversation between the two developed. Of course, in the first case none is to blame, for it is quite normal, I guess, that the first encounter in a completely new situation implies such misunderstanding and communication failure. According to Orr (1996), the crucial point in performing errors correction lies on both users capacity to understand the problem and to efficiently report it to the supporter, and the skill of the latter to decode it and translate it into machine language. This argument does not solely deal with language-related issue but on the ability of programmers to figure out where the problem is. In doing so they mobilize their knowledge about machine and machine at work in that specific setting (Orr, 1996).

Jasper – ah, ah...però…allora, le alternative sono: o retrodato tutte le date...aspetta che guardo l'altro PAI, quando l'avete aperto, per avere un minimo di cronologia! Il secondo l'avete aperto il 18/12/2009…e archiviato il 22/1/2010...gli altri sono tutti archiviati no?
Jasper – (lavorando) allora aspetta che faccio…beh, poi insomma mi dici che è deceduta…non dovrebbero esserci complicazioni…
Eloise – sì, sì, tranquillo…quindi poi si chiude definitivamente.
Jasper – bon, ho chiuso tutti gli interventi al 18 dicembre.
Eloise – benissimo!
Jasper – Bene, allora salutami tutti là! Forse ci vedremo per i corsi di WBO, non so se la FB vi ha scritto qualcosa, , dovremmo fare dei corsi ulteriori, così vi illustro di nuovo WBO…– … in modo che siate più autonomi al posto di inviare sempre le richieste. Dopo io o altri facciamo i report, ma se riuscissimo a rendervi autonomi quasi del tutto, ognuno se li fa per conto suo, no?
Eloise – sì, corretto…invece ti chiedo una cosa visto che ti ho qui: sai che ogni tanto ci inviavi l'elenco delle persone che avevano determinati interventi…
Jasper – per il momento questo non lo possiamo più fare…era quasi un regalo, cioè non un regalo ma fin che ero in DRS nessuno diceva niente…faremo una riunione con la DRS, perché basterebbe aggiungere nel datamart di WBO, così almeno potreste farvi anche gli elenchi nominativi da soli no?
Eloise – bon, speriamo che si possa fare, dai. Allora ci vediamo a questi corsi! Ciao ML!
Jasper – va bene, ciao!

[134] "*Mi consola il fatto che, se è vero che non capisco niente di ciò che dicono, è vero anche il contrario*"

I argue, what scattered Eloise was not just communication failure, but the call centre operator ignorance of both social work dynamics and DSF situated use. On the contrary, after years of collaboration with social workers, Jasper 'guaranteed' the capacity of understanding emergent problems. He participated to the steering group which designed DSF, he reasoned with social workers about classifications meaning, he gave *in situ* support, he entered social workers profession following MSAD and BOWI implementation, and so on. In other words, they could rely on a shared way of 'talking about' both machine and work, sustained by a mutual knowledge of 'how things got done'. Better, shaping together how things should get done. Consider how Jasper himself defined his work with Districts operators:

> "*I answer social workers phone calls. They ask me to correct wrong data entering. They either ask me to correct 'in vivo' professional intervention they entered by mistake* […]"[135] (T/A)

And further on:

> "*I shouldn't give any methodological support to social workers, Regional Department has been clear about it, it's their task.* […] *Of course, social workers know better then me where a 'socio-professional intervention' fits instead of a 'psycho-social treatment'. Nonetheless, in time, you know…knowing the matter…I gave them some advices.* "[136] (T/A)

Evidently, Jasper did not simply corrected typing mistakes. I am not saying it was not part of his job, but I prefer to focus on the word 'professional' used by Jasper. Indeed, to keep things running (to maintain system's workability) was not a matter of error correction but of copying with misunderstandings, deviations and classification workout. Jasper understood maintenance to be inseparable from the encounter of different professionalism. Realizing that social workers ask him how to enter specific interventions into DSF did not imply they did not know their work (*they know better than me…*), but rather that DSF use revealed to practitioners themselves the open*ness* of supposed standardized and black-boxed categories (Waterton, 2002), whose borders evidently blurred in everyday practice. The reasons for relying on a programmer advice is then the awareness that he known how to move in that foggy landscape of classification's overlapping. They trust him because of his knowledge, grown and sustained by years of co-work in the welfare system. Thanks

[135] "*Rispondo alle chiamate delle assistenti sociali che mi chiedono di correggergli errori di imputazione. Mi chiedono anche di correggerli al volo*"

[136] "*non potrei dare consigli metodologici alle sociali, la Regione è stata chiara a riguardo, è un compito loro […] poi è chiaro che un'assistente sociale sa meglio di me cosa vada meglio tra 'intervento socio-professionale' e 'trattamento psico-sociale'. Però sai, negli anni…cominci a conoscere la materia…gli do qualche consiglio, insomma*"

to that, he could take advantage of a clearer understandings of what and how Regional Department meant and wanted to be entered, too.

Yet, such a knowledge-based possibility to mediate among different organisational levels, it was not the only reason to rely on Jasper. Indeed, social workers acknowledged that Jasper kept contact with their colleagues outside their own District, so that they usually asked him about how things got accomplished by the others. Either that or it was him who suggested specific entering according to how it was done in the major part of the Region (although informally). In doing so, he acted as a 'weaver' in the system, both 'vertically' and 'horizontally'.

Talking about how he performed his job (namely how he managed Districts problems and claims), whereas the problem seemed to be crucial and deeply undermining the logic of both DSF and social work, Jasper forwarded the claim directly to Regional management and consultants. In such a case he made the issue shifting from a social workers practice-based level to a managerial one, so that not always the solution immediately addressed territorial needs. It also implied a disalignment in times: from the immediate solution Jasper could provide, the problem usually turned into a broader reasoning by Regional Department. Being the latter of Regional interest, management deeply scrutinized the issue and often deferred the decision for homogenization purposes[137]. In case of a standardized solution, they finally spread it to the entire Regional welfare system. However, it did not necessarily address the problem as it rose from the specific workplace, no more.

Hence, this evidence also shades light to Jasper's role with reference to the problem of times. Indeed, a good reason for social workers to contact him was that he could fix the problem 'on the spot'. Since DSF data entering was generally a time-consuming task, social workers tried as much as they could to minimize those lost of time. Hereafter I report a couple of quotation that show how it was crucial for social workers to have a timely and handily support.

> "*I usually phone Jasper, I never write him emails, I need a direct contact.*" (Renée – DSF administrator and social worker)

[137] In the last section I talked about postponements. After *accumulation* and *abandonment* I can point out here a third option: problems solution is delayed in time for reaching a general understanding of the problem and share it so that everybody can rely on a standardized solution.

> "*I usually phone to Jasper, but he's often out of office, so that I have to wait and try more times. That's really problematic for me, since I do everything in a hurry!*" (Lucia – social worker)[138] (T/A)

Most of social workers understand their work in terms of copying with emergencies, so that everything in their practice has to be arranged with the unpredictable unfolding of events. That's the reason why emails came usually either after phone calls or in case of not-urgent support. Stepping back to the call centre fragment, the issue Eloise stressed the most was that an other call from the supporters would have been necessary to understand the problem; to her, it shone like a pointless and useless lost of time.

On the same topic, MON's DSF administrator remembered when, being very closed to trimester deadline and all social workers rushed data entering, DSF channels broke down. Data overload slowed the system down and made it untrustworthy. Thus, she called Jasper and asked for a solution. He sort the problem out by giving them an other District's dedicated IP address, so that part of them could have sent information through a '*faster road*'. I further realized Jasper used this trick more than once to speed up and make social workers job smoother. Once again in MON, I was following a social worker who was about to open a new PCP; DSF ran slowly, it took several minutes to load client's folder. Thinking aloud, the operator stressed the bothering of such an annoying waiting. A colleague heard her and asked:

> *"Did you use the 'fast numbers'?"*.

I wondered what she was talking about, so I asked further explanation:

> *"Well, Jasper gave us a code to digit at the end of the URL, so that DSF runs faster!"*[139] (T/A)

Jasper was using the same trick: re-addressed social workers to an other IP address.

From all those punctual examples, Jasper's crucial role for social workers emerged with evidence: he first of all shared a common language and knowledge with them, then he acted as gatekeeper for knowledge transfer and standardization and he finally made their work smoother and faster, making DSF aligned (or, at least, less dis-aligned) with work times and organisation. Being

[138] *"Di solito Jasper, lo chiamo, non gli scrivo mai e-mail, ho bisogno di un contatto diretto, io!"*(Renée)/ *"Di solito telefono, ma spesso Jasper non è in ufficio, così devo aspettare e riprovare. Questo è davvero un problema per me, che faccio sempre tutto di corsa"* (Lucia)

[139] "*Hai usato i numerini veloci?/ Beh, Jasper ci ha dato un codice numerico da scrivere alla fine dell'indirizzo, in modo che la CSI corra più veloce*"

in the middle of a complex sociomaterial web, he was kind of *favourite hub* of the net. For those reasons, no wonder if social workers used to put Jasper on a pedestal.

However, 'technical support' did not solely stand on his shoulders. Other people remained in the dark. Indeed, as Jasper himself explained me,

"*I am in the middle…I mean, I do the major part of support: I fix wrong data imputations, I give suggestions, and so on…But I can't go beyond a certain technical level. If DSF doesn't work at all, I rely on Insiel colleagues, asking them to fix bugs or reset the server*"[140] (T/A)

As long as the problem had to deal with the database, Jasper was almost completely autonomous, but - in case the problem affected either the infrastructure or DSF business rules - he had to be supported on his turn. Hence, as with important methodological problems, also in this case Jasper did not work alone.

Indeed, social workers were just part of his relational environment: acting as an 'interface' with Districts, he had carried of keeping in touch and support not only social workers but also DSF administrators. Those were followed with reference to BOWI-based[141] reporting activity and, where implemented, to MSAD add-on management. Therefore, Jasper got enrolled in other streams of activity within the welfare system, which mobilized different actors. In order to reconstruct such arrangements, I think to assume the three software's point of view would be the most useful choice.

When I asked Jasper to reconstruct his typical daily, he answered that he used to do a lot of *reports*. Reports he was talking about were BOWI's queries outputs. The introduction of this application specifically aimed at making Districts autonomous in gathering information they needed and it played a fundamental role in data checking processes, too (see Ch. 7.4). I do not want here to anticipate this latter argument but better to show Jasper's role. It had to deal with both issues of time and workpractice enhancement.

As a premise, the reader must know that BOWI:

> "*is extremely complex. I sustained three statistic examinations at the University and still I have to ask Jasper from time to time. It's so easy to make mistakes in querying the database. […] Districts suffer of an high turnover and they do not invest in hiring people with such skills. So, just because it's very difficult to use, it's Jasper who does reports for*

[140] "*Io sto nel mezzo…cioè, faccio il grosso dell'assistenza: correggo gli errori di inserimento, dò qualche suggerimento, cose così…ma non vado oltre un certo livello tecnico. Se la CSI non funziona proprio, mi appoggio ai colleghi dell'Insiel, chiedendogli di correggere o riavviare il server*"

[141] I recall here that BOWI is the software used to manage data so to aggregate them in useful reports. It is implemented both locally and centrally.

both the Regional Department and Districts"[142] (Brunhilde, Regional Manager in charge, T/A)

Ophelie (District manager) and Renèee (her DSF administrator) went even further: to them, to be autonomous with BOWI would not have been a problem if it was part of daily workpractices. Since they ran it no more than once per month (and often less), it was difficult for them to remember software rules and routines. Hence, the easiest solution was to ask Jasper to do reports on their behalf, and I have to say, it was a common habit among Districts. In addition to that, Jasper had the right to organise *nominal* reports, so to say, listed by clients name. District administrators did not have such a possibility and that turned their report to be almost useless for monitoring activity[143]. On the contrary, also thanks to this possibility, Jasper got enrolled in a wider range of activities, such as local policy making, inter-organisational information exchange, but most of all data checking activity and the ongoing process of keeping DSF database in tune with diverse organisations.

Jasper's reporting activity was not only directed toward District, but also for Regional Department consultants and other branches of Regional Public Administration. That positioned him in the middle of an other network. Far from being disjointed from the others, the latter achieved a rather higher integration with Districts domain *thanks to Jasper activity*. Pretty much in the same way he 'weaved' different entities through social workers support, so he did also with respect to BOWI implementation. More than in the first case, here he acted as obligatory passage point (Law, 1987), contributing to keep together things and actors.

This overview could not be exhaustive without analyzing MSAD[144] implementation; it will show off some aspects of Jasper's doing together with practitioners which have not been addressed yet.

Once again, about how MSAD works: social workers enter interventions specifications (where clients live, how many times per week the Homecare assistant (HCA) has to go by him/her, which services to provided to him/her, how often should the case be monitored and so on), which are then

[142] "*è estremamente complesso. Io stessa che ho fatto tre esami di statistica all'università, devo chiedere a Jasper se ho bisogno. È facile fare errori nell'interrogare il sistema […] gli Ambiti poi soffrono di un elevato turnover, e non investono su persone specifico. Quindi, proprio perché è difficile da usare, è soprattutto Jasper che fa la reportistica per la Regione e gli Ambiti*"

[143] See chapter 7.4 for further information.

[144] MSAD is the software for homecare services management. At the time of writing it got been implemented just in two Districts.

organized by the software and sent to HCAs Smart phones, so that they always have an updated agenda at hand. Once they complete the intervention, they record it in their phones; from there, the information is reorganized by MSAD, sent to DSF datamart and recorded into social workers DSF.

Also in this case Jasper played a fundamental role in supporting local operators. Before implementation, he held a training session in each territory. Once there by the way, he did not disdain to provide addition help to DSF and BOWI administrators: in TAR, for instance, he build a set of queries according to their needs. Anyway, coming back to MSAD, the very point was that the software could not run without all data on fine. Therefore, the heaviest work had to be done before software's implementation. That meant for DSF administrator an additional work of data checking, accomplished with the involvement of several different actors. As I will show more clearly in the next paragraph, data checking requires the coordination among social workers, social workers managers, administrative employees, Jasper, other technicians and the Regional Department. To accomplish such a complex task, Jasper provided DSF administrators with nominal reports. Just thanks to those the continuous confrontation among different roosters from diverse data fonts has been possible. Once again, all this work came *before* the system, and represented an important passage for District organisation, at different levels. Consider the following phone call as an example.(Lucia and Franca are social workers, Cécile is DSF adminitrator) .

> Lucia calls Franca, who works in an other municipal area. She [Lucia] is convinced that Franca knows how to enter homecare interventions data, because she was very interested during the training. Lucia explains to Franca her doubt on MSAD weekly planning[145].
>
> - *so, where should I enter the total* [of weekly hours by the client, N/A]*?*
> - *No, no, DB is not there today…But maybe she knows that…*
> - *I entered "weekly", but I'm not sure.*
> - *No, no, well…come on, let's say 5 on 5* [days, nda]
> - *So you say "daily"? is that the correct frequency? What in the world does "frequency mean"? once per day, maybe?*
> - *Are you sure Cécile's not there? I try to call her, alright? Bye!*[146] (T/A)

[145] The transcript refers just to Lucia invoice. Indeed that phone was not provided with vivavoce device, so that I could not register Franca's answers.

[146] *- quindi dove è che devo inserire il totale?*
- no, no, DB oggi non c'è, magari lei lo sa…
- Io metto 'settimanale', ma non sono convinta.
- No, no, mettiamo cinque su cinque, dai…

Then Lucia calls Cécile. She explain her the problem. As an answer, Cécile says tha Jasper informally suggested to plan on a weekly base, so that there will be a standardized base for MSAD to correctly plan. After the call, Lucia starts to record data according to that criterion.

Once again Jasper not solely managed the 'technical', but entered the 'professional' world as well (if we could possibly draw a line between the two, anyway).

At the end of this paragraph, I resume in the following table the different tasks carried on by Jasper while supporting territories and Regional Department. I distinguished the activity according to the people he worked with, *on* each software in use.

Table 7: Jasper's tasks, subdivided among professional people he worked with and software.

	DSF	MSAD	BOWI
Local level			
DSF Administrators	Nominal reporting		Queries building Training day teaching Support Training in the workplaces
Social Workers	Error correction Technical support Informal Methodological support Nominal reporting Hinting	Error correction Technical support Informal Methodological support	
MSAD administrator	Error correction	Error correction Technical support Informal Methodological support Nominal reporting	
Homecare Assistants		Technical support	
Regional Level			
Management	"technical" counselling		Reporting
Consultants Agency	"technical" counselling		Reporting
Insiel colleagues	Gain programming support	Gain programming support	

This prospect reconstruct all at once the connection entailed by Jasper while exploiting his tasks. True, in doing so it went far beyond what was conceived as 'his institutional tasks', drawing a

- quindi tu dici 'giornaliero'? è quella la frequenza? Cosa diavolo vuol dire frequenza? Una volta giorno, forse…
- ma sei sicura che DB non ci sia? Io provo a chiamarla, ok? Ciao

practical distinction between 'what he was supposed to do' and what 'he actually did' (Pickering, 1992). The rhetoric of mansions subdivision thus broke down in practice. The interactions among different professionalisms hence individuate multiple assemblages of knowledge and duties which blurred the borders of the work-on-paper.

The daily performance of support enrolled artefacts and activities which did not belonged theoretically to the sociomaterial environment planned in advance. Nominal reporting and informal methodological support are just two simple evidences of how practitioners enact whatever in need to get things done properly and smoothly. My argument pushes the reasoning even further: this working things out in practice keep maintaining aligned all those elements which are not aligned on the paper (although the efforts of strategically keeping them as closer as possible). Even if it is both impossible and far for my aims to predict how things would have been without Jasper, it is pretty clear the role he played (not alone) in assembling things so that the system keep running. Moreover, whereas in the former paragraphs what I took into account was just DSF work, the analysis of Jasper's activities shades light to the broader information system, of which DSF is just an element, although central.

Jasper (and Hans before him) are thus two examples of programmers who kind of refute the traditional idea of computer technicians. Far from being concerned with technical tasks, they rather performed them informed by the multiple encounters they had. Thus, they brought into maintenance all those social aspect that revealed to be much more useful to solve problems and enhance system's use. I argue, the added-value they put into stage, do not solely derived by the possibility to deploy their creativity, as Read (2003) argued, but mostly relied upon their capability to mobilize things together, acting either as use designers, translators and weavers.

7.4. DATA CHECKING

The activity of data checking and the processes around it are fairly variegated. In analytic terms, I can posit a preliminary distinction according to which institution 'stimulates' the monitoring. Indeed it may be either an 'internal affair', in case data are requested from the inside of local organisation (District Management, Local Politicians, other Local Institutions), or solicited by the outside, namely other Public Institutions (Province, Region, National Institute of Statistic, State). Most of the requests are on-the-spot or have prearranged deadlines in the course of the year.

In these paragraphs I will rather concentrate on those which are more regular and spammed. I will focus on those who play a more central role in maintaining system's consistency, an namely those coming from the Regional Department. Under the aim at monitoring specific Regional projects (namely those that politicians decide to fund the most), management reiterately asks District to keep DSF updated. They do it through the stimulation of data checking, so to say, they ask District to check the truthfulness of their reports by deeply scanning the related DSFs.

Why Regional Department should ask Districts to validate their data, since they just report them from the same database that contains locally stored data? Logically speaking, data should be exactly the same. Yet, for technical reasons I can not address here[147], they differs in practice. Indeed, social workers are supposed to enter clients data immediately after the colloquium. In practice, I can't remember a single case of such a contextual fulfilling, nor practitioners told me they were used to do as such. That would be an exception. They rather do it in the spare time, at the end of the day, or once per week. That do not represent a problem for them since they rely on paper notes they take during colloquia and immediately after it. As I already pointed out (see Ch. 7.2) Regional management was in the know. Hence, it would not be a problem for the latter if further postponements would not occur. What are we talking about? Some examples will help us to specify the problem.

Since Regional department usually checks data every three months, it is quite common among social workers to collect data on paper (or on other digital storing devices such as spreadsheet files) and enter them into DSF just few days before the deadline, all at once. It is not a matter of laziness, it is a way not to let DSF interfere with working times.

[147] According to what Hans told me, it is a matter of data synchronicity.

However, postponements are not always due to social workers habits, but to the broader organisational environment, inter-organisational arrangements and work practices. The case of Autonomy support fund (ASF) – which is one of the projects under scrutiny by Regional management – is particularly enlightening. Indeed, from the first client-social worker meeting to the official taken the case has to be firstly evaluated by an external commission (the UVD I was talking about in Ch. 7.2), and then the dossier has to be processed by local welfare department. It could take months for the procedure to become effective. In the meanwhile social workers carry on with clients care, but they do not usually open a DSF because the intervention can be stopped at anytime. If it is the case, they will have to step back and cancel the record. In order to be sure of entering data once and for all, they usually wait the official confirmation from the welfare board. Since the latter usually licenses dossiers once per month (no matter if already effective), social workers record clients into DSF with days or even weeks of delay.

An other order of problems occurs as clients status changes. Take as an example the case of a minor who is in charge while waiting for a foster care act. Of course, social workers do not provide him/her with legal aid, but rather support him/her from the relational and psychological point of view. Now, this care practice is not affected by any court decision (namely, it remains a support intervention), but from the system's point of view an other folder should be opened in case of change in minor's situation. To record it or not, it is a matter of how strictly social workers follow professional criteria in data entering, instead of statistical. It is like what I told about professional time frames that do not always fit with those embedded into DSF (see Ch. 6.2 and 7.2).

Being for bureaucratic reasons or for professional choices, those example are useful to show how DSF is not constantly updated. True, Regional department does not usually compel about it, and they 'informally' content themselves if data are properly entered every three months. Well they know, social workers are often in lack time and they are conscious of the diverse DSF uses, too. Moreover, since they know how professional autonomy is a key aspect of care, they avoid to impose stiff deadlines and controls who may interfere[148]. Anyway, in 2008 and 2009 Regional department released specific projects for disabled people support and reducing poverty. These two have been heavily funded and become very popular (also in the public opinion), so that an accurate

[148] The idea that DSF is actually used by Regional Department to take control over social workers sometimes rose from the narratives of the latter. However, according with what I saw, things are not so bleak as some practitioner told me them to be: true, Regional Department care about DSF to be constantly in tune, but it seemed to me that the software is not used to compute social workers activity. Anyway, That reveals how the aspect of power struggle has been translated into the system.

accountability was required. For this reason, Regional department started to check project-related data every month.

Before looking at how this process unfolded, I want to briefly point out why it is so crucial for understanding maintenance. As said, we may say it represents an attempt to keep things aligned, and therefore it has to deal with the broader process of keeping system operational. As I will have the opportunity to show hereafter, data checking concerns different welfare system's activity, so that it involves different practices in and out local contests, along with the different sociomaterial assemblages they mobilize. It also shows how situated practices of DSF workaround have been more or less tacitly institutionalized: they are not only 'tolerated' but acknowledged as ways in which things get done. Hence, differently from situated workouts, together with District support , data checking ties connections at the broader regional environment level. Owed to that, maintenance-in-use is neither a centrally-managed activity of preserving system functionalities, nor solely a matter of situated enactments. On the contrary, it is shaped by the cross-level and cross-professional mobilisation of specific arrangements. Data checking is kind of paradigmatic in this sense.

But let's do one step at once. Hereon I will reconstruct the activities encompassed by data checking process. In doing so, I will sort out the commonalities I saw in the different Districts I entered. For clarity purpose I posit this process to be linear, although I conceive it as recursive, interactive and rooted in everyday workpractices.

The process begins with a Regional Department's request to the Districts to validate data they reported from DSF datamart. Such a type of requests are usually due to specific political inquiries, but in the recent past it become a routine for the reasons I just explained. Hence, the Regional Manager in charge sends the communication to District Managers (DM), usually by mail. In case of a standard request, she forwards it to all District, otherwise just to those concerned by specific reports. DM, on their turn, forward the communication to DSF administrators. From this moment, the procedure can step different paths. In order to better reconstruct the process at stake, it is useful to approach it as if it was a playbook: the one in which the reader can 'jump' to different pages according to the preferred final. However, being the final definite, what changes is the trial to follow to reach it. Therefore, what I am going to do is to acknowledge the different possibilities and try to tie connection among them without loosing the texture.

DSF administrators are thus charged with Regional department's report validation. It means for them to take a stab at cross-checking, so to say to confront regional data with 'something else'.

The very first step is to check their personal reports, coming them out from BOWI queries or from other listing they build to monitor DSF data entering[149]. If data match, they simply send an email to Regional Department to confirm report contents. They usually put Local Managers in copy. I have to say, it has never been the case during my presence in the field. Indeed, data usually do not perfectly match, so that further investigations are needed. Anyway, from the very beginning data checking process shows its implications: on the one hand it could be interpreted (as some social workers pointed out) as a way to control local work on DSF; on the other it is a way to implicitly educate and sensitize social workers to data collection.

In case of data mismatching, Local administrators could choose to follow different options. None of them is 'the best one', since that is heavily depending on which 'kind' of data is to be checked (dimensions of the aggregation, relation with funding data, nominal reports, and so on). None is exclusive, neither, owed to the evidence that to rely on just one of them is usually insufficient.

a. the first way is to duplicate regional report by running the same query on BOWI and check where the problem is. In most cases, it is a matter of how many cases are missing or should not be computed. Sometimes reports are untrustworthy because of the excessive amount of scanned data. Thanks to this procedure, BOWI works just on the local dataset, lowering errors ratio. It is the more rapid way to check, and it avoids to ask anybody for additional reports. Nonetheless, there are several issues that usually discourages administrators to proceed in this way:
   ~ first of all, this procedure works just with small numbers. Indeed BOWI does not list case by names and surnames but just by ID. Thus, it is hard to step back and find which are the missing cases or those in excess, unless the number of cases is minimal. Sometimes DSF administrators get over it by cross-checking with their own reports[150], or directly asking social workers. They rely on this latter option just in case of be a very simple and rapid check (indeed, BOWI has been implemented to discharge social workers from reporting duties and it would be barely acceptable to go directly back to them);

[149] Indeed, most of DSF administrator are provided with personal tools as kind of 'preventing job': they set up them with all the information arranged not to loose too much time when Regional department claims for data to be checked. It also show how data checking shaped the way in which they 'take care' of system's update.

[150] Particularly interesting is MON's case, where they have a ten-years old database from which DSF administrator can easily report updated data. Although it solves much of the problems, there is still some work to be done to satisfy Regional requests.

- ~ If it does not work (and administrators know it is most likely the case), they will have to ask someone else for some kind of support. In this case, to 'reverse-engineer' the query would be just a useless passage. To avoid the risk of loosing time for nothing, DSF administrators usually prefer to skip this step and start directly from the next;
- ~ BOWI is still far too difficult to use for most of administrators, so that they prefer to refer directly to other sources, instead of making any attempt of query building.

b. The second solution aim at working around BOWI limitations: it consist in asking the support programmer to provide an updated report with people listed by name, surname and address. Differently from the regional report, this one makes clients immediately identifiable, so that they can either easily check their presence in their own report, or ask social workers more specific questions (so to say, less time-consuming researches). That implies the other storage files and social workers participation, but it represents a 'rapid and clean' way of data checking. Moreover, this is the only method available to check specific clients characteristics, and namely distress complexity, family status, integrated taken in charge, and so on. Consequently however, that does not prevent administrators to ask social workers.

c. A third and frequently used solution is to retrieve data 'somewhere else' or, better, from someone else. This solution is mainly enacted when Jasper's report is insufficient and it is not possible to ask social workers. Indeed, to discharge social workers from data providing seems to be the leading criterion of this activity, so that this source of information usually misses. It is not just a matter of respect, but also a matter of convenience: social workers are hard to contact during working time, so that it would be difficult for administrators to timely satisfy regional requests. Since administrators themselves do not have (or are supposed not to have, see next page) direct access to client's data, the only solution is to ask people who have them. Since most of interventions have related funding and clients benefit from public grants, it is most likely the case that administrative employees register them somewhere. These latter are thus often asked to forward their data and/or reports (most of the time spreadsheet files or printed copy of them). Far from being just a matter of availability, grants reports have also the advantage to be constantly updated, so that they perfectly fit for the purpose. Less frequently, and just in case of emergency, administrators could ask data to other professionals such as homecare assistants, youth workers and psychologist.

Once provided with the reports they need, administrators have to find out where the incongruence lies. Most importantly for them is then to figure out the reasons that made data dis-aligned. How they do it? From what I saw, the procedure is somehow standard: they print the report and sort cases one by one, focusing on what matches and what does not. Excepting from smaller dataset which could be checked on desktop switching from different spreadsheet, this process is mainly an handcraft work. The very first thing they generally do is to print every report on paper, so that they can work on it (e.g. highlight different data with different colours, take notes on borders, tick off, and so on). Almost everywhere cross-checking is accomplished on paper. Although that is mainly an individual activity, sometimes administrators ask someone else to help them in doing a more accurate job ("*four eyes are better than two, it takes nothing to miss a 'zero' and loose everything!*"[151] – Ophelie, District Manager, T/A). Such a cooperative work could be performed together or deferred in time (e.g. DSF administrator checks first, then send the report to the Area Manager) However, cross-checking is tricky because it is repetitive, it requires a lot of concentration and a single error can invalidates the whole job, so that it is preferable to have someone who follows you *in vivo*. For those reasons, people get together especially when they have to scan big datasets. Who are those people? Generally speaking, those who already know the topic under scrutiny: administrative employees for grant-related data, homecare assistants or Area Manager [152] for those related with care process. Doing it cooperatively allows to more easily find mismatching reasons and to communally decide which of them can be ignored. Moreover, that enhance the understanding of clients and their care process. Indeed, data checking is nothing but a simple ticking-off activity. On the contrary, practitioners try to sort out the reason of mismatching; in doing so, they inevitably reflect on both social workers practice and data management.

Finally, the enhanced possibility to solve problems avoids DSF administrator to ask social workers; that speeds the process up and make them independent in their job.

Once checked data on paper and outlined what does not fit, DSF administrators have to either correctly enter data into DSF or to explain to Regional Management the reason for the impossibility of correct them.

[151] "*quattro occhi sono meglio di due, si sta un attimo a perdere uno zero e mandare all'aria tutto il lavoro!*"

[152] The majority of Districts has already institutionalized this profile, although Areas are not univocally defined. Area Managers are social workers discharged by clients care and re-assigned to a management position. They coordinate social workers, look after Regional projects implementation, mediate between social workers and District Management, etc.

I will start from data correction first. How is it accomplished? There are two ways to do it, depending on who corrects data in practice. Indeed, it could be done either by social workers *or* DSF administrators. That could sound pretty weird owed to the fact that DSF is supposed to be a professional tool and therefore no one but social workers should be allowed to access DSF database (with the exception of programmers, of course). However, in three of the four Districts I entered, a tacit agreement dealt between social workers and Local Management ordained that DSF administrator enter social workers DSF accounts by using their passwords. In such a way, most of errors could be corrected by administrators themselves on social workers behalf, discharging them from that onerous task. Nonetheless, it does not mean social workers do not enter the process. Indeed, that rule goes just for correcting mistakes and/or bureaucratic data[153]; in these cases administrators enter the account, fix the error(s) and communicate changes to social workers. However, DSF is constituted by tens of fields that are strictly connected with the care process. With reference to that, DSF administrators are not allowed, and would not dare to change anything without asking the social worker in charge first.

Hence, despite DSF administrators effort not to do it, it seems there is no way out from consulting social workers, somehow. What changes is how to do it, and I could notice several options. In case of a restricted range of errors, the easiest way is to phone social workers. According to the urgency, it could be done either during data checking or whenever administrators know social workers to be available (generally at the end of the day or out of business hours). As an alternative, emails are popular, too.

On the contrary, when mismatching data are more considerable and concerns different operators, emailing is preferred. In such communications, administrators uses general expressions such as "*Regional department claimed for a report on disabled children in charge, please check whether your data are updated or not*", or "*monitoring HCA data I realized most of you are in delay with DSF fulfilling, please do it asap*"[154] (various DSF administrator's communications, T/A). In order to make things easier for social workers, sometimes administrators set up *ad hoc* standardized forms or spreadsheets. Their worth is twofold: they avoid social workers to enter each and every DSF who contains an error and enhance administrators checking activity, since all the information is organized according to their needs. This solution is often deployed in those Districts

[153] A valuable example comes from TAR District: the software for homecare management required data to be perfectly entered. One of information was to signal the funding Institution. Due to a collective misunderstanding, none among social workers entered the correct one. There, DSF administrator spent a working week in entering each and every DSF to replace the wrong data.

[154] "*la Regione ci ha chiesto un report sui minori disabili che abbiamo in carico. Controllate se avete i dati a posto*"/ "*controllando i dati sul SAD mi sono accorta che molte di voi sono in ritardo, fatelo il prima possibile*".

in which is DSF administrator who fulfils DSF. These 'homemade' devices are used on a daily basis to collect just fundamental data and discharge social workers from completing the whole folder's form. In such a way, it is social workers who give data (so to preserve their professional ethics) but they do not spend time on DSF either, being the administrator who fills DSF forms.

A third way, generally enacted in case of widespread mismatching and relative low urgency, is to discuss the problem in plenary (or Area plenary). This solution fits in case of unexpected changes, recursive errors, unsolved disagreements on DSF classifications, and unclear data entering criteria. In plenary, administrators inform social workers about the problem at stake, they try to cooperatively find an agreement on the solutions and, consequently, to share common criteria on how to enter data thereafter. That implies data entering to be social workers tasks. Interestingly, from the issue of 'how to provisionally fix errors', such an activity leads to a more general reflection on 'how to do things on a daily basis'.

The last option is to commute in the workplaces to collect data, but I can say it is just rarely the case because it is an invasive and time consuming practice for both social workers and administrators. It is mainly used if problems pertain to a single operator or workplace.

Thus errors can be fixed by both DSF administrators and social workers. I already pointed out how administrators accomplished such a task. What about social workers? How they do it?
Data checking is largely a matter of cross-checking, of comparing reports with data stored 'somewhere else'. For social workers, this 'somewhere' can be:

- *Personal reports*: aside from DSF, almost every social worker has different clients lists, generally sorted by intervention. They could be either digital or paper-based, although it is much frequent the latter. Thus, they compare these reports and then enter data into DSF;
- *Paper Social Folder*, their complete and constantly updated source of information. As seen, it represents for social worker the most intimate tool in which they report information they not usually store into DSF. Before entering data they thus browse paper folders. True, it is a time consuming activity but it is definitely the most used one because in PSF they trust the most;
- *Memory*: no longer a scientific method, but social workers often rely on their knowledge on clients, informed by the lived experience they have with them. This way of doing is the handier and it often represents the solution to data vacancy.

In practice, none of them is self-standing but they are usually enacted together. Data checking is indeed everything but linear and univocal. On the contrary, it is pursued through both the recursive cross checking, and cooperatively with homecare assistants, Area Managers, colleagues,

professionals with whom they work on clients (also outside the welfare system) and DSF administrators. Ongoing errors, reflections and changes are usually encompassed as well.

Once social workers come up with a solution to the mismatching, they communicate it to the administrators, mostly via email.

To fully cover the range of data correction a last topic has to be pointed out, considered that not everything can be possibly fixed at the District level. Indeed, some blocks have been embedded into DSF not to allow users to constantly re-manage stored data. They had the function of preserving database 'integrity', as to say the possibility to compare data in time and space. Just to give an example, if social workers enter the wrong intervention's starting date they can not modify it once they save the recording. In such a case, they have to close that intervention and open a brand-new one, and that of course costs time (also because DSF usually loads pages very slowly). Almost the same goes for several other fields and forms, so that both social workers and DSF administrators started to ask support programmer to directly manage the database (see Ch. 7.3). Consequently, a relevant part of data correction is accomplished by Regional technicians, Jasper in particular. Owed to the 'familiar' relation grown among Jasper and practitioners, the latter directly keep in touch with him. DSF administrators usually via email, whilst social workers, who need the errors to be fixed *in vivo*, by phone. This 'turn to programmer' reveals how DSF-related processes are intertwined: in this case technical support represent an unavoidable step in data checking. The other way around, general reference to technical support is stimulated by unsolved mismatching reported while checking records to be on fine.

Anyways, through different paths, data checking activity comes to an end. At this point, is quite reasonable to think it means Districts data perfectly concurs with the Regional, so that the validation can be definitely considered achieved. In case of small numbers, it is almost the case. Indeed, the smaller the aggregation is (no more than few tens) the more DSF administrators care about the single unit to fit. In case of persisting mismatching, they can usually figure out the reason why.

The more the aggregation grows, the easier errors come into being and the less is possible to reconstruct which are the cases that miss (and, of course, the reasons why they do not match). As long as case aggregate, numbers tends to become fuzzy, cases get lost in the work flow, classifications loose their constraint and the mobility of cases in space-time becomes too heterogeneous to be sorted out univocally.

Owed to those unavoidable difficulties, how practitioners keep database consistency (and therefore maintain the system alive)? Indeed, to ignore Regional Department requests is not an option: things have to be sorted out and kept in tune somehow. I argue, the solution is twofold and opposite: on the one hand, administrators and all the other actors who might get involved, they stringently scan both reports and DSF records, no matter how much could it take. Through this process, issues of disalignment between workpractices and standardisation get to the foreground. To get over it, administrators can either carefully replace mismatching data for the solely validation purpose or they could stimulate a broader reflection on how to store data so that they re-align with regional requirements (or, at least, to align internal procedures). That is an attempt of negotiating between how data *should be* stored and how *they're actually* stored. ASF example reported in Chapter 6.2 is particularly indicative: ASF is a regional project aimed at aiding disabled and non self-sufficient people. Following the established procedure, from the application's date to the project's approval, even months could pass by. Hence, when should a client be considered 'in charge'? Some social workers used to open a DSF after the very first colloquium, for it was clear for them that the person needed to be followed; some others used to wait until they received health department commission's official answer; still others preferred to wait the municipal bureaucratic approval. Due to those heterogeneous practices and the lack of an homogeneous criterion, data entering was definitively patchy. However, in each territory I entered, a common rule emerged: they enter ASF intervention as long as they have the municipal approval's protocol date. Differently from the Health Department Commission evaluation form, the latter is an official act from the organisation to which social workers belong. It doesn't mean that there is a shared rule for opening DSF folder, but for opening ASF interventions[155].

The second option is based on opposite concept: data are checked and fixed as well, but the validation criteria of 'perfect matching' is substituted by 'plausibility of information' and 'mismatching acceptability degree'. Indeed, according to what I said about big aggregation, the impossibility of a 'perfect matching' is kind of a taken-for-granted by practitioners (well understood, it is not just a local statement, but regional, too): too much variables concur in defining how data are stored. At the same time, it is not easy to identity a shared way to conceive plausibility

[155]The above mentioned example can be seen as a way social workers 'abdicate' to technology's constraint. Are they totally undergoing standardisation? To take a closer look, they preserve both the visibility of their work and the professional identity by working around the straining. True, they open ASF intervention long after the first colloquium, but, at that time, most of them assign a DSF page to the client in any case, by opening a generic intervention, namely either "psycho-social treatment" or "social evaluation" (to cite the most popular). These interventions could then be closed once opening ASF intervention or keep them opened till they 'naturally' expire (in DSF, each intervention has a pre-assigned date of expiring).

and tolerance among different territories. It may depend on shared way of doing things, how social workers understand and practice categories, data entering routines, typology of data, and so on. It does not only vary in space but in time, too. Plausibility and acceptability become leading criteria for both big aggregations and for those who are not of crucial relevance for the organisation in the particular moment validation is required.

Moreover, plausibility seems also to be a way out of 'residuality'. Let me explain this concept through an example: in May 2010 I had the opportunity to observe a data checking process. Regional Department asked Districts to provide the total amount of ASF clients. Due to DSF problems (the database had not been refreshed for a while) and workflow procedures (ASF data were outdated for a lack of communication between the administrator and social workers), data reported in the document provided by the support programmer were far from being comparable with the Regional list. So, the administrator checked her own database, understood the reason for the mismatching and corrected mistakes. Once finished, the amounts were just slightly different (few cases were missing on hundreds). Those mismatching cases were her residuals. Considered the nature of Regional information needs, she 'decided' that few missing cases would not be relevant and therefore she quit checking and answered to Regional Department confirming data validation. To me, it shone to be no longer a matter of 'how many mismatching cases should be accepted', but better the ratio between how much time would have taken her to find a solution and the relevance for both organisational and regional needs. It is specifically through this extent that plausibility represents a central topic for maintenance: mismatching management and errors tolerance are fundamental to preserve a satisfactory degree of system's consistency. Once again to keep system operational and workable is not a matter of fixing but to acknowledge and accept disalignment as integral parts of the mediation.

From the Regional point of view, to ask for data validation does not solely aim at maintaining the database updated. On the contrary, they stimulate a sensibility toward keeping data constantly and timely on fine. Through the acceptance of a partial mismatch, they acknowledge diversity and multiplicity, but this rather inconsistent habit allows them to collect suggestions about DSF-in-use and the related problems.

Specifically due to this data checking requests, some social workers blame Regional Department to use DSF as a kind of 'Big Brother' to take control over them. The issue of power-relations and practitioners exploitation is of absolute interest, but I think it does not help to aim at the point of my argument. Instead of accounting for this process in negative terms, I am here concerned with the implication it has for understanding maintenance-in-use. As I said, it contributes

to decline the problem in terms of acceptability, disalignment and data plausibility. However, it also concurs to organizing social work: by this mean, social workers reflect on their practice, on how they conceive the activity of care, how to represent their work to the outside; data checking also improves communications and knowledge sharing among both hierarchical level and professional communities, blurring the institutionalized power relations and the boundaries between professional knowledges; something that is done locally mobilizes in practice knowledges, artefacts, people, roles and the multifaceted material world of all the regional welfare system

'COUNTERVAILING STOCKS'

In one of the Districts I entered, I observed a curious practice for making data to match. As told before (see DSF history, Ch. 4.3), there is a special group called 'past-through clients', and namely those who have been registered in the system for two or more successive years, no matter whether they benefit of consequential interventions or not. It is most likely the case that the amount of the current year is major to the past one (the reason for that is related to the impossibility for the system to grasp each single typology of clients mobility within the system). To make them fit at the beginning of the year, in that District they stored the surplus in a specific stock. During the year – in case they miss some clients in specific grouping – they simply draw on those stock to make data match. That is the reason why they called it 'countervailing stock'.

This 'un-ethic' workaround is then useful to maintain the integrity of the system and to manage the residuals, accordingly with the uselessness of a much more focused inquiry on data mismatch.

7.5. TOGETHER WITH THE OBJECTS

During my presence in TAR District, I spent an afternoon following a social worker (Greta) in NIM, one of the municipalities of the area. Well I remember she was all alone in the office and there was no one in the building, too. The office was in the basement and the weather was awful, with heavy rain and thunders. So to say, it all seemed a little bit grim. Aside from this person al feeling, I was there because she planned to spend some time on DSF, and we scheduled an appointment. Indeed, she explained to me, she usually take some time for working on data and, luckily enough for me, she had to check and update Homecare Assistance data in view of MSAD implementation. To me, it has been one of the most interesting moments of the research also thanks to a question I posed her at the end of the day, when she already turned the PC off. I asked her, as a kind of balance, a provocative question: "***Did you worked all alone today?***". The provocation was pretty clear since just an homecare assistant came around for few minutes during the whole afternoon. She answered in tune with this evidence:

"*You see, it's just two of us here! True the homecare assistant paid visit to me, but she didn't really worked with me…we talked about a client…*"[156] (Greta, T/A)

Obviously, I expected such an answer, so I immediately made a counter-argument asking her to pretend everything she 'employed' in the afternoon had a personal name, to treat tools and events as they were people. Then she grasped the provocation and rode the metaphor by starting to tie connections between what she did, the objects and the happenings she encountered, and the reasons for them to have a part in the performance of her job. Some of them accidentally crossed her activity, not specifically inherent to what she was doing but surely shaping how she did it. In particular, a lot of clients and colleagues phone calls interrupted her, turning her attention away from her attempt at working on DSF data check. By the way, although accidental, those happenings took her a lot of time; at the end of the day she actually ended up by saying: "*Did you see? I called you here to watch me working on DSF and all I could do is to check just four clients folders in a day…!*"[157] (T/A).

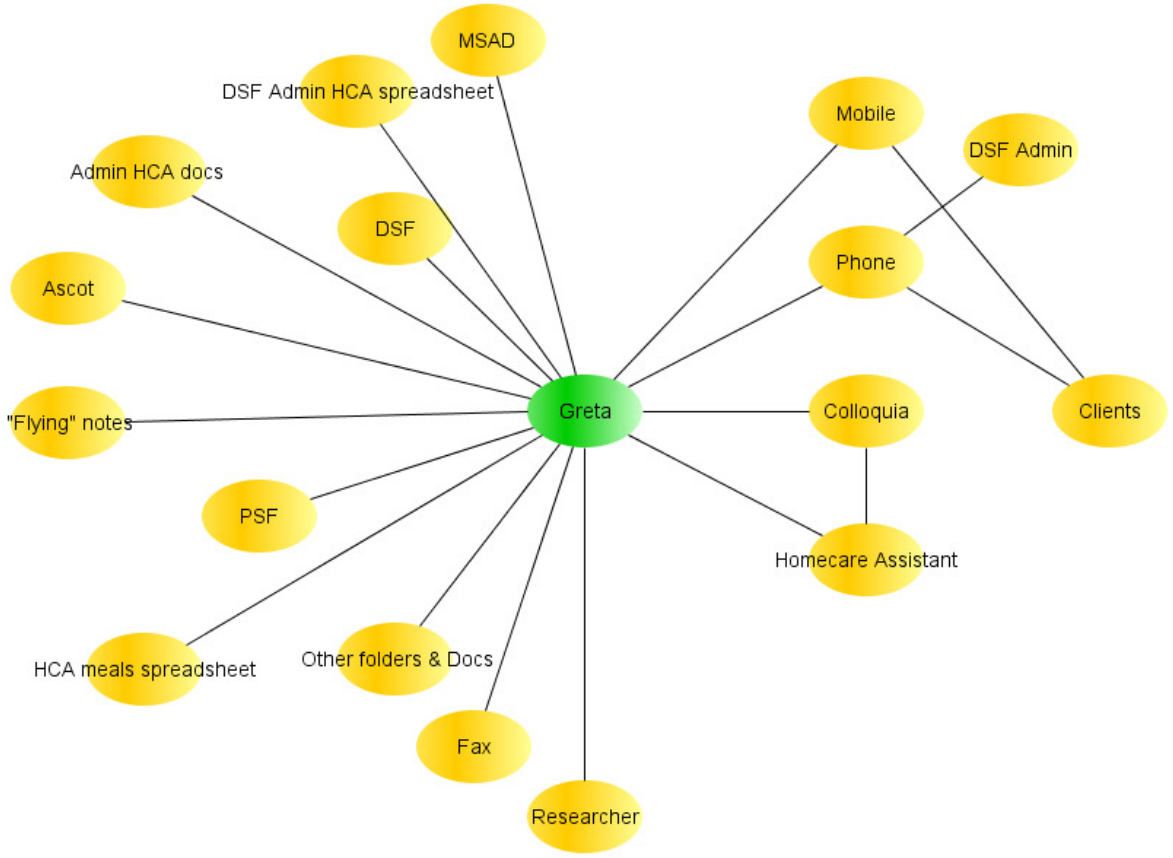
Anyway, she was already committed in the game I set up, so she carefully cited each and every element encountered. I firstly let her go with the flow, then I entered the game by pointing at

[156] "*Beh, come vedi siamo solo io e te qui! Sì, è passata un'assiste domiciliare ma non è che abbia lavorato con me…abbiamo parlato di un caso…*"

[157] "*Hai visto? Ti ho detto di venire oggi per vedermi lavorare sulla CSI ma sono riuscita solo a controllare quattro cartelle in tutto il giorno…!*"

specific things she did not mention. The picture here below visualizes the assemblage that rose from her reconstruction.

Picture 9: Objects, people and events crossing social workers activity on DSF (TAR HCA data case)



Once again, the picture provides a static and partial idea of the texture weaved during that specific activity. Links should have been tied among all nodes, highlighting the differences among them, the directions, and still it would not be enough. The point is that is impossible to visualize the network of actions accurately and exhaustively enough; although the picture helps to more easily grasp the complexity of sociomaterial environment, it needs a narrative to sustain it.

Let me begin from the 'centre', in which I posed Greta, although it would be more adequate to put the interaction between her and DSF at work, being it the focal point. Nonetheless, the aim of the argumentation is to reconstruct the various elements around the human actor through which the action took place. I kind of clustered the network putting on the right side whatever entered the action as 'noise', on the left the elements of the sociomaterial assemblage enacted and me in the middle, acknowledging my presence and the active role it could have played. I have been anything but neutral.

Greta's job was to 'adjust' data according to the requirements imposed by MSAD[158] module. She thus had to (re)enter homecare interventions for each client she had in charge and specify the type of intervention, the frequency of homecare assistant access and the funding institution.

Looking at the network from above, we might state the major part of the object acted as a source of information. Indeed, Greta searched for data from multiple sources, each of them providing a bunch of information to be then reorganised within fitting schemes.

The first document she browsed was the **spreadsheet made by DSF administrator** (Cécile). As mentioned in the former chapters, Cécile was rectifying all HCA intervention stored into DSF so that MSAD software could read them. She tried to accomplish this task together with MSAD administrator and a District administrative employee. Unfortunately for them, they did not succeed in recovering everything, so that Cécile designed a spreadsheet organized according to the organisation of DSF HCA intervention. She then forwarded it to social workers, who might either manually enter data on paper and send it back to her or directly rectify missing values into DSF. That was exactly what Greta was occupied in.

Hence, she had to sort out all the clients folder that needed to be updated and therefore she picked up the **administrative employee folder**. The latter organized a cabinet in which she filed a form for every client in charge. Such a collection which was "[…] *very helpful because they* [clients, N/A] *are already listed in alphabetic order, so that it's easier to browse DSF*[159]" (Greta, T/A). Hence, this folder not only provided her with an update list of clients, but it was organised so to better fit with software organisation. Unfortunately for Greta, the folder was incomplete: indeed, it missed HCA meal delivery intervention because some municipal departments did not account for it as a proper taken-in-charge. Anyway, she already organized a **spreadsheet to file supplied clients data** (that she printed out for the occasion – an important detail the reader will encounter many times along this section), so that it was once again easy for her to recover the information she needed.

In all those three file contained *just the information they were designed to provide, not all the information one might need*. Therefore, to accomplish her job, Greta had to search further information about her clients. Whenever a social worker needs to investigate clients case, the first and absolutely unavoidable source is **Paper social Folder**. PSF is so important not only because - as almost all social workers say – it is handy and constantly updated, but moreover because it is the repository of the most intimate and 'professional' information. In order to know something about

[158] Software for homecare assistance management.

[159] DSF lists clients by surname in a dedicated search page.

the care process, social workers impressions, private colloquia notes and so on, it is there (and exclusively there) one should look. Now, to fall back upon PSF was twofold useful for Greta: first of all, DSF HCA intervention form requires data that are not merely related to 'what is provided to clients' but also to clients status (e.g. how many times Homecare assistant has to enter clients domicile is strictly related to clients problems, family care, community care, and so on); secondarily, since Greta was not used to update DSF day by day, PSF allowed her to work on other clients DSF's areas which might have been outdated.

Either stored into PSF or **'flying'** on the desk, we then find **social workers notes**: they are often used to communicate among social workers or homecare assistants and to pick up information during phone calls. Otherwise, they just need to write down the essential from whatever database or information source is not fundamental for practitioners to have at hand.

Other paper-based object which might encompass such a work activity are **fax communication**, which are still largely used to transmit complete documents (to scan them and send them in attachment is not very common, yet) to be validated or protocoled, and **other specific documents** such as laws, regulations, project plans, relations from other professionals, etc.

Anyway, there are also different digital applications and other database around. The risk to miss them is due to the fact they rarely appear, excepting from their *printed* form. I point it out because I think it is not only formally different to store data into an electronic spreadsheet *and* then print it for commodity purposes, but it either tells about the material culture of social work, which is indeed heavily 'anchored in the paper'. Anyway, following Greta I encounter **Ascot**, the registry database management system. It 'communicates' with DSF through the extent that the latter automatically picks-up clients registry and fills DSF forms. This technical solution is of extreme worth for social workers essentially because they spare time since they are 'just one click away' from DSF updating. Within the same District, a couple of municipalities use a competitor system called **Alley**, which provides more accurate and complete information but do not interact with DSF, causing work overload and slowdowns.

Finally, **MSAD** was enrolled, too, although not directly (she could not access the software). It was thus part of the action because to correct data so that they fit software's forms was the very reason for doing what she was doing. This evidence leads to reason on what is concretely involved in the action and what indirectly enters it. True, almost everything recalls 'second level' actors, which are not physically present but have something who speaks/works *on their behalf*. This *presence in absence* (Latour, 1987) expands the boundaries of what gets assembled in practicing technology at work.

The job Greta was performing was nothing but maintaining a DSF database portion: she was maintaining both the consistency of HCA interventions database and MSAD operability. She was doing it together with material artefacts drawn together on occasion (but of course not by chance).

Aside from this network who got assembled in practice, other sociomaterial elements came into stage and kind of 'interfered' with the development of action. Phone calls, colloquia, clients urgencies, they all entered the stage shaping the way in which things got done. They not only contributed to configure activity's time framing (in terms of interruptions, postponements, rush and so on) but they also modified the borders of activity: for instance, after the colloquium with the homecare assistant Greta 'earned' clients additional information which she then entered into client's profile.

Moving from the specificity of the case to more general terms, I might say that the reported combination of elements did not exhaust the complex range of actors (both humans and non-humans) encountered in the field. In each and every setting DSF use encompassed various artefacts who walk together with it. I can list them as follows:

PAPER SOCIAL FOLDER

"*after a meeting with client or with colleagues, if there're new information about him or her, I firstly store my notes of PSF, then in DSF. Actually, DSF is always filled copying PSF data. It never happened the opposite*"[160] (Vanna – social worker and area coordinator, T/A).

Thus, PSF works as the primary data source and it comes long before DSF recordings. It is lived as something owned by social workers, an intimate space in which to translate the qualitative and professional aspect of their work. Hence, to update DSF they take data from what they found into PSF, copying just what they think it has to be entered. Indeed "*Regional Department and District manager have to know that I have that person in charge, what I'm doing with him or her, it's not their affair!*"[161] (Agnese – social worker, T/A). So, there is a process of *data selection* which is both led by DSF requirements (some information are not required) and the arrangement of technology-in-practice: what to enter, what not and how to enter what they want to be known according to technology's affordances.

[160] "*Dopo un colloquio con un utente o un meeting tra colleghi, se ci sono nuove informazioni sul caso, prima di tutto segno in CSC, poi in CSI. In effetti, la CSI è completata coi dati della CSC, il contrario non avviene mai*"

[161] "*La regione e l'Ambito devono sapere che ho un caso in carico, cosa stia facendo con lui o lei, non gli deve interessare!*"

When I talked about classifications workout, for example, I reported how social workers used Psycho-social Treatment (PST) intervention to record what Regional Management meant to be just on-the-spot counselling; that was an attempt of making their work visible thorough DSF, escaping the constraints of control (Bowker & Star, 1999). Anyway, to draw a narrower relation between PSF and DSF, I can conclude that ***DSF can not possibly survive the (older) technology it is called to substitute***. This goes not only because PSF is the source of data, but for more central practical implications, too. Greta herself told me she realized the usefulness of DSF as she started to work in different municipalities: to have DSF allowed her to get *basic* information on their client without carrying with her all the folders she could need. The same happened to Dalia (TOL social worker) when she kept commuting Districts valley's Health points. Despite this apparent merit, they could find basic information if and only if they had a network connection at hand. However, most of their work consists in moving from place to place without be connected (I am here thinking about meetings with other professionals and colloquia). The point is then that **PSF is *transportable*, whilst DSF is *potentially ubiquitous***, but it depends on cable infrastructure. So, in performing daily activities, both tools are irreplaceable one another.

ALTERNATIVE DATABASES

Under this label there is a mess of elements which differently encompass DSF at work. They could be either parallel running information systems or paper and digital data files.

About the first category, I already cited Ascot and Alley, both registry management databases, and MSAD, DSF add-on module. Across different District I variously encounter Insoft system (CDR), Gespeg (PN municipal management system), and other management systems designed for administrative purposes. All those got differently enacted in relation with DSF: some of them provided information to be entered into DSF, some others required data from it. I don't want here to deeply analyze each and every relation with them, but rather to state that they variously entered the data gathering process in which DSF plays usually a central role. They could either speed up or slowdown the work, depending if they mainly 'ask' or provide data and if they automatically communicate with DSF or not.

In any case, they rather remain at the periphery with respect to what we can call '*administrative material*'. It is a group of artefacts which comes from the District administrative employees, and mainly concerns the bureaucratic activity around clients pick-up. Those materials assume various forms: protocoled documents, lists, reports, and so on. The reader could encounter them as I talked about data checking activity, in which they not only played as source if information but also as

control devices. To understand their centrality I have to step back to how welfare system works: whereas social workers are charged with the care process, municipal employees manage economic supply, which most often match with the care process itself. The centrality of administrative material does not primarily consist in providing social workers with funding data, but rather interventions time-frames. Indeed, administrative procedures on monthly payments are accurately registered throughout the whole taken in charge. Hence, due to the nature of their work, "*administrative people have to be precise and their data always accurately update*"[162] (Vanna, T/A). Thanks to that, social workers have an 'institutional anchor' from which to reconstruct interventions development into DSF. No matter when client entered the service, no matter when social workers began to work on the case, into DSF the application protocol date is usually assumed as starting point and the intervention expires at the last grant payment. To generalize, administrative material is fundamentally enrolled either to ***maintain database and to configure the 'digital client' care process***, so to say the electronic translation of the real-world client, which nonetheless becomes something different from the people social workers relate with.

A third an even more central group of objects is constituted by all those lists, reports, spreadsheets, resuming documents and even access databases *set up by social workers* during their activities throughout the years. It is almost impossible to map all of them, most are provisional, made on occasion and inherently local, others are, on the contrary, more comprehensive and institutionalized. The most outstanding and structured example of those is probably MON's 'SSP' Access file, used there it is ten years. Under this label lie a 'root' database, which stores data from all over the District, and several 'derived' databases designed to account for special projects and modified according to their specifics. At the end of every year DSF administrator closes the file in use, she duplicates it, she transfers non-expired interventions records and store the others. During my participant observation she told me that, at the time they were about to design DSF, Regional Managers came along to analyze their working tool. The co-existence of SSP and DSF made practitioners to creatively arrange the two systems affordances in order to align them with workpractices. True, SSP was already aligned since it was designed on MON's work organisation, but then DSF got implemented and they had to bend and adapt those three elements, to harmonize one the others[163].

Moving from here to the wider regional system, I can observe how almost everywhere social workers kept updating specific files (mainly excel spreadsheets) *before* working on DSF and still

[162] "*Gli amministrativi devono esserci precisi, e quindi i loro dati sono sempre aggiornati*"

[163] I will further account for this particular case in the 'assemblages' section (See chapter 8).

relying on them - instead of DSF's research tool or BOWI - to find the information they need. Moreover, those files constitutes the main sources for data checking and important hints for DSF fulfilment. At the time of participant observation I was wondering why that mess of files (in which often neither social workers could easily make head) was so central in practice *instead* of DSF-related tools:

~ The most intuitive answer I got was that spreadsheets are customized, it is the practitioners who creates rows and columns according to your information needs. DSF organizes data in a standardized way, which often means 'good for anybody specific';
~ Moreover, DSF is *one* whilst you can have all the spreadsheets you need. That of course implies the information to be much more easily recovered;
~ Further more, they are the place in which social workers store both the information DSF does not requires and those they think it is better for the professional not to store into DSF;
~ Spreadsheets (and documents in general) can be shared among colleagues, they can be collectively reworked, updated and used to organize and homogenise local work and data entering practices;
~ Spreadsheets are also much more workable, for several reasons, such as DSF slowdowns, practitioners knowledge and skills about Office package tools, possibility to work offline, free access (whereas DSF requires different passwords for every municipality area) and so on and so fort.
~ Such artefacts much more easily 'walk around' the service: they could be sent by email, transferred in USB storages and shared among other professionals who might work on social workers clients, they can be handy disassembled into smaller pieces and reassembled on purpose;
~ Those documents have usually (although not always and not necessarily) a 'longer memory' in spite of DSF, which got implemented from 2004-2005[164];
~ Finally, in every report, spreadsheet or document I saw, clients are listed by name and surname, whereas DSF provided just code listed reports and consequent workability breakdowns (see chapter 7.4).

RELATIONS AND OTHER OBJECTS

Aside from these different data repositories, there are also other material artefact which encompass DSF work out. A privileged place is occupied by social workers relations on care

[164] Although is not so often the case, clients could be dismissed and enter the service once again even years later.

process. Often written for institutional communication purposes (to District's Majors Assembly, Civil, Criminal and Juvenile Court, and so on) they embed official data, time framing and evaluation. They are strictly personal, and they get enrolled in DSF-related activities from time to time. The same goes for professional relations coming from the outside (e.g. Health Department), official documents such as ISEE[165] paper, national insurance reports, and other bureaucratic forms from other institutions.

In conclusion, to acknowledge that DSF maintenance directly depends on how things get assembled in practice to be aligned and harmonized, means to account for all the different types of material artefacts that get variously enrolled. Indeed, DSF is not simply enacted in situated and provisional ways, but **it is enacted together with a various number and kinds of objects**. Those object play different roles depending on the practice in which they got assembled together with DSF, but in general terms I may argue that they get enrolled to 'cover' whatever can not be harmonized due to both DSF affordances and workpractices. **These object act as discharging elements for disalignment**. That is reason why I stated that DSF can not survive the technology it is called to substitute: DSF simply does not address different aspects of workpractices. Some of them already found their harmonisation into PSF, others are 'delegated' to other objects, each of them partially contribute to maintain the system alive by completing, substituting, overlapping DSF structure and affordances. Of course, it is not just a matter of DSF and social workers daily life. All the processes I have presented in the former chapters 'benefit' from the plurality of materiality: for instance, data checking activity would have been completely differently accomplished without BOWI, spreadsheets, Jasper's nominal reporting, etc. That means, all the activities that preserved DSF functionality and workability and contribute to maintain it enrolled in mundane activities throughout the years, they all unfolded in a complex sociomaterial texture.

To predict whether DSF could have worked in absence of those object or not is either hard and does not enter the aims of this research; from fieldwork experience I can only say it would have been different. Maybe the system would have broken down, maybe social workers would have worked out DSF in other ways, maybe the whole relational environment surrounding DSF use would have changed. Owed to this state of play, I can add a final remark about the **media**, and namely about materiality in social work practices: social workers themselves define their material culture as paper-based. Indeed, although I just finished to account for databases, spreadsheets, reports, and so on, I have to say that their enactment *passes through the printer*. There is almost

[165] See Note 64.

always and everywhere a lapse between the workout of those elements and the moment in which they get modified on the screen. In the specific case at stake, paper has a withstanding inertia. To acknowledge that shades a different light to digital systems maintenance and questions the notion of what is new and old about technology.

7.6. SOME TENETS OF MAINTENANCE-IN-USE

The last sections pertained the reconstruction of four work processes and the analysis of how object came into the phenomenon of keeping DSF alive in daily life. The empirical evidences supported the idea that information system maintenance is not a matter of code management, since such an activity never shown in the field. Far from 'cutting developers activity apart', fieldwork rather show the red line between DSF maintenance and the multiple system's enactments.

At the end of this chapter I can thus sum up the main topics emerged from the different sections; that will help to sort out some 'tenet' about maintenance-in-use.

From the very beginning of DSF analysis, I argued it could have been much more fruitful to consider it not as *the* technology, as much of practitioners account for it, but at plural. Such a plurality 'exploded' once I entered DSF structure to disassemble it: different subfolders, the coexistence of hundreds clients folders, the relational articulation among the different parts and the complex classification system, they all suggest to address DSF as a combination of elements rather then a monolith self-concluded tool. Things get even more complicated in light of DSF distribution, so to say the contemporary implementation in partially disconnected environments.

In chapter 6.2 I then described how such complexity entered social work world by following a practitioner through her typical working day. DSF, once enrolled in mundane activities, drew on both the logics of action and the way things got performed in the welfare system. Indeed, far from being a 'simple' clients accountability system, it entered the wider context of care planning, social policy making and the broader monitoring activity. According to the professionals engaged with the technology, DSF contributed to shape workpractices by enhancing the reflexivity of their work and redrawing existing connections among people, ways of doing and tying brand new relations inside and outside organisational units. DSF entered an already technologically dense environment (Bruni e Gherardi, 2007), densely populated by standards (PSF, spreadsheets, registry information systems, and so on) and media (paper, phone calls, fax, and so on).

Hence, the observation of technology at work sustained the argument of DSF as a system multiple. Plurality and distribution are indeed not sufficient to individuate multiplicity (at least in my perspective) if not enacted in practice. To look at those situated enactments differently developing in space and time constituted the basis for the analysis of DSF maintenance-related processes.

I argued that those four processes I sorted out from field data represented organisational attempts to preserve the multiplicity of the system by provisionally aligning it with the situated sociomaterial environments and, at the same time, to strive for the singularity of the tool, so to say to maintain DSF consistency at both District and Regional level.

This latter aspect is particularly evident in 'The Commission' activity, who negotiate DSF classifications contents immediately before and after its implementation. More generally about group working, all the encountered experiences represented institutional attempts of technology-work alignment, being them regional (the Commission), local with regional envision (PN group) or contextual (District plenary, area meetings). Such a multifaceted cooperative activity had three main 'outputs':

1. Postponements, so to say open aspects whose closure has been deferred in time for both accumulation (further implementations), abandonment (unsolvable differences hard to embed in system's structure) or homogenization (to reach an agreement before working on DSF);
2. System updates, in case decisions got directly embedded into the system: it happened mainly at the early stages but it decayed soon giving the way to various kind of deferrals;
3. Agreements on how to interpret and consequently use DSF. This latter aspect represented the more effective and profound aspect of what I called maintenance-in-use, that phenomenon of keeping systems alive in daily life who does not necessarily pass through technical modifications of technology, but inherently through its practical enactment at work.

The argument then focus on this latter topic, observing the process of DSF workout. Far from being just an adjustment of the tool due to technological affordances, it shone to be rather a deep reflexive process on DSF ontology, work, and technology at work. It is based on partial and situated workouts of DSF's constitutive parts: classifications and categories. Through the enrolment of those elements into daily routine, practitioners themselves questioned both their ways of doing things and technology's contents. This work on standards shone to be generative in the sense it did not solely challenged technology's structure, but it also stimulated to a deeper reflection on what working with technology meant and what kind of ontological and practical consequences it had.

To say those kind of processes to be inherently situated does not mean they are totally fragmented and self standing for at least three main intertwined reasons: first of all none reflexive process has such a short breath but it challenges the logics of actions underneath the combination of technology and professionalism, practices and organisational cultures; secondarily because contexts relatively far in space and weakly tied revealed to have shared ways of elaborating the multifaceted relations emerging from technology at work; finally because the broader network of DSF use 'benefit' from some *traits d'union*. I am here referring for instance to Jasper's role (District support programmer) and to data checking activity. Both of this elements specifically aimed at harmonizing the system *singular* while copying with the system multiple. Indeed, both of them pursued the goal of maintaining database consistency in light of the acknowledgement of situated workarounds, creative enactments and misuses.

Concerning programmer's activity, he represented a kind of 'middleware' between the regional management (and its logics toward technology) and local territories. In doing so he mobilized a shared language and knowledge background to make the work on technology smoother and the less problematic as possible. Error corrections revealed to be just a peripheral aspect of his work, which had mainly to deal with knowledge sharing, practices harmonisation, and the negotiation between the local and the regional.

Data checking, on its side, stimulated local reflexivity by claiming for a constant database updating. From the analysis of such an activity I could notice the impossibility of standardisation. *Plausibility and misfits acceptability* then took the place of that utopian criterion.

Finally I argued that all those activities could not possibly be accounted in terms of mere human agency, nor in the simple human-machine interaction. On the contrary, they are all performed with the contemporary and partial enactment of diverse objects and artefacts which entered the different webs of relation. They variously played the fundamental role of balancing the alignment between work and DSF, either completing the latter and deploying dis-aligned aspects.

All the evidences reported here and the articulation of my argument shaped the borders of what I called maintenance-in-use. It is mainly based on how technology gets enacted in daily life, but it also questions which consequences those enactments had in the contest of the system alive. It could be also drawn near to the concept of design-in-use (Bodker, 1999; Dittrich & Al., 2002), with which it shares the attention to the continuous process of post-implementation technology's workout. However, the term 'design' refer to me to the activity of software enhancement, and namely something based on code writing activity, whereas maintenance seems to have almost nothing to

deal with such an activity. Indeed, practitioners themselves use the term maintenance to variously indicate: a) the process of classifications update; b) data checking activity; c) Entering error correction. Stepping back to the traditional definition of maintenance, what emerges id that it is almost completely about modification of code, being it due to structural changes or bugs (Swanson, 1976). On the contrary, what I can conclude from fieldwork evidences is that *in this case study, almost nothing about keeping system alive deals with code writing*. Very little about the code has indeed been modified from the moment of implementation; even expired classifications continue to be shown at the interface, and the main programmers activity has been to fix data entered by mistake[166]. So, the major part of the work of keeping systems alive concern machine's alignment within different sociomaterial environments. Such a process is almost all about how the multiple system is enacted: to share the meaning of specific categories, to use DSF for non-planned purposes, to work classifications out, to suggest how to record data, to check whether data are updated or not, all these activity *do not design the system, but they shape its meaning and enrolment in practice*. Pushing the argument a little bit further, maintenance, instead of continuously designing the system, could be rather defined as the activity of designing *the* use. Consequently, the relevance of technical personnel shifts *from being able to use computer language to the ability to translate from different languages* (Orr, 1996): from the practitioners to the machine and the other way round, from management to Districts and from place to place among regional territory. That allowed the technician to mobilize and get enrolled in a wider range of networks of action, being a kind of gatekeeper of diverse processes. He acted a central role in maintenance-in-use (being him 'in the middle') because of his ability of keeping things together so to make the work smoother. Indeed, the reconstruction of the diverse processes I just finished to account for does not report maintenance in terms of system performativity, but rather of workability. To keep system technically operational does not seem to be a big deal.

Taking a look at how things got done in the field, group work revealed to be a kind of recurrent pattern. I do not obviously refer just to 'The Commission', which represented the institutionalized collective for system design, but better to the numerous meetings, plenary, area group in which things got arranged in shared ways. Those cooperative attempts of negotiating system-at-work represented to me what is inherently social in systems maintenance. Considered that keeping systems alive is mainly a matter of negotiating things in practice, cooperation stated the prevalence of the social over the technical.

[166] For generalizing purposes, we do not take into account MSAD implementation, which is a rather specific case.

Moreover about what maintenance 'is precisely not', we might add it does not mean to conserve the status quo, neither to enhance the system. In spite of that is a process of continuous system rework, which do not necessary comes to make the system better, but maybe to make the system *fit* better. Indeed, as we acknowledged the system multiple, it consequently avoid to consider whatever changes as an enhancement for everybody, everywhere. Through which extent can the software be possibly enhanced, owed the multiplicity of interests, commitments, practices and arrangements? To me, the answer to this question has once again to be searched in the concrete system's mobilisation. Since there are not perfectly fitting solutions, to talk about enhancement is a nonsense.

Specifically addressing the issue of the system multiple, fieldwork shows how the singularity of the system is not just questioned in theoretical terms, but actually challenged in everyday life. Just in rare cases DSF got enacted as a whole; although DSF workout leads to question system's ontology (the system in its singularity), what gets practically enacted are always bunches of DSF, combinations of classes, timeframes, connections among the constitutive parts of the software and even just punctual data. Moreover, those situated enactments show off a constellation of different and perhaps contemporaneous assemblages which variously enrol combinations of DSF parts (and other artefacts). They do not follow the separation among different professionalisms, nor even spatial contiguity, but bring together everything fitting specific practicalities. I will further develop this topic in the upcoming paragraph; right from here is rather the case to highlight the implication for the research topic: maintenance-in-use can be seen as the emergent output of a plurality of different assemblages, each of those works out, cares and partially mobilizes the system. *The system multiple, enacted in diverse contest of use get hence maintained multiple wise.* In such a way the wide concept of maintenance-in-use embraces all the multiple uses *through which* the system is kept somehow alive somewhere specific.

From here, is thus difficult to narrowly individuate specific actors who carry on maintenance, neither it works to talk about professionalisms. Stepping back to this section's account, the reader might conclude that social workers are those who make the system run thanks to their enactments of DSF and despite the fact that they do not seem to care about it too much. Switching to other institutional professions, it pretty looks the same: policy makers might care about database consistency, programmers about code and errors, practitioners mainly about classifications and standards system. Such a point of view could have the merit to highlight the role of the so-called end-users (Ciborra & al., 1983; Karenborg e Stahlbrost, 2008) in the process of maintaining the system. However, it does not give justice to the complexity of the field. What it does is to partially make empiric evidence to fit into a pre-determinate professional and hierarchical subdivision of

labour. On the contrary, each minute DSF rework, workaround, creative misuse, agreement, and so on, is performed through the enactment of different actors – being them human or nonhuman – which are kept together for specific purposes and they act to align things in practice. I call those entities, following Suchman (2007), *sociomaterial assemblages*, and I argue they are at the core of maintenance process.

Some of those assemblages might be persistent and recurrent, others more provisional. Changes in their configuration might concern the actors enrolled, the ways in which things are mobilized or both of them. How actors get enrolled tells a lot about inclusion and exclusion, participation and resistances; it also challenges the notion of power, shifting the attention from the institutional hierarchy to how power gets into the action. Finally, those arrangements, who constituted them and how actors relate end up to define specific possibility for action (Suchman, *ibidem*), so to say, they are generative.

The following chapter will thus deepen this topic and focus on assemblages as fundamental analytical elements to understand maintenance-in-use.

8. MAINTAIN-ING AND THE ASSEMBLAGES

> "*Well, it's already the third HCA software we test here. I remember the first one, it was awful, it had been released by a software house from Milan …I don't remember how many times we had to go there and explain what we needed and how they should modify it so as to meet our requirements. No, no, we soon realized it was not worth the effort. Then we tested another one, but we dismissed it very soon for almost the same reasons, this time without loosing too much time on it. Finally Regional Management asked us to test a product which was designed to be anchored to DSF, so that we would have communicating tools to sustain our work. It has not been easy, to be honest. LM and me, we spent several nights here working hard to study how it worked and how to manage both data entering and workpractices so that it could be of real utility . I can assure you, it's the last time! There won't be a 'next one': either MSAD works, or we go back to paper again!* "[167] (BA – MSAD administrator, T/A)

I started this chapter on "maintenance and assemblages" with this quotation to complete a reasoning I already addressed in some sections before: analyzing DSF at work identified some good reasons for using or not using it . Since the whole structure of the argumentation here draws a very thick line between use and maintenance, those reasons could be taken as good reasons to keep working on the system. Nonetheless, this quotation also suggests that *to keep system alive is also due to the high costs of dismissal and substitution.* Practitioners in the case here above did not wait uselessly during the second test, they immediately understood that there would have been too much work to do on it for aligning it with the context. Maintenance costs revealed to be high, and even higher than a new design phase. Hence, it is intuitively understandable how 'throwing a system away' could be a much more economically convenient solution for an organisation (Avison & Fitzgerald, 2000; Nicolau, 2004). In spite of that, a lot of money is invested in maintaining the existing system. Why is this the case? The answer relies in the very same text we quoted here

[167] "*Ohu, è il terzo gestionale SAD che sperimentiamo qui. Ricordo che con il primo è stato terribile, era di una ditta di Milano…Non so quante volte siamo dovuti andar là a spiegare cosa ci servisse. No, no, abbiamo capito subito che non ne valeva la pena. Poi ne abbiamo provato un altro, ma l'abbiamo abbandonato quasi subito per gli stessi motivi del primo, ma perdendoci meno tempo dietro. Alla fine la Regione ci ha chiesto di provare un prodotto che era stato sviluppato per attaccarsi alla CSI, così che avessimo degli strumenti che dialogassero. Non è stato facile, a dirtela tutta. LM e io siamo rimaste qui a lavorar di notte per capire come lavorava e come gestire i dati e le pratiche in modo tale che risultasse utile. Ti assicuro che è stata l'ultima volta! Non ci sarà 'un prossimo' modulo SAD: o questo funziona o torniamo alla carta!*"

above: not everything is taken into account in the money cost of the system , like work and effort, for instance. . The entry effort spent in making the system operative, along with the work required to keep systems in tune with the organisation are often neglected variables, but they represent the difference between holding on to or giving up a system.

For all it has been seen in the field and accounted by practitioners, we could conclude that implementing a system primarily requires an initial work effort, and a lot of work to preserve it alive, all this long before considering the funding to support it. Hans, the DSF designer, told me that "*we set up a web-based application precisely to avoid going on the field…you know, there are also economic consequences… when I move I cost something like 500 euro per day to my organisation*"[168] (T/A). So, the work needed to make system operative is at the same time a good reason for keeping the system in tune and for avoiding a new design phase.

However, to maintain the system is not a shared organisational goal, so that it is somehow hard to reconstruct a unified account of maintenance-in-use. As it is rarely an explicit goal of the work, no wonder if just few among the observed and interviewed people talked openly about 'maintenance'. Practitioners narratives did not help in this respect because they rather talked about 'errors corrections', 'classifications re-elaboration', 'database consistency monitoring'. It is true, however, that somewhere in the field the issue had been directly addressed by operators themselves, who accounted for maintenance in terms of the process of keeping the system as close to reality as possible (see Chapter 7.2). This definition distinguishes itself from the traditional way of conceiving the task of keeping system operational. At the same time it sustains to look at the combination of the activities analyzed in the latter chapters as constitutive parts of the more general process that we called maintenance-in-use.

Through the developed argument I acknowledged that, both theoretically and empirically, the system is not monolithic but rather an articulated and plural software distributed in space. The diverse enactments of this software in daily life identify the system multiple. After exploring the reasons why DSF is maintained, the evidence of the system multiple questions what is to be maintained (and by whom). Indeed, as long as DSF is never enacted as a whole, it consequently gets maintained in multiple ways. So we can reframe the question not in terms of "who benefits from having an operational DSF? ?" but rather "*who benefits from the different parts of DSF so that it is important to maintain them somehow?*". The answer requires, in my understanding, the

[168] "*Abbiamo fatto un'applicazione web proprio per non dover andare sul campo…sai, ci sono delle implicazioni anche economiche…quando mi muovo, costo 500 euro al giorno alla mia organizzazione*"

consideration of the logics of actions each different social group carries on and tries to achieve in practice.

Narrowly looking at what emerged from the field, I can see that also Regional management and consultants, which are institutionally charged of the DSF implementation, primarily 'care' about the *consistency of the database for policy-making purposes*; they are aware of the variability in software use across the territory and they stand it as long as it does not invalidate the singularity of the information, taken as a whole. In doing so, they stimulate data checking and organized group work in order to try to keep interpretations of classifications as close as possible one to the other and with respect to the guidelines. These activities have been designed so as to avoid practitioners' overload, too, because they realized the fragile equilibrium on which the combination of both their aims and the practitioners' ones relied in practice. Although in the early stages (see Ch. 7.1) Regional Department directly aimed at negotiating agreements on the general classification system, in the latter period (see the data checking activity, Ch. 7.4) they much more focused on specific projects which found a translation into DSF. Also in this case DSF is not considered in its totality but is rather transversally cut into pieces, the tuning of which became central for the regional administrators in charge.

Such an equilibrium shown up to be heavily based on the activity of the 'middleware' people, namely the support programmer and DSF administrators. The first was charged with supporting District in errors correction and bugs fixing, that meant to make sure that the database faithfully translate territorial situation without being affected by systems bugs. In addition to his institutional duties, he helped social workers by making their work smoother and easier, he took control over recording practices' variability on behalf of the Regional Management, he covered 'acceptable' workarounds and supported some of those creative enactments of technology at work. From being responsible for preserving the database consistency, he turned to act towards the preservation of DSF consistency at work.

The DSF administrators, on their side, took charge of keeping *local* database consistency in the contest of their colleagues practices. Most of the administrators also tried to educate social workers to a more aware use of DSF in terms of a tool for programming and monitoring their activity on clients. More than everyone else, administrators undertook the ambivalent vision of the DSF: a recording device for policy making on the one hand, and a professional supporting tool, on the other.

Differently to the higher hierarchical level which aimed at maintaining data significance through the prescription of 'how to do things', both these 'middleware' people maintained the consistency of the DSF at work *through the practical translation of multiplicity into singularity*.

From the social workers point of view, the problem is even more complicated. As most of practitioners pointed out, they generally miss to step higher than the implications of DSF in their daily life. That is to say, they miss to take into consideration DSF relevance for organizing the welfare providing policies, both at the District level and (all the more so) at the regional one. They just recently began to use the software for managing their care processes. Owed to that, what should they be interested to maintain about DSF? I argue, the answer is twofold: on the one hand, they are concerned with the relation between the visibility of their work and the control that supervisors might have through the reading of DSF recordings. Therefore, they try to enter the information so to make their workload visible without showing what is inherent to the care process. On the other hand – and perhaps more interestingly – they try to maintain the consistency between the *real client* and the *'digital client'*. In other words, to translate (in shared ways) both the account of clients problems and the interventions set up to face it into the digital form, without being out of touch with reality . In order to reach such an equilibrium they 'play' with DSF interventions' time frames and they work classifications out.

Briefly summarizing, Regional Department and consultants addressed the problem of maintenance in terms of the harmonic articulation of DSF parts, by trying to preserve database consistency. The work on classification they performed during 'the Commission' specifically aimed at harmonizing the recordings rather than taking into account DSF situated enactments as attempts of aligning it with the workflows. Despite social workers' critiques, they played a fundamental role in keeping DSF uniformity across the territories.

Programmers and DSF administrators mediated this more general need of consistency and the situated use of the technology. However, they moved following rather different aims. Indeed, DSF administrators strived for homogenising DSF uses *within their territories*, taking care of *local* database consistency. In doing so, they reframed Regional goals by primarily taking care about dataset 'fitness' with the local workpractices, with the aim at enhancing District's policy making and educating social workers. Indeed, it is in this contest that social policy's and social work's boundaries blurry in the daily work on clients.

On his side, the programmer tried to translate different languages and different DSF ontologies (work supporting tool, statistical device, educational instrument). Being the referent for technical

problem he soon turned to support social workers also from the methodological point of view. In doing so, he played a fundamental role of knowledge sharing.

Finally, social workers' activity mainly dealt with working classifications out. It was precisely at the classifications' level that DSF encounter their professionalism, and they contribute to system's maintenance by the keeping its constitutive parts in tune with '*the turbulent reality they lived*'[169] (Mathilde – District manager, T/A). They either worked them out specifically addressing one of them or groups of them, putting classifications in relation with the care processes and with the standpoints of their profession.

To describe the articulation of maintenance's work in such a way, may gives the reader the idea that the subdivision of labour follows professional boundaries. However, things become much unclear shifting from the question 'who maintains what?' to 'how things get maintained in practice?'. As I had already the occasion to point out, the latter is a matter of how things get mobilized and assembled: professional communities' boundaries blur, and the focus to the combination and interaction of different practices. In other words, to maintain a system is a matter of how things are assembled in practice. In order to grasp the implications of such a perspective, I think it would be the case to come back to 'sociomaterial assemblages', where this concept comes from and what is worth for our case study.

In the final chapter of her 'Human-Machine Reconfiguration', Lucy Suchman draws a research agenda for the upcoming study of information technology at work, putting forward an alternative perspective on human-machine interaction which '*takes persons and machines as contingently stabilized through particular, more or less durable arrangements* […] *The point in the end is not to assign agency either to person or to things, but to identify the materialisation of subjects, objects and the relation between them as an effect, more or less durable and contestable, of ongoing sociomaterial practices*' (Suchman, 2007; pp. 285-6).

As long as I understood the argument of the author, it means to shift the attention on the performance of the action as it unfolds in the combination of humans and nonhumans actors. Through this extent, topics such agency, responsibility and generativeness of doings reside on the intra-relation going on inside what she called 'sociomaterial assemblages'. The accountability of such a performance it is no longer a matter of authorship (human or machine?) but rather '*a problem of understanding the effects of particular assemblages*' (*ibidem*, p. 285).

To talk about such entities means to reflect on the problem of agency, first. Stepping back to Chapter 7.5, I recall the little game I did with Greta in order to recognize in the field what are the

[169] "*la realtà turbolenta in cui viviamo*"

implications of Suchman's argument. Greta was working on Homecare Assistance (HCA) data update. In doing so she deployed a number of object which supported her activity, pinpointing an arrangement of people, artefacts, objects and events. Other came into stage along her working afternoon, so that the unplanned interruptions prevented her to accomplish things as she scheduled, showing off the unpredictable part of the action. Hence, some object got mobilized, others left apart. Which kind of things get mobilized it is largely a matter of which are the most relevant for the performance of the work (Goodwin & Goodwin, 1998). However, other object entered the action 'by chance'; whatever the plan was, they entered the performance of action and undoubtedly contribute to shape it.

To reflect about agency in the perspective proposed here not solely implies to acknowledge the symmetry between humans and nonhumans in shaping the action (Callon, 1991), but to question *how* the work unfolded through the specific interactions between the two and which consequences it carries with it. Those consequences are the generativeness of such an arrangement: how things unfolded and whatever followed it is the consequence of that arrangement, and just of that one.

With regard to this, I argue that field data allow an interesting exercise, and namely to work by subtracting. In order to catch the implications of the assemblages, it could be useful to cut out one of the elements enrolled and try to account for how things would have been in its absence. I draw back to Greta's case and take the HCA folder set up by the administrative employee as an example: HCA clients files, comprising a minimal set of data, were stored (all in the same place) in alphabetic order. Thanks to that, Greta could easily browse them, pick up handy information and digit them into DSF. Without this artefact, she could have retrieved information from her HCA spreadsheet. Therein, she would have found different information but not all of them central for what she was doing. Hence, she (most likely) would have picked up several PSFs from her archive and browsed each of them in search for the information she needed. Yet, it would have been impossible if she was in NIM office, because she did not usually take with her the entire archive when she came on duty outside her office of reference in ATT. Consequently, she would have been either in delay with DSF updating, putting off the implementation of MSAD or she would have arranged thing not to slow MSAD procedures down.

This example I proposed, it is clearly representative of the argument I am pushing forward, although it is just one among tens I could have cited here. They all show how the different processes I analyzed in the former chapters are inherently constituted by combinations of elements which do not necessarily and univocally enter the activity but that 'earn citizenship' as they are mobilized in practice.

I argue, there are more or less stable mobilizations within different assemblages who remained present in time, whilst others changed around them. The relation with PSF is one of those *assemblages that remains present* in time and space, although it is differently mobilized in almost all the maintenance-related activities: browsed as data source, filled with information which should not enter DSF, taken as a starting point for DSF classifications reworking, and so on. Through a large extent, I can say DSF maintenance relies on this social workers-PSF combination at work. If a contest was deprived from PSF, most of the evidence risen from the fieldwork would be totally different.

Aside from this, also the *way in which things get mobilized* can somehow stabilize, whilst what is mobilized changes. If I think about the enrolment of different spreadsheet into diverse activities, no matter how the information is organized, no matter the topic, no matter the process, they are always put in action by first of all printing them out (which we might all agree is not always necessary, nor the most 'rational' thing to do).

It could be either the case things get assembled together and reach a provisional stabilisation or that the network gets dis-assembled and different parts get re-assembled. BOWI implementation, for instance, pursued the aim at discharging Jasper from providing reports and at stimulating responsibility and reflexivity among the Districts operators. In the original version, BOWI was not provided with the nominal reporting tool, so that it was pretty useless for social workers' daily life. To have a code-listed report implied to loose a lot of time to sort out clients, so that the social workers continued to ask Jasper to provide them with most suitable reports. In this case, although BOWI got enrolled in other activities such as policy-making projects monitoring, it did not found its place within the arrangements mobilized for database consistency's maintenance. Once the call centre substituted Jasper, Regional Department decided to implement nominal reporting into BOWI, so that the former arrangement decayed and things got assembled once again. This turned things much more into the Districts' context, differently from the former combination which implied Jasper to take connection between the local and the central. An other example came from PN classifications reworking group: interestingly, as the members reflected on how to modify categories, they just partially relied on how they practically tinkered with the different classes, but they often went back to the original formulation of DSF manual.

Nonetheless, it seems that also the assemblages who did not reach a provisional stabilisation, they did not cessed to 'act'. They represent an attempt to organize things together which did not worked and, as such, they individuate *how not to do things*. Hence, no matter the 'degree' of stabilisation the assemblages acquire, they are nonetheless generative for further developments,

either enabling them or holding them up. They shape the course of events through the possibility for action they allow and stimulate. MON's handbook, for instance, entered a structured but partially misaligned contest of DSF and workpractices: the overabundance of classifications hardly fit with social workers' needs, so that they decide to pick-up the most relevant classes and draw them together in a brand new artefact. Before that moment, practitioners had to mobilize the entire classification system somehow, whilst by enrolling the handbook they related with what became 'their system'. From that moment on, everything connected to data checking, database updating and even internal processes came to life through the brand-new assemblage of social workers-and-the-handbook. DSF did not disappear, but it just got mobilized otherwise: the classification system entered the action when the handbook was not enough to address social workers' needs. Yet, that was not referring to the work anymore, but rather to the work-with-the-handbook.

The reiterate mobilisation of those arrangements in practice hence shaped the practice itself through the reflexive process it enhanced. Through this extent the enacted relations (re)created the way in which things got done and both the reasons and the meanings for practitioners to act in that way. For instance, as long as it is impossible for practitioners to conceive their work without PSF, so I argue it is with DSF and the assemblages around it. Indeed, most of social workers said me that to cut DSF off from their work would not have changed anything, but the evidences of my observation told exactly the opposite. What I caught was that whatever they were doing was heavily informed by their reflexive encounter with the technology; the work became the work-with-DSF. From this acknowledgement I could explain most of their activities, languages, relations and order of justification that came into stage. Perhaps partially but effectively for sure, DSF entered social workers practice(s) and, being enrolled it shaped the ways in which the work was done. This is particularly evident with respect to the monitoring process both at the projects' and at the clients' level: the vocabulary changed along with the ways in which they accounted for their work, the relational environment, being it enriched or restrained, awaited a modification on how it was lived (see, for instance, Jasper's case on Chapter 7.3).

Hence, the problem of maintenance is not a matter of keep on working on the system or not, but rather in *which ways system's enrolment into everyday practices is preserved and how the technology is kept relevant for the work*. To be relevant does not solely and necessarily mean 'central', neither 'useful', nor 'functional', but also 'unproblematic' and 'acceptable'. It is slightly different from 'being taken for granted' (Orlikowski, 2000), because the system is rather continuously reworked; much better, DSF's relevance shown whenever technology got enrolled in the reflexive processes of daily work.

Deriving from this, maintenance-in-use can be seen as the result of different mobilisation in the context of workpractices. As pointed out in the first part of this work, practice could be defined as a rather stabilized and socially recognized way of keeping heterogeneous elements together in time (Gherardi, 2006). According to the field experience, maintenance-in-use encompasses several practices, most of them overlapping in space and time. Indeed as I already extensively documented, technology's enactments occurred multiple wise across territories and differently over time.

However, once granted that these mobilized arrangement are fundamental to understand the basis of keeping systems alive, I think it is rather reductive to simply rest upon this acknowledgment. On the contrary, to achieve a much more complete comprehension of maintenance, I think it is necessary to look at those assemblages *combined*. In my understanding, it means *to look at what flows and what does not in the context of interactive practices*. Indeed, a lot of elements (both people and objects) are recurrent among territories and more or less persistently kept together. Yet, their presence in itself does not tell too much; in spite of that, it is how they are mobilized that is fraught with meaningful consequences.

To move from a place to another are people, things, and ways in which things get done.

People move and people commute.

Most of social workers do not stay in the same place all their working life long and rarely they get employed in the place in which they are trained. When they move, they bring with them ways of doing learned in the contexts in which they worked, and perhaps they try to reassemble those practices in the arriving place. Talking about classifications working out, Noemi (social worker, member of PN workgroup, see Ch. 7.2) recalled her experience in an other District, bringing into stage the possibility to have a more precise definition of pick-up starting time: where she was working, the administrative process started just once social workers provided a document which proved that they opened the client's DSF folder. In such a way, they first of all shared a recording criteria, and secondarily they entangled DSF in the workflow, assuring that it was constantly updated.

Also when they are employed in a specific place people commute; they enter different contexts (no matter if physically commuting or not). Taking once again PN working group's social workers as a reference point, during that working week they stayed in their office and met clients, they participated to different meetings both inside and outside their institution, they spent a working day with Regional Management and DSF programmers at the regional department's offices, they met up for reviewing DSF contents, they discussed the results in plenary, and so on. Jasper's case is also

indicative: during the time he was working as support programmer, he visited various workplaces, he organized *in situ* training, he kept in touch with several practitioners on a daily basis, he participate to Regional Department's and 'The Commission' meetings, etc. .

People who move are people who enter different practices during their working experience and, in doing so, they enter different networks of relation in which they are differently enrolled together with different objects and artefacts. In other words, they take part to different assemblages.

About *things which move*, during the participant observation I could follow tens of objects and artefacts which 'jumped' from a place to an other.

With reference to an information system, the most trivial evidence is that data flow. From the input point to the regional servers, data await different dissections and gets pieced together till they go back and/or spread around, variously recombined. But data is just a little part of what moves in DSF-related activities: almost everywhere reports moves from the management offices to social workers and all the way back, back and forth from the organisational outside to the Districts, from an office to an other and from an institution to an other. It happens almost the same to the spreadsheets, assumed to their more general extent of frames for organizing data according to the different situations. Yet, in my opinion the most interesting example of 'things that move' is the digital folder. One of the acknowledged virtues of DSF is the possibility to automatically transfer a client's folder from a social worker's account to an other. Consequently, when the real clients moves, it is easy for the digital client to follow him. This rather simple evidence has important implications for the argument. Indeed, what comes into the new setting it is anything but a simple folder. On the contrary, it is the folder as it rose from the combination of clients, practitioners and technologies at work. As they move, objects carry with them the consequences of having been enrolled in a way better than an other. Moreover, if practitioners send the folder, it means that they are sure it will be intelligible in the arrival place. This possibility relies on the capacity to decode the information coming from the sociomaterial assemblage of origin. If the social worker who receives the folder reads that the client had a socio-psychological treatment, she understands that the client did not need an intensive care, but rather some punctual colloquia from time to time. If among the interventions stored she finds an intervention called 'domiciliary support', she acknowledged that the client earned some money to pay the rent. Such an understanding is made possible thanks to the common ways to work the system around, so that the use of a category that should have been used for something else (according to the manual) immediately transfer the information given by DSF at work.

Therefore, something else should have moved parallel to the folder. To implement DSF Regional Department highly focused on *vocabulary and language*. Regional manager immediately acknowledged that, "*without an agreement on what we're talking about, we wouldn't have gone anywhere*"[170] (Brunhilde – Regional manager, T/A). To point out the difference among 'treatment', 'support', 'counselling', and so fort, has been the base for sharing a common language among all the Districts. True, classes definitions are always questioned, but they are questioned on the base of a shared way of talking about them, labelling and defining the interventions. About this process of language sharing and definition, I argued, it did not take place in a vacuum, being it based on PSF categories' review. This evidence bring into the temporal dimension of flows, which not only moves spatially but also temporally.

What flows are then people, objects and languages. Most importantly, those elements move *together with the socially supported way of doing things*. To state that the more general phenomenon of technology's enactment is inherently situated did not show it to be disconnected among the places in which the system is distributed. Talking about classifications' working out, for instance, the comparison of the different fields evidenced some commonalities among Districts: to enter a twelve months-lasting intervention to record specific professional services which do not imply to clients' taken in charge is an outstanding example; an other one is to record people who receive a grant aid for rent payments into DSF, no matter if the client ever met the social worker[171]. To choose among different options is the consequence of the attempt to align classifications so to preserve the equilibrium between Regional Department's necessity of control and social workers aim at making their work visible. This dynamic shown to develop in rather common ways across the whole regional territory. Besides that, other practices are rather recursive and distributed (see Ch. 7.5): one of those is the enrolment of paper-based artefact in almost all the maintenance-related activities; asking data to the administrative employees to set the DSF interventions' timeframes is an other shared way of setting the digital folder in tune; furthermore, referring to Jasper's reports instead of doing it on their own, avoiding to directly communicate DSF problems to the Regional Management, and much else besides.

Hence, things move in space and time, but most importantly for the research they never move alone. What emerges clearly from the reconstruction of the processes at the basis of maintenance-in-use is that *things moves combined and assembled*. For example, when DSF classifications are

[170] "*Senza una condivisione su ciò di cui si stava parlando, non saremmo andati da nessuna parte*"

[171] This recording practice serves the visibility of the work, considered that the more recorded clients you have, the more you worked.

questioned, they are not questioned as ethereal objects but as they are mobilized in practice. The example of MON's handbook is once again illustrative: I argued it represents a 'closure' of DSF at work, the assemblage of DSF categories, social workers knowledge and practices, clients care experiences and shared meaning and languages. All together, they became the touchstone for further reworking.

Therefore, in order to deeply understand maintenance process is worth looking at *when and how assemblages flow*. As an example, the client folder's transmission is not simply a matter of an object that moves from a place to another, but rather the combination of the real clients and their digital translation emerged from how technology, work, care and knowledge got mobilized in the place of origin and then kind of frozen into an artefact that will be disassembled and re-mobilized in the contest of the arrival practices.

Hence, things flow combined. Most importantly, they flow carrying with them their *history*, all the situated encounters that shaped the way in which it got more ore less stabilized. Owed to this fact, I argue that each movement and each mobilisation make the assemblage different from itself, shaping the possibility to disassemble, rework and enact it differently in the historical development. Thinking about 'The Commission', the activity began from the acknowledgment that PSF classifications were already outdated (see Ch. 7.1). This was not due to a bad design, but to the fact that they got multiply enacted over time in different assemblages which shaped their alignment in practice and made their closure out-of-date; once the possibility to question their closure occurred, the classifications-in-use got re-assembled in relation with the renewed technological affordances and gave life to the DSF's classification system, a brand-new entity to be enrolled in the diverse practices.

Episodes like PSF's reworking exemplify what I understood to be the *generativeness of assemblages* (Waterton, 2002; Suchman, 2007; Ch.15): to mobilize different elements in diverse ways and places, it generates new possibility for action. With such an idea in mind, what I am going to do is to draw the connections among the different activities which sustained the maintenance process under the light of sociomaterial assemblages' flows. I will build the argument on two important points:

1. Considered that each and every different assemblage is mobilized in practice, to look at them means to talk about interactive practices. Such practices are not encaged within the borders of professional communities but they differently cross them; professionalism is not a stable characteristic but just one of the mobilized elements. Probably, the most outstanding example of such an argument is what Jasper called 'methodological support': the situated ways of data

recording, shaped and sustained by contextual enactments of technology, got enrolled with his skills and aims, informed with both the prescriptive ways of data entering and those he encountered.

2. What flows is not always and not necessarily the 'entire' assemblage but just parts of it, depending on the activity and the aims underneath it. Two cases I observed made it leap at me, they both tell the story of how totally different trials can lead to a uniform outcome: during the second week in the field I participate to a Provincial Welfare Observatory's meeting. There, all the District representative met up to discuss on what the annual special issue should be focused on. The topic was critical because not all the DSF information were trustworthy, Homecare Assistance (HCA)'s data in particular. Practitioners agreed to use the diagnosis recordings, but almost none of them were disposed to transmit the related funding reports. Indeed, all of them stored data according to Regional Department's requirements, but there were ten different ways through which they accomplished that task: some of them asked data to the cooperative, others drew them out from specific software or 'homemade' files, some others queried Homecare assistants. Everything about HCA data recovery was different. Although it caused problems in that occasion, it was just thanks to that that it could flow and be recombined into a more general assemblage. Similarly happened for the accountability of disabled minors. Either TOL's social workers and MON's administrator swore that their data were absolutely reliable. Their alignment with Regional reports stood actually as a proof. Curiously enough, a similar state of play rose from totally different ways to assemble things in practice: in TOL case, data were alright because they used DSF printings as an official document for the Minor Court and other institutions, whilst in MON they were updated because of an internal procedure that did not allow to pick-up clients without 'demonstrating' that they already have an open DSF folder.

Once assumed that maintenance process is based on software enactments, it has been interesting to see the complexity of arrangements around its use.

Thinking about DSF alignment with workpractices, for instance, the research finding show how the contemporary enactment of PSF, inter-professional relations and other systems of data storage allowed to sustain DSF workability. Indeed, the mobilisation of all those elements granted DSF 'survival' because they compensate DSF misalignments and soothed the effects of its affordances. Moreover, those object served to sustain social workers professionalism by preserving their privacy from supervisors' control over the care process' development. Thus, common needs led to recurrent situated workarounds across the regional territory, meaning that sometimes the encounters between

technology and the stabilized arrangements of things followed some common lines. This 'complementary' enactment of several object show how, whenever the affordances of technology became too restrictive, then the enrolment of other elements became unavoidable to make the general arrangement working. Connected to this, the 'comfortable' translation of the work into DSF categories and frames generally passed through the partial and creative enactment of system's structure. Also with reference to this aspect, similarity among the different settings can be noticed, showing that those more or less stable ways of mobilizing technology 'moved' in space and time.

An other outstanding example of arrangements that draw a red line among specificities is the methodological support provided by Jasper (see Ch. 7.5). The communication between practitioners and Jasper mainly rested upon the mutual acknowledgement of how things were performed. The added value of the programmer (differently form the call centre) was the awareness that he was not dealing with DSF categories troubleshooting, but rather with those assemblages represented by categories-at-work. Obviously, it did not mean that Jasper knew by heart each and every single practice, all the elements enrolled within and how they were specifically put into stage, it was sufficient for him to know the main patterns of DSF enactments to understand the problem and even suggest emerging solutions. From the Districts point of view, this relation with the programmer not only helped to spread a more homogeneous understanding of classifications-in-use but, in doing so, but it also put them in connection with other elements which contributed to shapes arrangements and ways of doing; in general terms, Jasper made pieces of assemblages and way to assemble things to flow from a place to an other, even contributing to their re-mobilisation in practice. When I was employed in PN Department, a social worker pointed out that "*I don't worry if don't understand technology and what the programmer says, because I know it's the same for him*"[172] (Gallia – social worker, T/A). Yet, what the empirical findings tell is exactly the opposite: through the longstanding interaction with the social workers Jasper gained, using Lave and Wenger's terminology (1991), the legitimacy to be firstly a peripheral participant, and then to be more and more recognized as a member of the enlarged community of practice. He became so central in performing specific activities that his presence in the webs of action shaped the ways in which things got arranged in the context of specific workpractices. Jasper's nominal reports, for instance, eased data checking: from being an highly time-consuming activity of paper folder browsing and lists compilation, it turned to be a 'simpler' check in which PSF got just collaterally mobilized. Such a modification in the arrangements enacted to perform that task became so stabilized that, once Jasper's contract expired,

[172] "*Non mi preoccupo mica se non capisco niente di tecnologia e di quello che mi dice il programmatore, tanto so che è reciproco!*"

Regional management had to implement a specific query into BOWI to preserve the affordances of the existing combination of things (with controversial results, though).

Hence, arrangements can be recurrent, arrangements can flow and, at a third stance, the elements enrolled can be the same but mobilized together in different ways. Indeed, I noticed that most of the arrangements tie connections among a determined number of objects and people, but mobilizing them differently from an activity to another. PSF is explicative in this sense: it is mobilized for preserving professional autonomy; it comes into stage as a fundamental source of information for DSF recordings and data checking; since it pre-existed DSF, it defined the touchstones for classification reworking; combined with some kind of nominal report, it stimulates the reflexivity of social work. Thus, PSF entered different assemblages, being recurrently mobilized differently from one to another. The point of interest is obviously not that performing different tasks implies mobilizing different things, but rather that noticeable persistency of combinations across spaces, times and activities. This suggests that some assemblages are persistent in the more general contest of supporting, taking care, enhancing and maintaining system's relevance in practice. Further more about persistency, I think it could be also interesting to look at it through the eyes of those 'middleware' actors represented by DSF administrators. Most of them do not use DSF directly (so to say, they do not enter data), so that what they mobilize in their activity is the assemblage of clients, social worker practices and technology affordances, that they take as a singular element. In doing so, through the re-assemblage of data mediated by BOWI, they enhance the process of reflexivity, supporting social workers in data checking and attempting at preserving Districts database's consistency. They also contribute to shape ways of doing by get in relation with the managerial and political actors that variously enter DSF related tasks.

The underlying idea is that assembling and reassembling things, being them persistent or provisionally enrolled, are not separated in practice. Each assemblage shown to have a memory, and this memory gets enacted in the further engagements. Nonetheless, this movement is not linear, neither specifically incremental. It is rather recursive, but never sterile. Things that are assembled together may be provisionally mobilized and then decay but they nonetheless shaped the way things got done, and in this sense they generatively played a role in shaping the action.

Coming to the end of the chapter, I can figure out the relevance of looking at assemblages for the phenomenon of maintenance-in-use. First of all, the system and its constitutive parts are multiply and differently enacted in the context of interacting practices. Some of them are much more concerned with keeping specific parts of the system alive, through the extent of 'relevant in

the broader contest of daily work'. It does not mean professional groups are charged of taking care about specific elements, because things are almost always kept together and aligned enrolling people from both inside and outside the professional community one belongs to.

Practicing technology is generative for the ongoing development of maintenance-related activities, because is not the closure of things to be central in developing the action, but rather the affordances emerging from DSF at work, which individuate specific possibilities for action and therefore shape how things are worked out, questioned, and stabilized.

Although this phenomenon is contextual and situated, there are nonetheless some recurrent patterns of mobilizing things, some persistent arrangements and some historical developments that tie connections among the distributed realities, so that they could be seen as a broader assemblage on which the singularity of the system is somehow preserved. The different ways in which those assemblages come into being, differently work for both the preservation of multiplicity and the consistency of the system. Indeed, singularity can not be achieved without the understanding of how all the different elements mobilized contribute to face complexity and misfits, to preserve the openness of standards, to account for the different dimensions of which each single practice is composed, and each single purposeful use DSF might play at different levels.

For things to be satisfactory aligned, which is through a large extent the basis of the system's survival in both terms of workability and functionality, is then necessary that the assemblages are flexible and opened enough for being disassembled and reworked. The consistency of the whole is hence kind of guaranteed by the generative power of the assemblages, which re-create the possibility for change starting from the reflexive enactment of the system at work.

9. HOW USERS MATTER[173]? PARTICIPATION IN MAINTENANCE-IN-USE

As closing chapter of this work, I want now to go back to the research questions and address the central goal of this research, namely the analysis of how users matter in the process of maintenance-in-use. So as to answer this question one must look at the added-value of participation in the process of keeping systems alive in an organisational environment. In this last section I will hence develop a broader reflection on those topics, taking the experience of the field into account. Did users mattered in maintaining the system? If so, how did they enter this process? To which extent might we talk about participation? Those questions draw a red thread which we will follow in the argumentation.

As long as the topic of the enquiry is the extended period of DSF implementation, I argue the most fruitful way to start from is to account for its historical unfolding, including the design process. Indeed, the evidence of continuity between what is traditionally conceived as 'design' and 'implementation' clearly shown up in the chronology of DSF. Moreover, the system's design started long before any digital device was around, considered that DSF was born from the re-assemblage of PSF structures and contents into a digital form. also once information technology became available, the DSF did not immediately 'surf the web', as the connections were kept by programmers who commuted through the region to pick up the digital Access databases, while drawing them together only at a second stage. The idea of a unified web-based information system emerged only once the technological affordances allowed Regional management to implement it, which is to say, once the transmission of local databases was already happening via email. For these reasons and since the origins shown to be quite unclear, to draw the borders of design is somehow difficult with reference to my case study.

As a consequence, I want to take the process of the web-based DSF's design as the starting point of the investigation, and see whether it has been developed together with operators or not. During one of the preliminary interviews I asked Hans (DSF developer) which methodology they applied to come up with what they thought to be the most fitting software:

> "*Well, no methodology in particular…I mean, the system wasn't so complex to think about it.* […] *Let's say the approach hasn't been scientific, I mean, we tried to build a*

[173] The title is of course borrowed from the outstanding Oudshoorn and Pinch's book of the same name (2005)

system which could make data entering as easier as possible. That choice was led by the fact that, at the beginning, the aim was to design a work-supporting system which […] *would have combined data entering without compromising information gathering*"[174] (Hans – DSF developer, T/A)

But then this tension between workability and information gathering led to a progressive turn:

"*when the consultants entered the situation, they brought into a more definite aim at data gathering. Regional Department already asked for it, but thinking about a pure data gathering system has been a tremendous error.* […] *Nowadays, in my opinion, DSF is not used on a daily base because social workers don't see it as a support for their activity; and it is not, indeed. The only exception I noticed it's where DSF is combined with MSAD. there they see the usefulness and they use it*"[175] (*ibidem*, T/A)

This rather bleak reading of system development is partially contradicted by the empirical evidences: true, DSF does not seem to be a work-supporting tool, neither a mere statistical device, though. On the contrary, it seems the result of the combination of the two, risen from diverse negotiations, principally emerged from the 'Commission' meetings. In these occasions, thanks to Regional Department, the attempt at harmonizing practices and languages of social work across the region came into stage. According to what Brunhilde – the regional manager in charge – told me, thanks to this process of accumulation (see Ch. 7.1) the 'new DSF' will be much closer to practitioners' working needs.

The story of DSF birth and development can thus help to summarize and highlight some specific tenets of its design.

First of all, whereas system's analysis identifies design as the process starting with the building an information technology-based artefact, the DSF development seems to me to root back in the history of PSF and its implementation.

To look at design before the design, makes it easy to perceive the generative power of assembling things together: DSF history shows how, from a specific combination of people and

[174] "*Non è che abbiamo usato una metodologia vera e propria…cioè, il sistema non aveva una complessità tale da farci una ragionata. Diciamo insomma che l'approccio non è stato proprio scientifico, abbiamo provato a creare un sistema che agevolasse il più possibile l'inserimento. Questo perché all'inizio si voleva creare uno strumento che supportasse il lavoro che […] combinasse le esigenze di inserimento dati rispettando alcuni vincoli strutturali*"

[175] "*Quando sono arrivati i consulenti, hanno introdotto una visione più orientate alla raccolta dati. La Regione già lo chiedeva, ma pensare ad un sistema di pura raccolta dati è stato un errore tremendo. […] Per me ad oggi la CSI non è utilizzata quotidianamente proprio perchè le assistenti sociali non lo vedono come un supporto alla loro attività, ed infatti non lo è. L'unica eccezione è quando alla CSI si combina il modulo SAD. Là ne riconoscono un'utilità e la usano di più.* "

objects things got mobilized and stabilized differently as new ways of doing (PSF classification-in-use), technological affordances (Information technologies and the web) and new actors (consultants) became involved in the webs of activity.

Looking then at the design phase from the users-system relation's point of view, how can the case fit into the established scheme emerged from the literature (see Ch. 2.1)? If a system can either be designed for, with or by the users (Ciborra & Al., 1983; Karenborg & Stahlbrost, 2008), honestly speaking I find really hard to say into which of these cases DSF history can be ever classified. Indeed, PSF classifications have been designed for the users and stabilized by the users, whilst group work might be an example of co-developed (with the users). Indeed, in theoretical terms, in this latter case users have a strong power of determining the contents, whilst programmers carry on the design as they like. According to Hans' remarks, and namely that "*social workers went often back home bemoaning the lack of decisions…well, at the end it's the Regional Department who decided.*"[176] (T/A), also practitioners acknowledged that there was something similar to co-development going on and therefore to participate was not just a rhetoric. However, what emerged from the field shows that their possibility of shaping contents was not so effective, after all. Looking at the temporal unfolding one can easily notice that users played different roles in time, the less relevant in shaping system as the software developed.

In any case, for whom the system has been designed remains partially unclear from a practice-based assessment. Indeed, it does not seem to be designed to fit social workers practices, also if it might help them in programming and monitoring their care processes. At the same time, and just for the reason that data are partially out-of-date and creatively entered, also the statistical significance can be questioned. Thus, looking at the structures embedded in DSF configuration, one can only notice that the managerial criteria took advantage over the workability.

Finally about design, how to individuate when the process ended? Of course, putting in use the system matters: to have or not to have the system in use does make the difference, especially for those who did not participate to the Commission. Nonetheless, if we look at the activities performed in the design and the implementation, we can see that the system was continuously managed as a work-in-progress. To this extent, the idea carried on by a substantial part of Participatory Design's literature of a continuity between what comes before and what after the software's release, finds here an empirical validation (e.g. Sumner & Stolze, 1997; Dittrich & Al., 2002).

[176] "*Le assistenti sociali tornavano spesso a casa lamentandosi della mancanza di decisioni […] In effetti alla fine è la Regione che decide*"

After pointing out some preliminary stances about system's design, the analysis can shift to the object of the research, and namely taking a look at what maintenance-in-use tells us about users and participation.

Among the research goals, to answer the question if and how users matter in software maintenance is of fundamental priority. From the reconstruction of the different activities at the basis of maintenance-in-use (see Ch. 7.1-4), it is difficult to neglect users' centrality in keeping systems operational and workable. Therefore, it is not a stretch to say that users matter. However, trying to answer to the question 'how they matter?' and 'how they participate to the phenomenon?' makes things less clear. Indeed, on the one hand it is problematic to univocally identify who is the user, on the other, to assume an historical perspective implies to account for how people differently relate over time.

In the reviewed literature, several definitions of users have been deployed (see chapter 2.1): end-users (Karenborg & Stahlbrost, 2008), lead users (Von Hippel, 2001), users representatives (Ives & Olson, 1984), primary, secondary or tertiary users (Eason, 1987), and so on. These definitions stratify people according to either the organisational hierarchy or to the functional role they play in specific processes. I do not want to deny neither that "*to classify is human*" (Bowker and Star, 1999), nor that such categorisations played an important role for the analysis in which they have been applied. My argument is rather that they hardly fit my fieldwork's findings. On the contrary, to assume the user as 'everyone who use the system' (see. Ch. 3.1) enables a deeper understanding of how things were going on in the field.

The first reason is due to the fact that the Regional Information System on Social Services is plural: there are several applications, each of them constituted by different parts, differently enacted according to the practice in which they are enrolled. It would be easy to identify users with social workers, but what about DSF administrators? they record data on social workers' behalf, they manage DSF database through BOWI, they mobilize reports, spreadsheets and paper folders as parts of their work of keeping data updated. The support programmer fixes social workers' mistakes, he manages the database, he mobilizes DSF categories, time-frames and interventions as much as social workers do. Finally, Regional managers rely on DSF reports to preserve database consistency and to support policy-making.

Secondarily, to maintain the system alive is largely a matter of assembling people and objects over time and in different places (see Ch. 8). Consequently, none of maintenance-related process is disconnected to the others, and that means that nothing about keeping systems workable and functional is a matter of a single professional group. Take for instance PN social workers' group:

they tried to review DSF classifications and, in doing so, they relate with other social workers' practices (when they put their practice in relation with the other territories' ways of doing), they shaped their work with respect to what emerged from the Regional meeting and the District's plenary. In other words, they acknowledge that their way of using DSF was intertwined with how it was mobilized elsewhere. Moreover, these arrangements changed over time, and they changed so that is not possible anymore to say whether the agency solely relies on a single group or not. Since use is something mobile over time, also users may vary. Hence, as I proposed in the theoretical premises of this work, the use is the place in which users define.

Users matter also when they avoid to use the system. For instance, social workers can either exploit DSF for their daily purposes or totally neglect it, thus becoming 'non-users'. Quotations as the following one are clearly representatives of the concept. The practitioner compared DSF with the clients' PSF:

> "*I use the PSF much more than the DSF, of course. Into PSF I store my colloquia's and phone calls' notes, documents like decrees, court relations, communications, and so on. DSF has some blank spaces but no one uses them. PSF is hence much more used, it is handy, if we have to move we can bring it with us and we have all we need.*" (Vanna, social worker, T/A)

Whilst with DSF:

> "*you have a much more immediate list of the interventions; And then the dates… if I don't remember a date, I can retrieve it more easily from the DSF instead of searching the cabinet. It also helps you to focus on your work and what you work for. I mean, it helps you to synthesize. Consequently, you have to think about your work*"[177] (ibidem)

Interestingly, not practicing DSF also contributes to system's maintenance. Indeed, relying on different objects circumvents the disalignment: without the PSF, social workers would have stored all their notes and documents into DSF, so that the DSF forms should have been re-designed to contain those elements. This could have either led to a complex renegotiation of contents or even to the system's failure. In this case, discharging misfits or just finding an alternative solution outside the system's domain represented the best way to keep the system operational.

Creative uses and workarounds served the same goal, as well. Consider for instance the habit of using the DSF summary page as an official document for legal processes. Social workers realized

[177] See notes 71 and 75, Ch. 6.2

that the DSF summary page contained all the information Courts may need without releasing their personal notes on clients. Therefore, they kept using it on a regular basis. True, the DSF was not designed to be used in this way and Regional Manager would have perhaps criticized this practice. However, that forced social workers to have their data perfectly updated at any time, so that the general consistency of the database benefitted from it. Hence, users matter in system's maintenance also when they misuse or do not use the system.

The point is that without those processes of mutual understanding, co-working, tolerance, workaround, deferrals and so on – all of them inherent to the practical enactment of technology in a relational environment – it is barely imaginable to think about DSF maintenance. Social workers will preserve the system in tune with their work practices but this would not be allowed to communicate with the others and there would be no possibility to fix errors. Programmers could easily preserve system's functionality but not the workability. Management could use data but they would be uncertain about their trustworthiness.

Therefore, generally speaking, users matter to the extent that, being enrolled and mobilized in different assemblages, they generatively contribute to maintain the system alive. In other words, users (no matter who they are) are fundamental because they are parts of several assemblages of people and things. Such arrangements are generative because the encounters shape the ways in which things are accomplished, so that it is impossible to keep the information system alive regardless of the enactments performed by the people who practice it.

To this latter extent I think the definition of users keeps shaping in the terms already proposed by Lucy Suchman, who wrote that users "*work as category describing persons differently positioned, at different moments, and/or with different histories and future investments in projects of technology's development*" (Suchman, 2007: 278-9).

The first part of this definition states the usefulness of looking at people within specific arrangements and how they move over time. More specifically, to study the use in relation to the unfolding of maintenance deals with how things shape through the mobilization of things, power, knowledges, professionalisms, and strategies. The second part of the sentence (*future investments in technology's development*), seems to me the perfect anchor for questioning the concept of participation in the context of maintenance-in-use: the question "to which extent participating matters for maintaining a system?" does not seem to have a foregone answer.

Indeed, it is first of all crucial to agree on the declination of participation. Analyzing the topic in chapter 2.3, I anticipated the different meanings that participation may acquire. Assuming the 'weak acceptation' (Gallino, 2006) does not help the understanding because at this point I already show

how practitioners who take part to system's use contribute to maintain it: from looking at how the different activities of system's maintenance unfolded, the researcher can sort out the contribution of each and every actor mobilized in the different arrangements and the generative consequences they might have.

However, I recognize a difference between practicing technology and having a commitment in shaping how things develop. Indeed, to say that the technology progressively finds its place within the different workpractices and that is one of the most prominent processes of system's maintenance, does not imply that the system is continuously at stake. On the contrary, the more or less stable arrangements 'drag up' the technology from the horizon of attention. However, I recognized some practices in which the established enactments are somehow challenged or become more visible. In these cases, the attention have to turn exactly to the projects that different actors mobilize toward technology's development, which resources and logics of action they put in place to acquire or discharge their presence.

Hence, the privileged point of view for analyzing participation is DSF maintenance-in-use. The different and interactive practices that mobilized the arrangements in such a context can be placed along the intersection of two vectors: on the one hand, they can mobilize a commitment toward either multiplicity or singularity; to a large extent this distinction overlaps the dichotomy customization-consistency, so that they can be taken together. Therefore, there could be a general aim toward the consistency of the database, which is the premise of for a statistical device for policy-making and planning activity, or a strive for customisation, which is the base for the workability of a supporting tool.

The second vector develops from the preservation of the existing structural configuration of the system (interface, business rules, database) to system's evolution, no matter if changes are potentially implementable or not. Indeed, as I pointed out tens of time already, system's enhancements are not necessary in order to maintain the enrolment of DSF into everyday practices. Moreover, not being an institutional goal, DSF evolution is not central for everybody everywhere.

Along the intersection these vectors, I identify different aims toward technology, which of course have to be considered in light of their mobilisation in practice. They can be accounted in terms of programs and anti-programs, as Feenberg declined them (1999): specific assemblages mobilized 'ethically' and 'politically'. This is to say that each program carries with it a political and ethical stance through which specific social groups, in specific situations, question the *status quo*, given the specific sociomaterial arrangement in which they are placed.

Hence, participation should be analyzed by taking into consideration the mobilisation of specific aims toward technology. There will be practices which mobilizes things without comprising a system's change an others which tent toward DSF modification. Whether the changes end up to be effective or not, it not necessary matters. Indeed, if DSF's constitutive parts just slightly changed over, the results of mobilizing an active commitment toward system's enhancement materialized in what I called *accumulation* (see Ch. 7.1).

Consider for instance the use of the 'extend button', through which social workers un-reflexively renew an expired intervention, or the set up of the 'countervailing stocks', which maintained the local database's consistency without questioning where did data disalignment lie. Similar practices contribute to preserve the system-at-work – to the extent it is not rejected, at least – but they do not aim at modifying it; they are not necessarily against technological change but they do not mobilize any commitment toward further implementations. I labelled examples as such 'preservative practices' (see Ch. 3.2), just because they do not challenge the *status quo* and they pursue the aim at mitigating technology's meddling into more or less stable workpractices.

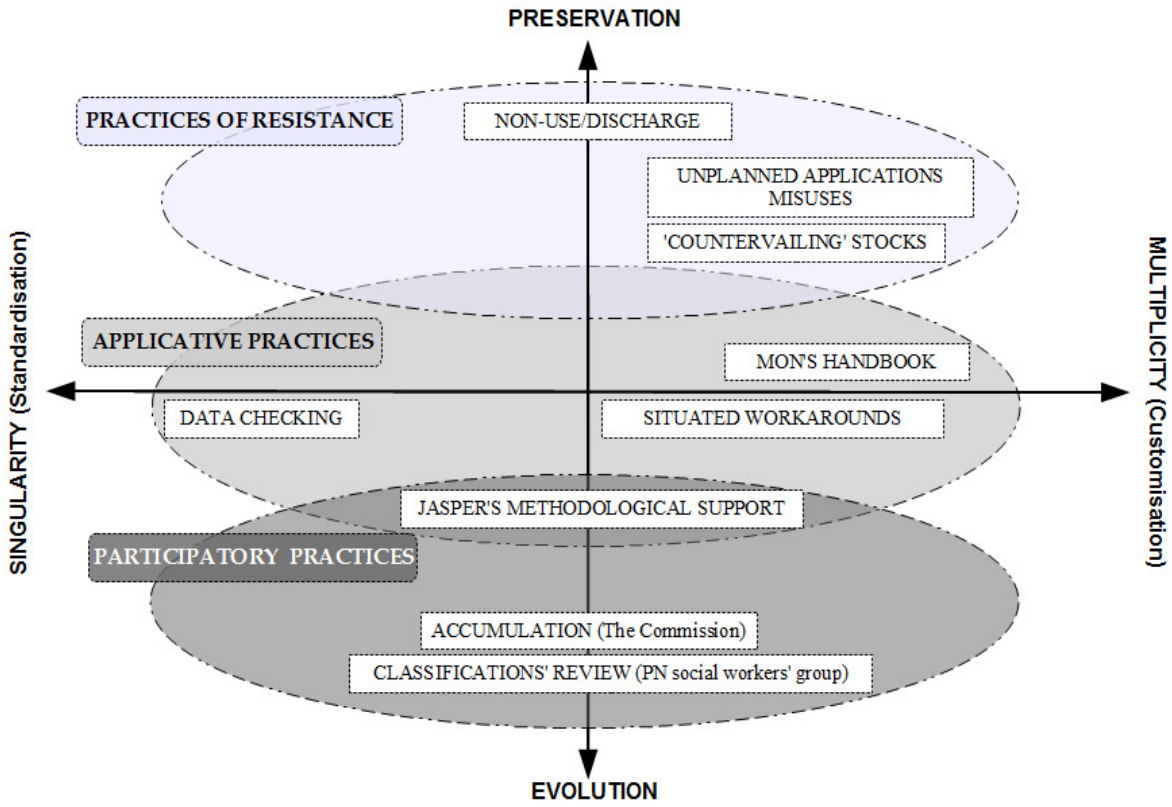
Diversely, classifications' working out is the most outstanding example of an other family of practices. In such a process the actual meaning of classifications-at-work is continuously questioned and shared with the colleagues. Such kind of practices assume technology as one of the element of the assemblages and therefore aim at harmonizing things so to assure the general consistency of the work-with-DSF. They represent an attempt at re-assembling things so that they better fit the work, *given* the structural configuration of the system *and* being aware of DSF's entanglement in the performance of daily activity. Differently from the first group, these practices challenge the established assemblages and question them until they reach a satisfactory balance. Borrowing the terminology from Orlikowski (2000) I named this group 'applicative practices'.

Finally, going back to PN workgroup activity enables to display the last group. In short words, that group's duty was to review DSF classifications' system so to update it according to the intervened changes. Among the several activities they performed, practitioners checked off expired or outdated classifications and communicate to the Regional Department the necessity to erase them from the interface. In doing so, they were reassembling things *questioning the stabilisation* of the system, prefiguring a change. This proactive commitment toward a mutual negotiation of technology's contents and business rules is what characterizes the 'participatory practices'.

In the picture here below I reconstruct the framework individuated by these three groups of practices in light of the logics that they mobilize. The crisscrossing vectors individuate four quadrants, in which I positioned different events, elements or activities according to the family of

practice to which they belong. Preservative practices are positioned at the top of the picture, closer to the preservation area; in the middle stand applicative practices whilst at the bottom the participatory. The overlapping ellipses mean that these practices are not disconnected at all but interacting even within the same activity (PN groupwork, for instance, encompasses activities of different kinds). The case of applicative practices, which I positioned across the middle line, it is rather interesting because, although they do not aim at changing the system, they express a different sensibility toward technology. That is quite explicative of the fact in no way the system disappears, but it is differently mobilized (neglected or misused in case of preservation).

Picture 10: Practices grouped accordingly with the aim toward technology development they mobilize



Looking at this scheme from the participation's point of view, I can conclude that the more the activities approach the evolution pole, the more people involved shift from participating as 'taking part' to the proactive and informed commitment toward system's design-in-use.

As I already noticed, both the elements contribute to maintenance-in-use, so that I am not stating a prominence of participatory practices in understanding the phenomenon under inquiry. Indeed, saying that just participatory practices play a role in shaping the phenomenon would be a

mystification of the empirical evidences, considered that keeping systems alive is based on technology's use and non-use. Thinking about the different enactments documented in this work, I argue they all matter with reference to system maintenance: even the cases of 'non-orthodox' use – the mechanical filling of basic information once per year, for instance – served the goal of preserving both the consistency of the database and the workability. Just because the actors are engaged in meaningful activities (Wenger, 1998) they contribute to shape the phenomenon of maintenance-in-use. By the way, the mobilisation of specific logics of action does not take place in a vacuum, but it is highly depending on the generativeness of the assemblages over time. For instance, the set up of a specific working group in PN District has been enabled by the fact that the District manager participate to PSF design, that they tested MSAD, that connections with Regional Department were more tight than elsewhere and thanks to the diffuse enrolment of DSF in diverse work processes (Homecare, policy making, dedicated plenary, and so on). All these elements created a fecund ground in which a specific commitment toward DSF classifications' alignment with the service's development. On the contrary, in MON District, the original aim at contributing to DSF design, sustained by the interest of the Regional Department to closely look at their internal database, then turned into closure once the affordances of the tool demonstrated to create more problems than opportunities in relation to their ways to mobilize digital archives in daily life.

In any case, to this extent practicing and participating are almost overlapping concepts (Gherardi, 2009), and therefore they do not tell us much about the power of people in *actively, legitimately and effectively* contribute to system development. On the contrary, the more we move toward the 'evolution pole', the more a specific commitment in shaping system evolution becomes noticeable. The worth of participatory practices is that they express users' programs of action with specific reference to where they want to direct system's evolution. Moreover, they mobilize things all along the continuum between singularity and multiplicity, showing that to maintain a system multiple *is* actually a way to maintain the system as a whole, to make it find a space within the relational environment in which it is posed and the conflicting goals, logics and professionalism mobilized within. When PN group reflected upon 'work counselling' intervention, for instance, they actively expressed an orientation toward system modification (evolution), just for those who applied this project (partiality) with respect to those who had a different organisation of the work (multiplicity) and thus aiming at changing the classification's system so to grant a general workability of DSF (singularity).

Coming to a conclusion, I can summarize some aspects about participation and maintenance-in-use.

- First of all, participation as practicing technology plays a fundamental role in shaping how the system is maintained either workable, functional and consistent, although it is not sufficient to understand the dynamics that can enable or stand out against system's evolution.
- Participation does not naturally refer or belong (as a property) to specific and defined professional groups, but it is rather emerging from the reiterate encounters of different actors. Moreover, the same people, along with the same objects, within the same activity, they could be assembled and re-assembled differently accordingly with the meanings underneath the practice that is going to be performed;
- What is interesting in participation's concept with respect to system's maintenance is that it is based on how different programs of technology's evolution come into being from the interaction of different sociomaterial practices; acknowledged that encounters are generative, participation's boundaries are always questioned and evolving;
- The mobilisation of the specific commitment toward technology's change is not always detectable from the elements embedded into the artefact. Indeed, it can either lead to system's evolution or not (e.g. 'accumulation', 'abandonments'), but it has the worth to show if and how people express a need for *actively, legitimately and effectively* contribute to system development.

CONCLUSIONS

"But the other way to think about this once again shifts away from the question of what you actually built into the system, towards what the arrangement of the system is, through which the system is established or positioned"

[L. Suchman, 2011, *private talk*]

This work aimed at proposing a sociological account of the process of Information System maintenance, focusing on how it unfolded in everyday activities within an Italian Region welfare system., Therefore, the research focused on the situated encounters of people and technology(-ies) at work. On this basis, I also proposed to look at how people matter in shaping how maintenance unfolds and to which extent participating has an added-value for the phenomenon.

The reader who has read up to the end this work followed the argumentation from the literature review to the empirical findings and analysis. In this conclusion, I try to elaborate some further reflections on the results of the research and some of its implications.

First of all, referring to the argument I fostered in chapter 8 about sociomaterial assemblages and the development of the research object's phenomenon, I will further reflect on the topic of agency as a key feature in the study of organizing.

Secondarily, I will discuss the research results with reference to the debate on information systems' design and implementation. More in specific, I will challenge the notion of design with respect to information systems' maintenance-in-use.

Moreover, since doing research is generative and the more you try to aim at your research goals the more interesting questions rise, I will take the occasion to address two of these which really appealed me during the research experience. Looking at maintenance-in-use from the point of view of sociomaterial assemblages stimulated to challenge the notion of technology in terms of standards and media and also to question the idea of novelty and old about technology.

In addition to this theoretical reasoning, performing a Multi-Sited Ethnography also enabled a methodological reflection on how to design and carry on the situated study of distributed systems. In this final chapter I will then try to start from my reflexive field experience to share some concerns on the 'ethnography on the move' (Wittel, 2000).

Finally, although it is not a deliberate end of the research, I will reflect on the potential implications of studying maintenance-in-use for the work of designers and developers.

Developing the reasoning on agency, I want to start by recalling one of the most interesting and perhaps counter-intuitive findings of the research: despite the efforts lavished in the processes underneath system's maintenance in terms of both workload and funding, maintaining a system seems to be anything but a manifest goal among practitioners. Indeed, the awareness of the necessity of DSF maintenance over time rarely emerged in their narratives, whilst it is much more present in the management's speeches and plans. Turning to practical implementations, maintenance emerged to be a mostly unconsciously pursued and achieved outcome of diverse activities aimed at other manifested tasks: early stage group work aimed at standardising work practices so as to achieve data homogeneity but it turned to be an arena in which the opposite goals of making the advancement in work visible while weakening the supervisors' control emerged; the support offered to practitioners wanted to deal with the correction of errors, more than the harmonizing process which revealed to be; finally, data checking was set up mainly for the maintenance of the database consistency for policy making reasons but it enabled an extensive reflexive process which influenced the mobilisation of technology-at-work. According to my analysis, maintenance-in-use emerged as a consequence of this rather unintended processes of negotiation between different logics of action.

Such an acknowledgement challenges the idea of a universal intentional rationality leading the phenomenon of keeping systems alive. On the contrary, looking at how things developed over time suggests that the source of agency must not reside on actor's plans and attributes but 'somewhere else'. Research findings rather suit with the idea that agency is performative (Barad, 2003) referring to the results of specific encounters over time. Indeed, it is the combination of people-and-machine which is generative, in the sense that it generates new possibilities of development of action. Hence, the focal point for the definition of maintenance-in-use is the understanding of the multiple assemblages of people and objects which are kept together in the accomplishment of minute activities, differently oriented. Thus, what has emerged as fruitful at an analytical level has been to comparatively account for the arrangement of these multiple enactments along with their historical

development. Just to provide some examples, it is hard to understand situated workarounds without taking into account the process of designing DSF forms and standards, which are themselves a re-assemblage of those embedded and fixed in PSF; moreover, how to account for the configuration of the DSF at work without considering which material elements are involved in the action, or the "how" and the "when", for instance? Such combinations are nothing but the cumulative outcome of progressive encounters, or better, recursive processes of mobilisation of different elements over time. Central to this argument is also the idea that agency has to be released from a humanistic view of human intentionality (Suchman, 2007, Ch. 15), for it is the assemblages that are generative, the combinations of people and things that shape the unfolding of action, which of course overcomes the boundaries of a mere human strategy. This latter is situated and it concurs to the phenomenon just once it gets mobilized. DSF, PSF, material artefacts, logics of action and narratives are so deeply intertwined that it is impossible to say on which element of the network the agency relies. At the same time, one cannot possibly talk about machine's affordances, because what leads the action is the mobilisation of objects within specific settings, so that the same element enacted in different places identifies different possibilities of further development.

The analysis of how things are mobilized in different settings and diverse processes thus led to the reconstruction of relational and meaningful ways of tuning software parts according to the contents of workpractices. Condensed in specific activities, such assemblages constitute the way in which the system is maintained in use. Indeed, the mobilisation of the DSF followed specific paths according to the practice which put it in motion. Generally speaking, such mobilisation never encompassed DSF as a whole, but rather partially activated specific elements of the technology. From here, the relevance of DSF multiplicity for the maintenance process relies just in as the ubiquitous, partial, contemporaneous and provisional enactments of what is conceived as a whole. I argue, this is the core element emerged from the field work, and namely that maintenance is possible if the system is enacted on a situated basis, for it is locally that the alignment between technology and work finds its accomplishment. A second source to be acknowledged are programmers and DSF local administrators, who mobilize DSF on matters displaying different logics of action, thus harmonizing inputs coming from the domain of management and social work . Such middle-range people acted as weavers condensing part of the multiplicity into coherent assemblages at a higher level. It is also thanks to them that different commitments met halfway, and much of the consistency of the system got maintained. Mediators of languages, plans and strategies, these actors tied things together while leaving , at the same time, the system open to mobilisation, which revealed to be fundamental for multiple realizations.

The task of the researcher is then to try and draw a red line among those arrangements , shifting from the multiplicity to analyze how disintegration is avoided or what drives the consistency of the system at the regional level. Multiplicity leads to singularity to the extent that different actors care about different DSF parts, so that the combinations of such situated alignment represents one of the sources of consistency. Agency is thus distributed in the interaction of the assemblages, arranged with meaningful purposes which, if accounted as self-standing elements do not help the comprehension of the entire phenomenon. As multiplicity leads to singularity, so the mobilization of multiple logics of action lead to shape maintenance-in-use.

The second point I want to debate in this conclusions concerns information systems' development. Indeed, from my evidence, I can also conclude that to maintain a system has almost nothing to do with design. I am of course referring here to the various contributions reviewed on the topic of design-in-use (Bodker, 1999; Dittrich & al., 2002), which I already found to be closer to my research than any other concept encountered in literature. Whereas one can easily agree on the idea of a continuous work on the system , the term 'design' creates problems somehow. I can find two main reasons for this.. First of all one might question what 'designing' means. As seen, there are scholars who argue that compiling the database is in fact a change in the software. Each single entry makes the system something different from its previous self. Although one may agree in theoretical terms, this position shifts the attention from the software to its contents (data), leaving aside the business rules which tie data together in a coherent information tool[178]. Moreover, concentrating on the database has, in my opinion, nothing to do with design because shaping the structural connections and rules simply does not fall in the horizon of interest.

Anyway, the reasoned rejection of this position does not exhaust my argument. Going back to Chapter 1.3, I came to the conclusion that the 'concept of' design primarily deals with coding . No matter how one defines the process underneath it, software's changes happen through the rules which make the software itself work. Being these activities visible – such as modification of the interface – or hidden – like, for instance, the algorithms that check data consistency –, they all require an intervention on the code. Owed to that, maintaining a system *does not mean designing it, or at least not necessarily nor exclusively*. A compromise with the literature could be achieved stating that maintenance deals with design if we agree that 'designing' means writing down modifications on paper for future development, so to say, an holistic design which does not merely

[178] Mauri (2007), for instance, questioned the difference between data (e.g. recordings) and information, namely data arranged for knowledge purposes. If one agrees on that, it is pretty meaningless to talk about an Information System without taking into account the structure which draws relations among punctual bundles of data.

refer to the system but to the sociomaterial assemblages which shape the system-in-use. In my case, this option is evident in what I called 'accumulation' (see Ch. 7.1). There, the system is designed in theory, *in potentia*, no matter if and how this *meta-design* leads to practical changes in system usage or not.

In any case, shifting from abstract reasoning to the evidence of maintenance-in-use, the phenomenon can be mostly understood in terms of technology realizations . Once again, I do not mean that 'technical' intervention has not been performed from the early implementation onwards, I just think that simply looking at them does not help to grasp the complexity of the phenomenon which I tried to address in this work. Furthermore, as I already argued in previous chapters, activities such as team working and classifications workarounds seemed to be situated practices to design the use, rather than an attempt of design-in-use, for it is the realizations that change according to the sociomaterial affordances, whilst the structure of the software remains the same.

Hence, to a large extent maintenance-in-use is based on the situated alignment of technology and organisation, even if the term 'alignment' never seemed to satisfactorily label the object of the research. Indeed, 'alignment' concept just partially covers the range of activities risen from my empirical findings, neglecting the analysis of the links between maintenance of digital artefacts and their uses, misuses, failures etc. (an outstanding exception being here Ciborra – e.g. 1992; 1997). To this extent, maintenance-in-use, focusing on the centrality of the system within situated environments, enables further explorations on how things get aligned but also misaligned and ignored.

What maintaining a system alive means is thus the central point of the discussion here. Although a technical support is always required and fundamental, maintenance does not solely mean preserving software technical functions. MSAD[179] was perfectly running in several Districts but it did not work in the MON case for it was simply too much misaligned to the organisation of the work. On the contrary, DSF often stopped working but still remained in use. In the theoretical framework I preferred to talk about *centrality* in the work practices. Under the light of the field work, I can state that maintaining a system alive is a process which *allows to mobilize it even partially, in the context of everyday activities*. In other words, no matter if it is running smoothly, no matter if it is displaying a work overload, a system is maintained as long as practitioners embed it in their routines, being this the use of the interface or the mobilisation of classifications, languages, timeframes, etc. . This touches the sphere of both usefulness and compulsoriness, but also with the unaware evolution of mundane practices, direct consequence of the generativeness of assemblages.

[179] MSAD is the software for Homecare services' management.

In one simpler word, what needs to maintained is mainly the *workability* of the system. Workability means here a satisfactory degree of fit with workpractices, but also the preservation of the openness of affordances, so that change may take place.

Besides maintenance, there is a second concept central to the present research which addresses the Participatory Design community's debate, i.e. .the issue of participation after system release and the role users might have in its development .

Approaching this topic in the light of the literature, I somehow felt – both theoretically and empirically – uncomfortable with the conceptualisations offered in the past. Indeed, from the very epistemological stances assumed at the beginning of the research, I avoided to take a deductive approach, rather preferring, at least partially, an inductive movement from the empirics to the theory. Looking at practices to understand a phenomenon requires the field itself to draw the research path as much as possible. The interpretative categories borrowed from the former contributions simply did not fit the evidences of the field, although this of course did not say anything about the utility of such categories in the contexts in which there are used.

Therefore, in this document I rather take a step away from the literature in the conceptualisation of the users, the relations among them, programmers and management, and in the issue of participation in system development. To a large extent, the argument here deals with the criteria on which the categorisation is based. The discourses on users are in this sense paradigmatic. Participatory Design literature wants: i) the user to be distinguished according to the type of system at stake (e.g. Ciborra & al., 1984), ii) users to be subdivided according to the frequency of their encounter with technology (Eason, 1987), iii) finally, to classify users, programmers and management into different categories, (a classification which remains constant) no matter the many 'hybrids' documented in the literature over time (Karenborg and Stahlbrost, 2008). This research, on the contrary, assumed the use as the principle around which building a reflection on users. Obviously, the arguments did not merely pivot around the distinction between 'users' and 'non-users'. On the contrary, what really matters in this research is how the system is used, misused, abused, not-used. In this perspective, everybody is a potential user, and anyone having a commitment, a project and an investment in technology development is identified as a user (Suchman, 2007; Ch. 15).

Hence, to look at how technology got implemented has been taken as a lens to identify the logics of action which spurred activism towards technology itself. On their turn, these logics represent the core of maintenance because they point out which kind of centrality of the system was to be preserved and according to whom. That is the very point of my work: *analysing situated*

arrangement to grasp the underpinning logics which mobilize the activism towards technological investments is the key to understand how and to which extent systems are kept alive.

This approach moves thus away from the hierarchical subdivision overwhelmingly used in literature, while it still enhances the activism and the mobilisation of resources such as power, knowledge and professionalism, hence directly facing the topic of technology at work. Again, I do not want to deny the existence of power structures within workplaces, nor their cogency in the context of work, I simply claim that to take them as actor's characteristics does not contribute to shade light on the research object, which on the contrary benefits from the analysis of how they are mobilized in practice. Much more fruitful is hence to look at power relations and professionalisms as resources that people put in motion.

Middle-range people seemed to be especially important for tying elements together. This assumption questions the traditional separation between programmers, seen as 'technicians' and the executers of management's orders, and users. Here, mid-ranks play as fundamental mediators among different programs of action (Feenberg, 1999), and, more importantly, as translators between barely communicating languages (Orr, 1996), thus identifying maintenance as a process of mutual learning and knowledge sharing (Beguin, 2003).

Moreover, focusing on programmers clearly highlights how the idea of a good design as a getaway for cutting maintenance's costs is in fact an utopia: programmers' work after the design phase increases, and at the same time changes. If it is disputable that this change can be taken into account in terms of funding and investments, what I want to stress here is the amount of work required for the system to be kept alive. Work which has a cost, of course, not only in terms of money but of time, as well.

In chapter 8, I linked this perspective to a renewed view on participation, too. This concept, once again connected in the literature to systems design, here assumes the shapes of the practices in which it became visible. Indeed, the concept of participating as 'taking part' to something, clearly overlaps with the definition of practitioner (Gherardi, 2009). I then shifted the attention and linked participation to the practice which mobilizes an active effort towards technological development, in opposition to, for instance, those practices which mobilize technology to make it fit with the existing assemblage of elements. Participatory practices, strive for a co-evolution of technology and work, whilst applicative and preservative practices (as I labelled them) mobilize (or not) things respectively to harmonize technology-at-work and to preserve the 'independence' of the stabilized settings. If one wonders where the source of change relies in system maintenance, it is probably here that one would find an answer.

Finally, users matter in maintenance not just when they aim at technology enhancement. Enhancements are just one of the outputs of those activities which keep systems alive. So as to understand the phenomenon of maintenance-in-use, practices which are – so to say – against or neutral in respect of system development are of equal interest. The argument here is that a system is maintained in multiple ways, and it goes through dis-alignments tolerance, misuses, discarding of prescriptive diktats, and so on.

The argument up to here tries to draw an open-ended conclusion about the situated unfolding on maintenance in the context of workplaces and workpractices. Such conclusions are open-ended because they could be seen as a starting point for further investigation both on the research object and the topics that have been just briefly touched, and because of the nature of assemblages, which continuously evolve through their reiterated mobilisation in the context of practical encounters.

Besides the elaboration of this fundamental concepts, the reflexive process of the research made me reflect on two topics which, in light of both the theory and the field experience, remain partially undisputed. I take them into account as starting points for further investigations.

The first issue concerns the ontology of the technology-at-work, whilst the second develops an idea for Multi-Sited Ethnography.

As pointed out in chapter 3, analyzing how things got assembled within different practices appeared the most adequate approach to understand the dynamics permeating contexts populated by different technologies, that is to say, in Bruni and Gherardi's (2007) words , 'Technologically dense environments' (TDE). I acknowledge that, as Davide Nicolini stated during the 2010 EASST Conference, more reflection on the mere possibility of talking about *non*-TDE is nowadays necessary. Taking the reasoning one step further, I argue that it is necessary to find an agreement on what *dense* means: are we talking about materiality *tout-court*, or about the way materiality enters social phenomena? Moreover, how does the combination of the social and the material create brand new possibilities for change? Most of the literature tried to answer to the last two questions, which I think are the most problematic. Trying to relate these questions with my field work, a different definition of technology needs to be specified. According to most of the social workers I met across FVG, their professionalism is pinned down on the human relation with the client, the ability of understanding the person in front of the professional, the multifaceted equilibrium between the emotional and 'technical' while taking care of the other subject. Hence, social workers draw a line between all which belongs to such a sphere, and the 'cold' and 'mechanical' technology. However, in order to understand their practice and everyday work, I had to dive into a sociomaterial

environment, populated by dozen of different artefacts, devices, forms, and so on, which did not emerged from their narratives. Consequently, it is arguable that most of the "material" side of the practice already exited the 'domain of the problematic' and is therefore not questioned anymore. . If this evidence has already been reported in numerous contributions in the past, it is here less clear which elements belong to the sphere of unproblematic and which, on the opposite remain at stake. As I did in chapter 6.1 with DSF, I argue that one should first of all disassemble physical entities into constituents and then observe these 'second-level elements' from the point of view of the assemblages. To give an example, mobile phones could be classified as unproblematic for homecare assistants: they are used inside and outside the workplace, they have existed for a while, almost everyone owns a private one. However, the use of mobiles (through a specific software) in the process of homecare accountability took this rather popular piece of technology out from the 'traditional' range of practices so that it entered the area of problematic. One can agree, on the other hand, that it is not the mobile which turned problematic, but rather the elements with which it got mobilized: a new software with its contents, new procedures in the homecare accomplishment, etc.. This example provides justification for the broader reflection in this specific research field on the meaning of materiality: is it a matter of single technologies or rather of *standards* and *media*? In order to reach a higher degree of generality, I can say that some of these standards have already found their embodiment in the diverse practices, while others have not yet. For instance, a lot of progress has been achieved in creating a shared language among different settings which could be fit for social problems in diverse communities, so that talking about 'picking up clients', rather than 'personal care plan' entered everyday language. On this topic I must add that the more standards become specific and stiff, the more their embodiment into practices is questioned. On the other hand, standards such as time frames never truly found fertile ground for their establishment, so that they are still object of discussion, misunderstanding and misuse. It would be too simplistic to impute those dynamics to the introduction of the DSF . Indeed, long before the implementation of the software , the domain of social work had already been populated by standards and classifications. What has changed? On the surface, what changed were the media through which those elements found mobilisation in practices. More in specific, under the DSF, social workers underwent a transition from paper to digital that, as pointed out throughout the entire work, is often mentioned as 'the problem'. In other words, this transition from a standard to compare the paper-based activities inherent to the professional culture to the digital destabilized the acquired sociomaterial equilibrium. Taking distance from the rhetoric of the field, I think that the problem does not rely on the inherent characteristic of the specific media, but rather on the affordances that

every specific media identifies once employed in everyday's activities: PSF is intimate whilst DSF 'cold and sterile'; PSF is transportable but DSF is ubiquitous; PSF is customizable,; PSF is personal, DSF flows, PSF is taken for granted, DSF stimulates reflection on the work, and so on. What mentioned as problematic about DSF is 'counterbalanced' in practice by the evidence that DSF is already part of the work. Hence, the problem is not 'the DSF', but rather (some of) the standards embedded and the possibility they enable or inhibit. The media plays a role to the extent that from paper to digital the possibilities for working around technological constraints decreased.

Pushing the argument a little bit further, referring to paper and the digital as the 'old' and 'new' technology seems to be a nonsense with reference to the mobilisation of technology at work. Despite the mainstream rhetoric of new technologies' implementation as a source for speeding the work up and achieving efficiency and competitiveness, my research findings show it is rather a matter of new and old standards, which can or cannot work according to the media through which they get mobilized in practice.

Finally, the particular epistemological standpoints on which this work has been based, together with the methodology employed, suggests to add a consideration on the act of doing research. Most readers would maybe disagree with some positions I adopted during the argumentation, or with the framing of some concepts . It should be acknowledged, however, that each research is also a product of the researcher-in-the-field. As John Law (2004) pointed out in his book 'After methods', doing a research is the process of shaping the research object by choosing the lens to observe it through, the generative force of the encounter between the researcher and practitioners in the field, the scope and the scale we consciously or unconsciously analyse the data with. As the activities described here above, doing research means in the end drawing things together in specific assemblages of people, methods, narratives, analysis, personal choices, etc.. If we accept that the researcher's activism is not neither deniable nor preventable, research raises questions of reflexivity, responsibility and ethics . I tried to analyse my position within the context by constantly comparing the boundaries I imposed on the reality I was observing with those imposed by practitioners. The described assemblages are thus the reflected and questioned outcomes of the encounter between the researcher's scale and the people on the field's ones. Challenging both the absence and/or differences of elements involved and the dimension of the arrangements in relation with the practitioners' reconstruction has been especially useful to my purpose. The generalisations I propose, are then intrinsically tied to the empirics. This should not be interpreted as a justification

against criticisms, though, but rather the acknowledgement of the researcher's presence in the whole process of studying maintenance at work.

Such a reflexive process led me to reflect of the research methodology, as well. In my opinion, there is indeed a topic which literature does not seem to have taken enough into account, yet. Exploring distributed systems which are contemporaneously enacted across different spaces and times, focusing on flowing processes and relations which tie people and things, it is a lot to grasp for a single researcher. Does Multi-sited Ethnography hence require a more than one researcher organized as a team? If MSE does not aim at diving deeply into a specific culture, but rather at grasping connections and flows (Marcus, 1995), it would then perhaps benefit from a multiple perspective. Positioned at different levels, concerned with exploring diverse interactive practices, such perspective would enhance that process of reflexivity upon which the consistency of modern qualitative research mainly relies.

In conclusion of this work, I think that the research findings can clearly contribute to the reflection on systems' design and implementation. I already addressed this topic talking about the design concept, but let me make here some explicit statements. Acknowledging that systems undergo a deep process of rework and get enacted in creative ways within multiple sociomaterial assemblages challenges the idea of a 'good design'. Bødker said that designers should act so to make the systems able to address the unanticipatory nature of enactments. I do not want here to neglect the added value of designing the systems the closer to workpractices as possible, but to argue that also the most 'participatively designed' artefact is destined to be questioned over time. Hence, systems ought to be designed not just to fit the unexpected, but to *allow* it, meaning that they have to be flexible and opened enough to let practitioners easily enacting them.

However, it could not be enough: much of systems' maintenance does not inherently deal with systems structures' rework. On the opposite, it revealed to be largely a matter of negotiating different logics of actions toward technology, which, on their side, shaped the situated ways of preserving system's workability on operability. Therefore, maintenance-in-use is highly depending on the social aspects of performing technology, so to say the generativeness of people-and-technologies. Such an acknowledgment has fundamental implications for designers' work: they should not be considered as the 'executive arm' which closes the multiplicity of realities into black-boxed business rules, but better as translators. Being in the middle of the fundamental processes on which maintenance-in-use is based, they have to be able to grasp the different logics of action towards technology's development which rises from the mobilisation of different arrangements.

Therefore, much of their work deals with translating from a language to an other, among different technological programs, *enabling* the process of negotiation which leads to systems' maintenance, instead of closing complexity into bunches of code. Schon (1983) suggested that the designer has to act like a reflective practitioner; I argue, designers should act also as the reflective researcher, the one who analyzes multiplicity to preserve systems' consistency and singularity. To me, the added-value of IT specialist emerges just once they dismiss the clothes of technicians becoming the gateway for knowledge sharing and negotiation. They should not prevent misuses, they have to manage them, they are called to take into account non-uses and act accordingly, they should be aware of the generativeness of the encounters between even conflicting programs of action. Given their middle-range positioning, they have an enormous opportunity to practically lead the way of the maintenance process.

Of course, they have also to be allowed to act as such. Although they could surely find their spaces amid their prescriptive tasks, it is nonetheless necessary for the management to acknowledge that much of the investment in an information system's project does not concern the design, but the artful copying with the system-at-work. Consequently, it is the case to move away from the accountability of systems' costs in terms of the merely monetary funding. On the contrary, maintenance's costs should be accounted in light of the professional investments lavished in the ongoing tinkering with the system-at-work. Keeping a system alive is not a matter of its adherence with the initial requirements but rather of preserving its singularity given the multiple emerging requirements coming from the evolving possibility for action that the system-at-work enables.

TABLE OF ABBREVIATIONS

Alley	Registry application
AMP	Ampezzo (Toponymy)
ANT	Actor Network Theory
Art.	Article (law)
AS	Assistente Sociale [en: SW]
Ascot/Web	Registry application
ASF	Autonomy support fund – FVG dedicated fund [it: FAP]
BER	Bertiolo del Friuli (Toponymy)
BO	Business Object (programma) [en: BOWI]
BOWI	Business Object Web Intelligence (Application)
c.	Comma (it.) (article's paragraph)
CAS	Castions di Strada (Toponymy)
CAT	Computerized Axial Tomography
CC	Call-centre
CDR	Codroipo (Toponymy)
CSC	Cartella Sociale Cartacea [en: PSF]
CSI	Cartella Sociale Informatizzata [en: DSF]
DCR	Decreto del Consiglio Regionale (Decree of the Regional Council)
DGR	Decreto della Giunta Regionale (Decree of the Regional Commitee)
DL	Decreto Legislativo (Law Decree)
DM	Decreto Ministeriale (Ministerial Decree)
DM	District Manager
DPR	Decreto del Presidente della repubblica (Decree of the Republic President)
DSF	Digital Social Folder [it: CSI]
FAP	Fondo Autonomia Possibile – Finanziamento regionale FVG [en: ASF]
FAQ	Frequently Answered Questions
FVG	Friuli Venezia-Giulia
Gespeg	PN municipal Management information system
GR	Grado (Toponymy)
HCA	Homecare assistance [it: SAD]
HCI	Human computer interaction
ICT	Information and communication technology
IEV	Integrate Evaluation - DSF intervention category
Insoft	Software House (here naming the application it released)
IP	Internet Protocol
IS	Information Systems
ISEE	Indicatore della situazione economica equivalente – Tool for measuring family's wealth
ISSS	Information System on Social Services [it: SISS]
Istat	Istituto nazionale di statistica (National institute for statistics)
LAP	Local Area Plan [it: PDZ]
LP	Legge provinciale (Provincial Law)
LR	Legge Regionale (Regional Law)
LUS	Lusevera (Toponymy)
MIS	Management Information Systems

MIU	Maintenance-In-Use
MON	Monfalcone (Toponymy)
MOR	Mortegliano (Toponymy)
MSAD	Management SAD (application)
MSE	Multi-Sited Ethnography
N/A	Note of the author
NIM	Nimis (Toponymy)
Non-PAI	Senza PAI [see en: Non-PCP]
Non-PCP	Without PCP (DSF section for recording counselling meetings only) [it: Non-PAI]
NSSIS	National Social Services Information System [it: SINSA]
OL	Obiettivo Lavoro – special project for clients inclusion in the labour market
PAI	Piano di Assistenza Individualizzato [en: PCP]
PAT	Programma delle Attività Territoriali [en:THP]
PBS	Practice-Based Studies
PC	Personal Computer
PCP	Personal Care Plan [it: PAI]
PD	Participatory Design
PDZ	Piano di Zona [en: LAP]
PN	Pordenone (Toponymy)
PSC	Psycho-Social Counselling - DSF intervention category
PSF	Paper Social Folder [it: CSC]
PST	Psycho-Social Treatment - DSF intervention category
REA	Reana del Rojale (Toponymy)
SAD	Servizio di Assistenza Domiciliare [en: HCA]
SE	Social Evaluation – DSF intervention category
SINSA	Sistema Informativo Nazionale Socio-Assistenziale [en: NSSIS]
SISS	Sistema informativo sui servizi sociali
SISS	Sistema Informativo sui Servizi Sociali [en:ISSS]
SISTAN	Sistema Statistico Nazionale (National statistic system)
SSP	MON application
SSP	Servizio Sociale Professionale
STS	Science and technology studies
SW	Social Worker [it: AS]
T/A	Traslation of the author
TAR	Tarcento (Toponymy)
THP	Territorial Healthcare plan [it: PAT]
TOL	Tolmezzo (Toponymy)
TS	Trieste (Toponymy)
UD	Udine (Toponymy)
UD	Udine (Toponymy)
URL	Uniform Resource Locator
UVD	Unità di Valutazione Distrettuale (District Evaluation Unit)
WRD	Welfare Regional Department

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