

Improving Infrastructures by Transforming Narratives

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ABSTRACT

In this contribution we are introducing the method of Narrative Transformation by first outlining the contexts for which Narrative Transformation is useful, then describing how to proceed and, finally, reporting from practical experiences with Narrative Transformation.

INTRODUCTION - IMPROVING INFRASTRUCTURES, PURSUING INTERESTS

In this contribution we are introducing the method of Narrative Transformation. It is a method supporting in formal groups interested in further developing their infrastructures in a direction that is beneficial for them. We are first outlining the contexts for which Narrative Transformation is useful. Then we are describing how to proceed. Finally, we are reporting from practical experiences with Narrative Transformation.

When computer applications are developed the »circumstances around« - such as power structures, interests and purposes - become objectified in them. If the computer applications become employed, individuals locally and subjectively appropriate them. Possibly, a spectrum of their potentials is discovered. If this is the case, these discovered possibilities bring about real practice with the computer applications. According to the location, situation, constellation, etc., computer applications are adapted and transformed into a currently appropriate means, hence further developed. (Accounts and theories of these processes are to be found in references as diverse as Leontyev, e.g. [7, 8], Latour and co-workers, e.g. [1], Suchman, e.g. [10], Hofmann e.g. [5] and many others.)

An artifact - here: a computer application - usually is only one part of a larger whole. This larger whole has historically evolved and has been shaped by actively intervening subjects. The boundaries between creating computer applications and designing one's everyday (working) conditions by means of these computer applications are blurred: in the course of designing conditions by utilizing

computer applications these applications are further developed. An artifact also usually belongs to a conglomerate of artifacts, resources, practices, etc. that seems relatively self-contained from certain perspectives: an infrastructure.¹ Artifacts of an infrastructure are related to each other through references between their meanings and through practices. Integrating artifacts into already existing infrastructures requires specific practices. Such an integration is by no means immediately and arbitrarily feasible. A new computer application, for example, even when it is »technically« functioning, is not employable out of itself. Its employability in a specific context is closely related with the historically grown infrastructures of this context, including their references and practices. Locally accepted and viable infrastructures interact with infrastructures which are experienced as globally accepted and valid. This has to be regarded when trying to understand infrastructures in their specific meanings. Tracing their current references and reconstructing their historical trajectories helps appreciate their specific potentials.

The question we are addressing in this contribution is: How can we contribute meaningfully to the creation of an infrastructure that is really beneficial for us? Before introducing the method of Narrative Transformation which we invented as a means to meaningfully contribute to the creation of infrastructures we first have to explore the "we" whose desire is to contribute.

Whether or not »standard interests« in »standard constellations« have ever existed - the standard ways of representing interests seem to have become obsolete in many settings, for example union representation in New Economy organizations (cf. [12]). Identifying one's interests, articulating them and pursuing them have become success factors, not only in the New Economy. The importance is indicated through the huge market for coaching, supervision, negotiation training, mediation and the like. In many societal fields - such as education, research, social work, information technology, gender relations - people

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¹ For the term "infrastructure" cf. [11]; for infrastructures as encountered from individual perspectives, situations and positions cf. [6], p. 359ff.

gather in specific groups for maintaining and improving their working capacity. These groups have to be composed of the right people. Work related issues in need of clarification are discussed and appropriate approaches are collectively elaborated. Participants try their viability and beneficiality at work and possibly discuss the results of these attempts in the group, they collectively further develop their approaches, and so forth. On the one hand, these groups are highly relevant for their participants' work lives. On the other hand, they are formed beyond their members' work lives and in a sense are »orthogonal« to their everyday lives. The groups are based on a common objective, interests that are perceived as shared, complementary or converging (even though specific interests are collectively to be reconstructed), trust, the absence of perceived hierarchy of dependence, and rules and assurances (e.g. regarding the secrecy of the discussed issues). These groups hence are protected spaces for experimentation much more than the work settings of the participants. Especially the hypothetical pursuit of interests and steps toward improving the members' work lives are possible. *Narrative Transformation* provides a framework for *proceeding* in this kind of group when the objective is the *improvement* of their members' *work infrastructures*.

NARRATIVE TRANSFORMATION - THE METHOD

Narrative Transformation is rooted in the participatory action research programme of Critical Psychology (cf. e.g. [6], chapter 9) and its episode-based variation of Memory Work (cf. e.g. [3]). Like many participatory design action research approaches, Narrative Transformation is a framework in which research and change - here: the (re-) design of infrastructures - build a unit and in which the participants themselves are the researchers and change agents. In this section we are depicting and explaining the activities comprised in Narrative Transformation.

First, the Narrative Transformation *group has to be established*. Then, the *common objective* within the field of infrastructure improvement has to be *formulated* in a first version, e.g. improve groupware use; design a new computer application. During the Narrative Transformation process, it very likely becomes necessary to revise and newly formulate the collective infrastructure improvement objective. During the entire Narrative Transformation process the participants *acknowledge already existing results* relevant for their objective, e.g. from research, development, discussions, etc. and compare them with their own preliminary results. At some point the common objective is so clear and focused that all participants can remember pertinent encounters. They all individually write them down. For *writing* these *episodes*, practitioners of Memory Work (e.g. [4], p. 135ff) recommend to (1) write

episodes with a defined beginning and end, (2) write in the third and not in the first person ("When she once...") and (3) restrict the length of the episode to one page.

The *collective analysis of the episodes* comprises the *analysis of the individual episodes* and *comparisons*. For the analyses, *dimensions* are at first *generated and assembled*. For this first set of dimensions the Memory Work literature (e.g. [4], p. 135ff; [2], p. 147) contains recommended dimensions such as plot of the episode, self-construction of the author, constructions of other actors and relationships, contradictions, clichés and remarkable expressions, emotions and implicit theories. On a sentence-to-sentence basis the group examines whether the episode contains content regarding each dimension. The content and comments are written down. Wall charts are suited here for visualization purposes and can be used instead of taking minutes. According to the episode, objective, group, interest, focus, etc., further dimensions are introduced for the analysis. In Narrative Transformation infrastructure related dimensions are vital. In the course of the single episode analyses and comparisons, further dimensions might be added while others might be dropped. The dimensions of the analysis should be an objective of collective reflection in its own right. Categories are essential for analysis and design, yet they often do not become explicated, either because they are not conscious or because they seem to be too obvious and self-evident to be articulated. Conscious analysis always comprises explicating or generating the very dimensions of the analysis. In this way participants get to know each others' guiding categories including their political dimension [9]. The categories are then amenable to change if they prove to be dysfunctional. The *comparisons* may follow the dimensions generated and used so far; new dimensions might again be introduced. The results of contrasts can be manifold: sameness, complementarity or contradiction might become apparent.

Analyzing the episodes ideally provides clues for the *constructive activities* that are to follow. As soon as the participants have an understanding of situations worth improving, new modes of shaping them and acting in them are to be invented and collected. Especially new artifacts and (constituents of) infrastructures are to be conceptualized and realized. One of the many possible approaches here is to write new episodes, e.g. describing viable modes of dealing with problematic situations. These follow-up episodes do not necessarily have to be based on recollected encounters but may also be fantasized scenarios. They might for example contain hypothetical solutions for problem situations in the original episodes or they might especially underline the potentials of certain successful practices described in the original episodes. Further constructive activities such as the *experimental*

creation of artifacts, e.g. mock-ups or prototypes, might be pursued during, as part of or after analyzing episodes. *Trying out* the newly created or harnessed possibilities in the group and at work is an essential part of Narrative Transformation. The gained *experiences are fed back* into the group. Building on the gained results depending on the needs of the group members, Narrative Transformation activities may be resumed.

Practitioners of Narrative Transformation are encouraged to *adopt and integrate other suitable approaches*. The approaches and activities to be integrated into the Narrative Transformation process might originate from the most diverse fields of theory and practice, of research and development, such as Participatory Action Research; Participatory Design, e.g. the Future Workshop, Organizational Games, Simulations, use of mock-ups, prototyping, drama techniques, video-based techniques, work with metaphors and use of photographs; participatory planning; Requirements Engineering; design and modeling of computer artifacts; Software Engineering; creative problem solving; mediation; group dynamics; supervision; and methods from the social sciences, e.g. discourse analysis, contrastations of texts (such as an episode as contrasted with a speech by the president of the author's company toward the shareholders).

All methods under the umbrella of Narrative Transformation should be employed *within the group* and not as research/design procedures about/for other people.

NARRATIVE TRANSFORMATION - AN EXAMPLE

The *group of participants* for this example comprises four persons who are involved in CSCW and PD research: a PhD student who commutes between Britain and Germany and two research assistants and a research scientist who work at a large institute for applied information technology. (The authors are among the participants.) The students and the research scientist are part of a larger research group and collaborate closely. The group belongs to a larger informal alliance of young researchers and friends interested in research. They discuss work-related issues, for example in a bi-weekly reading group; in communications about their theses, research papers, and research ideas and plans; and in informal discussions about their lives as (becoming) researchers, everyday activities related to research, procedures, grant writing, job perspectives, technical support, etc. These discussions take place in face-to-face meetings, on the telephone, in telephone conferences, via email and by using the BSCW shared workspace system (see <http://bscw.gmd.de/>).

The *four episodes* with which the Narrative Transformation process began and which are to be discussed here were written in summer, 2001. The aim of the process is twofold:

(1) The participants wanted to try the procedure and find out whether it was useful and how it might be improved or modified for future use. (2) They want to use the procedure for understanding and improving their work infrastructures. The four episodes were analyzed, and, as part of the Narrative Transformation work process, new episodes were written. The topic on which the participants had agreed was "An event in my everyday research work". The summaries of the episodes are:

Episode 1 (E1) "Mister Anywhere": The author packs for a business trip to visit his dissertation supervisors abroad, uses his checklists and does chores and errands. He ponders upon many things related to the trip, looks for things and tries not to forget anything that might be important. While doing this, he thinks in associations.

Episode 2 (E2) "Logo? Logo!": The author receives an email in which project partners from another research group express their confusion that nobody in his research group contributed to the logo contest they had agreed to perform. He asks himself how this could have happened, even though the planned procedure made so much sense, was easily feasible and was appropriately supported by technology. He blames himself and eventually returns to his agenda for the day.

Episode 3 (E3) "A day in my research group": Back from school today the author turns to his work for the research group. He finds out what he has to do today and then does it. He does not work in the office because he lives in another city. In order to find out the next tasks from home he first looks in the BSCW workspace and then calls his colleague. They have intense discussions in which he learns a lot. Afterwards, he quickly takes a few notes. Before turning to other activities in other areas of his life, he notices a prompt feedback email from another colleague. That feels good.

Episode 4 (E4) "All for all? All for one?": In the research group they had previously agreed to discuss on a weekly basis their theses, research papers and work on discursive design. An important paper the author wrote in preparation for her dissertation could not be discussed in the research group for a long time and for various reasons. At last, the author discusses her text with three colleagues in two-by-two meetings and gets valuable feedback.

From the Memory Work literature mentioned above we agreed to use the *standard analysis dimensions*. Before the analysis we already agreed to *add* the dimensions of (1) questions, e.g. regarding the context of the episode, and first collective answers and (2) production and use of technology. In the course of the analysis of the individual episodes we *additionally introduced* and used the dimensions of (3) utilization and further development of work relevant resources, including explications on what the

resource is for, what it renders possible (or is supposed to render possible) and in which relations it is situated; (4) aspects of the situation in need of improvement, respects in which they were in need of improvement, plus collective ideas for the improvement of the situation; and (5) good practices, situations they referred to, respects in which they were good and what they achieved. While the participants used the dimension "production and use of technology" they realized that this dimension was definitely not sufficient for capturing the important issues related to their infrastructures, for example in their evolution, wealth of meanings and references, connectedness and enabling character for specific practices and results. Yet, they hesitated to just include a category "infrastructures". It seemed so much more to the point to explicate resources at work, what these resources served for, what they enabled and in which relations they were situated. The participants discovered their implicit hypothesis that infrastructures have the character of enabling resources and that infrastructures should be framed, considered and captured from the perspectives of individuals, from their positions and in their situations as suggested by Holzkamp ([6], p. 359ff).

We are arranging the topics and preliminary results that crystallized in the analysis of these four episodes into the rubrics of *division of work and cooperative structure*, *work routines*, *personal accountability and self-organization*, *sustainable work practices* and *making sense of infrastructures, inhabiting common information spaces*.

The *division of work and the structure of cooperation* in the participants' contexts is a big topic in the episodes, for example: (1) Research group meetings do not take place as agreed. The author of E4 hence initiates feedback meetings for her paper in alternative and changing constellations. (2) The author of E3 who mostly has to work remotely from home needs minutes, to-do lists and agendas in order to contribute to the research work. Sometimes minutes, etc. are in the BSCW workspace, sometimes he has to call a colleague to get the current state of affairs and find out his tasks. Common planning tools such as shared checklists would be helpful here. Even BSCW use standards might improve the situation. Face-to-face meetings, telephone, telephone conferencing, email and the BSCW shared workspace system are used while various forms of synchronous collaborative technology - such as application sharing, chat, audio or video conferencing - are not yet used. However, technical support would not in itself provide the solutions. In addition, a practice of splitting up larger tasks and allocating the sub-tasks to individuals would be helpful. This is a matter of conscious and agreed-upon use of the obviously little time, focusing on certain objectives, necessarily at the expense of others, hence of the clarification of research priorities. It is also a matter of

acknowledging that the work is geographically distributed as soon as one colleague has to work from another city. Individually and collectively clarifying, articulating and continuously examining interests and aims, capacities and limits helps to be reliable for others and prevents oneself from making unrealistic commitments. This becomes especially obvious in E2 where a clear agreement had been arrived at for generating a logo for which an enjoyable procedure was invented and initiated supported by the creative use of an available and appropriate technology, the BSCW system. Yet, the process did not work without persons signing up and taking responsibility for sub-tasks.

It turns out that the individual authors have formed *work routines* that are functional in many respects, e.g.: (1) In E2 and E3 the authors describe themselves as regularly checking and writing emails and often looking in the BSCW system. (2) The author of E3 has routines of finding out what his tasks are and prioritizing them. (3) In E1 and E3 the extensive and successful use of checklists is described. (4) In E3 the common habit of writing agendas and minutes of the weekly meetings and making them accessible to all group members in a BSCW workspace is referred to. (5) E3 is about the habit of discussing theses, papers and PD procedures on a weekly basis. (6) In E3 and E4 habitual work-related telephone calls are mentioned. (7) All episodes contain sections about the desirability and practice of commenting on each others' work, especially paper drafts. Yet, the need for the establishment and improvement of more and other routines is also obvious, for example: (1) The minutes in E3 that are accessible via BSCW are not complete and the author has to call his colleague. (2) For a long period of time the meetings agreed upon in E4 could not take place. (3) The deadline for the logo search contest in the meeting minutes in E2 does not warrant anybody to contribute to the process. In any case, work routines have not only to be established and practiced but also to be continuously examined regarding their suitedness, for example: (1) In E3 the author would have needed all minutes, including all task allocations, from the last meeting; the habit to call his colleague in such cases is not the worst substitute. (2) In E4 an alternative to the meetings agreed upon is so necessary and urgent that the author enforces a new practice of meetings in other constellations than originally planned. (3) The situation of not having contributed to the logo search process in E2 would not have occurred had the group had a habit of delegating the logo creation to a professional logo designer. Meta-routines for repeatedly examining and revising routines have to be established.

All episodes contain allusions to *personal accountability and the individual and collective organization of work*, for example: (1) In E1 and E3 the authors are keen on not forgetting important things and tasks. (2) In E2 the author

regrets his and his research group's unreliability. (3) The author of E4 finds herself in a situation where an important agreement cannot be followed by her colleagues. Again, good use practices for the use of already available technologies such as telephone, telephone conferencing, email and BSCW and additional technologies such as electronic checklists and synchronous cooperation support provide chances for improvement. And again, conscious practice regarding the division of work, the collaborative structure, the use of time, research priorities and geographical distribution is necessary.

All episodes somehow contain allusions not only to the desire but also to the realization of work practices that guarantee rest, recreation, the further development of one's working capacity and enjoyable work results and processes (*sustainable work practices*), for example: (1) The author of E1 mentions the necessity to sleep and resume the preparation for his business trip the next day. He also cleans his home and workplace before his trip, which means that he can feel comfortable when he returns. (2) The author of E3 mentions that he cooks dinner after work. (3) In E2 the author tells himself to return to his agenda for that day instead of remaining in his mood of anger and disappointment. At various points enjoyable work practices that bring about good results are mentioned, for example: (1) the long and interesting telephone conversations in E3 and E4; (2) the playful utilization of resources: instead of disappointment about the repeatedly cancelled group meeting the author of E4 initiated enjoyable and constructive two-by-two meetings; and (3) in E2 the logo contest including a bottle of champagne as an incentive is a playful and enjoyable procedure. Some of the sustainable work practices in the episodes seem to rely on the absence of hierarchy or at least require extreme mutuality, e.g. in the followed research interests or regarding honesty.

In some cases, the attempts of utilizing (making ready-at-hand) and *making sense of the present infrastructures* - of *inhabiting common information spaces* - fail. This is for example the case in E2 where nobody took the time to contribute to the logo contest. Obviously, pertaining routines, a division of work and the allocation of responsibilities were missing. In other cases the utilization of existing infrastructures was partially successful. This is the case in E3 where some minutes and results are in the BSCW workspace while others are missing. Rules, routines, conventions and/or commitment would have helped. In cases of imperfect collective utilization of resources, alternative means and practices are necessary, for example: (1) The author of E3 calls his colleague after he was not able to figure out his tasks from the materials in the BSCW workspace. (2) After a long time of waiting for a group discussion to take place, the author of E4 eventually sought exchange in other, currently viable constellations.

FUTURE PERSPECTIVES AND CONCLUSION

Obviously, Narrative Transformation was viable so far and brought about useful results. The participants have established a design practice in its own right. It should be mentioned that this inquisitive, instructive and constructive process has been enjoyable. Formerly an abstract concept, the term "infrastructure" has become a lively guiding category. The group has already written follow-up episodes, installed groupware and tried new cooperative practices. Participants have not yet engaged in PD activities such as mock-up design and activities from Software Engineering, Requirements Engineering and Participatory Design. They have been in the process of deriving practical ideas from the episodes and experimenting with the preliminary results. It turns out that the attempted improvement of infrastructures is strongly related to the desired achievements of the participants and with the cooperation modes - practices, structures, etc. - that are feasible in their settings. Without explicating the desired achievements and realistic modes of cooperation, attempts at improving infrastructures are pointless.

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