

# Breakthrough by Breakdown: Metaphors and Structured Domains

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# BREAKTHROUGH BY BREAKDOWN\*

Metaphors and Structured Domains

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## Abstract

In the daily situation of work, the members of an organization usually act without the need to disengage and reflect on their own tasks. But, in the design situation, it becomes important to talk about and reflect on the work. Moreover, it is crucial to set the proper structured domain appropriate for computerization. The message of this paper is that a breakthrough in design may be achieved by conscious use of metaphors. Metaphors may be used to break down the unreflected being of the members of an organization and metaphors may be used for setting of structured domains appropriate for computerization. The basic idea is to understand the organization in terms of other phenomena, whereby knowledge about these phenomena becomes a potential source of inspiration for designing new options. The paper builds its argument around a practical example as well as theoretical work on design and metaphors. The paper is concluded by a set of guidelines for metaphorical design.

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# 1 Introduction

In this paper we start out from the observation that identification of what goes on in organizations is an important and complex task. As a motivation consider the following small example.

The clerical workers at a social services department, when asked what their work was, once responded: “we are only typing the scripts”. They actually were doing a number of other tasks : connecting calls to the proper department, informing clients about the status of their cases, arranging meetings etc. If we take the first answer as the whole truth of what the clerical workers are doing then the only relevant domain for computerization is document preparation and a word processing system is the proper kind of computer application. But other domains may be relevant, the clerical workers may, for instance, be seen as acting as mediators and then the proper kind of computer application would be a computer based calendar and a journal easing access to the status of cases.

In the daily situation of work clerical workers usually act without the opportunity or need to disengage and reflect on their own tasks. Moreover, it is by no means easy to find the proper domain of activity appropriate for computerization.

The perspective of this paper on human activity and design was formed by Winograd and Flores [13]. Following Winograd and Flores, we want to stress the important, but often disregarded issue, of how to find the proper domain. We have picked up the challenge of not simply creating tools that reflect existing domains, but to provide for the creation of new domains [13].

We point out that a breakthrough in design may be achieved by conscious use of metaphors. Metaphors may be used to break down the unreflected being of the members of an organization and metaphors may be used for setting of structured domains appropriate for computerization. Within linguistics, it is well-known that the use of metaphors is a powerful way of seeing reality in a new way [8]. The relevance and usefulness of metaphors for design in general has been proved by Schön [12], and the relevance for design of computer based systems have been stressed by Lanzara [9].

The idea of using metaphors in domain setting is elucidated conceptually, empirically, theoretically and normatively in the following sections. In section 2 we introduce the *basic concepts*: breakdown, structured domains and metaphors. In section 3 we use three different metaphors to identify three different structured domains within an organization; this section is *empirical*. In section 4 we characterize metaphorical design; this section is *theoretical*. In section 5 we present a set of guidelines for metaphorical design; this section is *normative*.

## 2 The basic concepts

The first part of this section introduces the concept of structured domains and the concept of breakdown. By means of these two concepts we later on elucidate what metaphors can be used for in design. The other part of the section introduces the concept of metaphor itself.

### Breakdown and structured domains

The following introduction to *structured domains* and *breakdown* draws heavily on Winograd and Flores [13]. Although in this paper we use the two concepts in the same sense as in [13], we are not, due to lack of space, able to give a presentation as thorough as the one in Winograd and Flores.

Within an organization you may identify various domains of activity or *domains*. Within a library, for instance, typical domains are:

- *The domain of accession:*  
Mainly the staff but also the borrowers make proposals for which books to buy. On book selection meetings the staff discusses which books to buy. The staff gives orders to the bookstore on the selected books. The books are received and distributed to other parts of the library. The staff keeps the various accounts and handles the invoices.
- *The domain of information retrieval:*  
The staff and the borrowers use the catalogues. The borrowers may do it on their own or in collaboration with the staff. The staff has knowledge about the catalogues, the subjects, the book stock, etc.
- *The domain of circulation control:*  
Lending and return of books are registered. Overdue notices are issued and fines are collected when overdue books are returned.

Within a certain domain, some, but usually not all activities, may be well-structured and formalizable. Such activities form what we call a *structured domain* and may be computerized.

Within the domain of accession, invoices are handled in a well-structured way and the amount on each account is, obviously, formalizable. Conversely, the selection of books does not form a structured domain. The quality of books is not formalizable and it is not possible to select books based only on well-structured and formalizable criteria.

Let us consider, in more detail, the use of the information retrieval system at a library. Quite often the borrowers pose questions somehow outside the scope of the cataloguing and classification system. The borrowers may ask: "I'm looking for a book about the composer of Elvira Madigan", "Has Columbo written any books" or "I need a book

about Chernobyl”. The first time each of these questions is posed, the fluid performance of the librarian is interrupted and detached reflection becomes necessary. Based on the recurrent pattern of situations like these, the librarians have made what they call a ‘cheat file’ which is a notebook in which they keep the answers to questions outside the scope of the present catalogues. In terms of Winograd and Flores [13] the previous sentence may be rephrased: The first time each of these questions is posed, the librarians face a *breakdown*, but based on the recurrent structure of breakdowns the librarians have made a ‘cheat file’.

According to Heidegger’s original concept of breakdown, the fundamental condition of being is to have access to the world through practical involvement; one is acting unreflectingly without having representations of things,– the situation is *ready-to-hand*. Objects and properties are only inherent in events of *breaking down* in which the situation becomes *present-at-hand*. The point is clarified by one simple example (originally due to Heidegger but here quoted from Winograd and Flores, [13] p. 36):

“One simple example he gives is that of a hammer being used by a person engaged in driving a nail. To the person doing the hammering, the hammer as such does not exist. It is part of the background of *readiness-to-hand* that is taken for granted without explicit recognition or identification as an object. It is part of the hammerer’s world, but it is not present any more than are the tendons of the hammerer’s arm.

The hammer presents itself as a hammer only when there is some kind of breaking down or *unreadiness-to-hand*. Its hammerness emerges if it breaks or slips from grasp or mars the wood, or if there is a nail to be driven and the hammer cannot be found”.

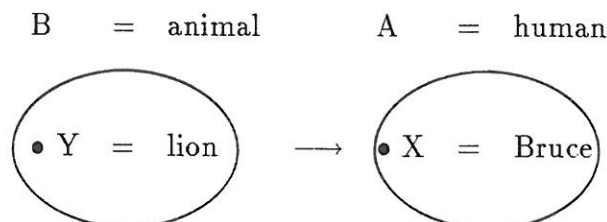
In situations of breakdown conceptual distinctions become relevant, some of which are new ones. For instance, in the information retrieval case, the title of a movie is used for the title of the theme song of the movie; the name of the part is used for the actor playing the part; and the name of a city is used for a current event. The recurrent pattern of breakdowns leads to the setting of a new structured domain, and a possibility for computerization emerges.

## Metaphors

In Lakoff and Johnson, [8], the essence of metaphor is understanding and experiencing one kind of thing in terms of another; for instance you may understand a mountain as a human, e.g. “The foot of the mountain”. In this sense of metaphor a phrase like “inflation is lowering our standard of living” is also metaphorical because inflation is understood as an entity. A more strict or restricted understanding of the metaphor concept may be found in [1]:

“A metaphor is an utterance where a concept X is assigned to the main category B of another concept Y. B must be a major linguistic category like animate, inanimate, human, animal, plant, physical object etc. In its literal sense, X must belong to A that is disjoint from B”.

For instance, the phrase “Bruce is a lion” is metaphorical because Bruce (a human) is assigned to the main category of lion (animal):



What you consider as a metaphor depends on what is meant by major linguistic categories. In this paper we adopt the looser definition found in Lakoff and Johnson, [8]. We do not want to go into a linguistic discussion about metaphors, we only want to exploit the idea of consciously *seeing* one thing *as* another thing. In the more extreme cases of big similarity you see one situation as another similar situation. For instance, the obvious way to think about diving is that you jump into the water. If you think in this way you normally don’t make a pretty dive. Alternatively you may think: don’t jump into the water, but watch the horizon and fly towards the horizon<sup>1</sup>. By doing so you see the situation of diving as another situation – you use what Lanzara calls a different frame [9].

We now turn to the issue of why metaphors are used when understanding computer systems. First of all we note that Lakoff and Johnson [8] have documented that metaphors in general pervade our entire language. We understand the less clearly delineated in terms of the more clearly delineated; consider the example:

- I am in the kitchen
- Now I am in the circulation control system

In the first sentence ‘in’ is used in the literal sense whereas the second sentence is an instance of the physical space metaphor where the less clearly delineated computer system is understood in terms of a concept normally used about a physical space.

An investigation, [10], of the professional language at a Danish library has documented that the computer system is understood in terms of at least three metaphors,– the physical space metaphor, the communication metaphor, and the organism metaphor. Typical examples are: “then I have to go back to the ALIS-Base” (the physical space metaphor), “then I say find” (the communication metaphor) and “the system has done what I expected it to do” (the organism metaphor). Similar kinds of metaphors are intensively, but mainly unconsciously, used by computer professionals. Metaphors have in a number

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<sup>1</sup>The example is due to G.F. Lanzara.

of cases been used consciously in the design of computer system, the design of the Xerox Star being one of the most well-known cases. The Xerox Star is understood in terms of physical concepts like “documents”, “folders” etc.

In general, you may use metaphors to understand one kind of experience in terms of another. By seeing X as Y you draw advantage of some of the knowledge you have about Y. Metaphors may be used to perceive a situation in a new way and hereby to provoke invention. But you highlight some aspects and hide others. Therefore, the choice of metaphor is important.

### 3 Metaphors, a tool for breakdown

In this section we demonstrate how metaphors can be used to *provoke* breakdowns and hereby contribute to the identification of structured domains.

Good service is one of the major goals of most libraries and the reason for introducing computers is often claimed to be the desire to improve service. When asked, the librarians often pose general statements like, “good service is when the books are found and delivered quickly”. It is striking to notice that despite being proficient in offering good service, the librarians have difficulties in talking about good service. During the regular workday at the library, the situation is ready-to-hand, the staff doesn’t need *talk* about service, they simply provide it. But if you want to improve the service or discuss the impact of computers on the service, then it becomes important to have the situation present-at-hand.

In order to uncover the concept of service in relation to the use of computers we now introduce three metaphors for a library. The three metaphors are ‘the warehouse’, ‘the store’<sup>2</sup> and ‘the meeting place’. Based on each of the three metaphors we give an account of what is going on in a library emphasizing the aspects of service and the use of computers<sup>3</sup>. Each of the three metaphors provokes different breakdowns; different distinctions lead to the setting of different structured domains and thereby different computer applications.

#### The warehouse metaphor

Seen as a warehouse, the library is primarily a place from which books and other publications are supplied. Seen from this point of view the following distinctions come into focus:

- stock in trade (book stock)
- order (requisition)

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<sup>2</sup>We use the American English language (warehouse and store) and not the British English language (store and shop).

<sup>3</sup>The presentation is based on investigations of the service aspect within a technology assessment project at the Danish University libraries [6].



- loss (lost books)
- stock taking (revision)
- purchase of goods (accession)
- delivery of goods (lending of books)

Seen from this point of view the most important tasks of the library are to be able to find the goods quickly, to have precise knowledge of the stock and to avoid loss. Evident structured domains are accounting, retrieval of books, registration of lending, etc. A good computer system is one that makes it possible to keep track of the stock, e.g. to know which books are in the library, to find a book efficiently and to avoid the loss of books. The existing use of computers (accession systems, information retrieval systems, circulation control systems etc.) is based mainly on an understanding of the library as a warehouse.

## The store metaphor

Seen as a store, the library has many similarities with the library seen as warehouse. We introduce the store metaphor because we want to focus on the relation to the customers. Important distinctions are:

*Activities directed towards the customers:* The relation to the customers is established and maintained in a number of ways: market analysis, marketing, etc. Moreover, the quality of the service is dependent on how the customers are being served or perhaps have to serve themselves.

*The type of store:* The department store has a broader assortment than the retail store, on the other hand the number of trademarks might be smaller in the department store than in the retail store. In a “convenience store”, such as 7-Eleven, there is a limited assortment of goods in exchange for a convenient location.

*The relation to other stores:* The service is dependent on the relations to other stores. The stores may be organized in a hierarchy of a principal department and a number of branches, or the stores may be organized as chain stores, or the store may be independent.

Seen as a store, the most important task of the library is to offer good service, either by having the staff serving the customers or by creating proper conditions for having the customers serving themselves. Evident structured domains are: supplying of information about available goods; supplying of information about goods obtainable from other stores; and, not to forget, information about the goods themselves. A good computer system is one that assists librarians serving borrowers or makes the borrowers able to serve themselves. The existing use of computers supports the hierarchical relations among the libraries; alternatively computers could be used to combine the advantages of the warehouse kind of library, the “convenience store” kind of library, and the retail store kind of library; for instance by using computers as a mediation technology between the different kinds of libraries.



## The meeting place metaphor

In the following we see the library as a meeting place for people where conversations take place about books and other subjects related to books. The conversations can for instance be about:

- which books are available at the library, especially new books
- reviews and comments on books
- meetings, talks and seminars where the books are used
- lists of synonyms, which have been useful in information retrieval

The conversations may be

- between the staff and the borrowers
- between the borrowers
- between the library staff
- between the library staff from different libraries.

If we see the library as a meeting place where conversations take place, then computers can be used in the following way. Within a specific field (e.g. a research project or a series of seminars) a group of borrowers and librarians use the computer as a medium for some of their conversations. The system may have the following subparts, each corresponding to a structured domain:

- a *news catalogue*, which the library staff uses, when referencing new books.
- a *review catalogue*, which is used by the staff and the borrowers to communicate reviews.
- a *calendar*, which could be used by the group to announce meetings, talks, seminars etc. where specific books are relevant.
- a *synonym list*, which could be used to communicate successful search profiles.

Seen as a meeting place, where conversations take place, the most important task of the library is to create better conditions for communication. First of all, it is a matter of what the conversations is about, then you can discuss the proper technical remedies. A good computer system is one that can be used as a medium for written conversations and one that can effect contact among people and thereby create possibilities for oral conversations.

The library staff may take part in the conversations and act as *consultants* for the group members. As consultants they may, for instance, collect and edit information about

literature. Moreover, a task as consultant could be to effect contact between groups within related fields.

In this section we have seen how metaphors may be used as a tool to provoke breakdowns,

“By this (breakdown) we mean the interrupted moment of our habitual, standard, comfortable ‘begin-in-the-world’. Breakdowns serve an extremely important cognitive function, revealing to us the nature of our practices and equipment, making them ‘present-to-hand’ to us, perhaps for the first time. In this sense they function in a positive rather than a negative way.

We have seen how different objects and properties emerge in different kinds of breakdown. The different distinctions lead to the setting of different structured domains.

## 4 Literal and metaphorical design

In this section we characterize the use of metaphors for setting of structured domains. This kind of design we call *metaphorical design* as opposed to conventional design which we name *literal design*<sup>4</sup>. Our intention in this section is to promote the idea of metaphorical design, not as an alternative but as a supplement to literal design. Metaphorical design should mainly be used in the first part of the design process to create fantasy and new imagination about potential structured domains. After the metaphorical part of the design process, literal design dominates and the ideas from the metaphorical part are brought down to earth.

The relation between metaphorical and literal design is like the relation between reading a novel and leading ones life. When you read the novel you do it within the background of the previous part of your life, and by the time you have read the novel you may have changed the way you want to live, but you do not take the novel as a literal prescription of how to live. Metaphorical design is in a similar way intended not to be a coherent part of the final design but to inspire and create ideas about how the final design could be.

As a way of presenting the characteristics of metaphorical design we contrast it with literal design. To clarify our message, we draw, from time to time, a somewhat simplified picture of the two kinds of design – in reality, you may find aspects of literal design in metaphorical design, and vice versa.

In *literal design* the structured domain is more or less known in advance, e.g. the circulation department administrates lending and retrieval of books, etc. In *metaphorical design* the structured domains are put into question and searched for, e.g. the meeting place metaphor is used to question the prevalent perception of what the relevant structured domains are. New structured domains are generated, such as the handling of synonym lists.

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<sup>4</sup>The idea of metaphorical design as opposed to literal design was originally conceived in discussions with Peter Bøgh Andersen, Department of Information Science, Aarhus University, Denmark.

In *literal design* you understand the organization in terms of concepts normally used in and about the organization in question, e.g. a library is understood in terms of borrowers, borrowers cards, circulation, etc. In *metaphorical design* the organization is also understood in term of concepts from a domain distinct from the domain in question, e.g. a library may be understood and seen as a meeting place as we saw in one of the previous sections, the relevant concepts may then be conversations, contact, mediation, consultants, etc.

*Literal design* is more like faction<sup>5</sup> than like fiction. The computer system to be designed is seen as a model of the real world, see for instance [7] . Often the implicit design goal is to have the system resemble the real world as much as possible. *Metaphorical design* is more like fiction than like faction. The metaphorically designed system is seen as an imaginary artifact that inspires for new ways of using computers. The meeting place metaphor changes the role of librarians and the perception of what a library is and of how computers may be used.

*Literal design* is problem solving. The problem to be solved by computerization is known from the outset, e.g. the problem at a library being too big a delay from the time a book is ordered until it is made accessible for the card holders. In the literal design process various design solutions are set up and according to objective goals and purposes the optimal design solution is chosen. *Metaphorical design* is problem setting. The problem to be solved is not known beforehand and the identification of the problem to be solved is taken as an explicit part of the design process. The meeting place metaphor is intended to be used for uncovering which of the library's problems should be handled by computerization.

In *literal design* the use of language is based on definitions of concepts and shared understanding of their semantics. Jackson's methodology [7] is based on clear understanding of entities and actions. In *metaphorical design* no clear definition of concepts is made, on the contrary, it can be a virtue to break the rules of language. For instance, the whole concept of a library as well as the role of the librarian are questioned by using the meeting place metaphor.

In *literal design* the aim is to make descriptions which only can be interpreted in one way. Descriptions are a tool for communicating, where the aim is to impart to the receiver the understanding of the sender. In *metaphorical design* the aim is to invite distinct interpretations of the same description. Descriptions are as tools for making provocations.

In *literal design* the descriptions are coherent. For instance, in Jackson "The System Implementation Diagram can be seen as a transformation of the System Specification Diagram" [7] p.54. In *metaphorical design* the set of descriptions made might be incoherent and conflicting. In the example of the library metaphors you have 'a warehouse' with no customers and 'a store' with customers.

In *literal design* analysis of the present organization is distinguishable from 'design' of the new computer application. In Yourdon [14] you have a temporal separation in terms of four phases: "current physical", "current logical", "new logical" and "new physical". In the Mars-project, [2], you have a conceptual separation of analysis and 'design'. Analysis

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<sup>5</sup>Faction is a literacy genre with a strong touch of reality.

leads to an improved understanding of the present organization whereas design consists of the formulation of the vision of the desired change of the organization. A specific activity of a system development process may contribute to analysis as well as ‘design’, but conceptually they are distinguishable. In *metaphorical design* analysis and ‘design’ are indistinguishable. A new use of language creates new phenomena. When you talk about a library as a meeting place, it does not make sense to say whether you focus on the present organization or you create a vision of the desired change.

The previous characterization of metaphorical design may be summarized as:

Literal design	Metaphorical design
<ul style="list-style-type: none"> <li>- structured domains known in advance</li> <li>- concepts used in the organization</li> <li>- like fiction</li> <li>- problem solving</li> <li>- definition of concepts</li> <li>- one interpretation</li> <li>- coherence</li> <li>- analysis and design are separate</li> </ul>	<ul style="list-style-type: none"> <li>- structured domains are searched for</li> <li>- new concepts</li> <li>- like fiction</li> <li>- problem setting</li> <li>- negotiation of concepts</li> <li>- several interpretations</li> <li>- incoherence and conflicting</li> <li>- analysis and design are integrated</li> </ul>

The characteristics of literal design, as stated above, are rather the conventional designer’s perception of the design process than the inherent attributes of conventional design. For instance, we state that literal design is problem solving (as opposed to problem setting) but literal design could, in a fruitful way, be seen as problem setting[9].

## 5 Guidelines

In this section we do not intend to present *the* metaphorical design methodology – no standard methodology exists. Two different reasons may be given for the absence of a standard methodology. Firstly, the notion of metaphorical design is novel, hence, no practical experience has lead to the development of methodologies. Secondly, and even more important, the nature of metaphorical design may not be suitable to the generation of standard methodologies. As an alternative we present a set of guidelines in a rather informal and narrative way.

The guidelines are grounded on a small number of design situations where metaphorical design has been used either consciously or unconsciously. The primary design situations are the one accounted for in section 3 and the ones in [12].

**Tell the stories of concrete situations.** A metaphor often emerges out of the richness of a concrete situation or the alternation between being involved in a concrete situation and reflecting on the situation. The information-richness of a specific concrete situation poses a difficulty. As a technique for catching the information-richness Schön [12] recommends ‘story telling’: By telling the story of your experiences you use the temporal

structure of events to convey the information-richness without being constrained by a fixed set of categories. As a way of stimulating story telling you may ask questions like: “When was the last time you assisted a borrower in a problematic situation?” and “What was the actual course of action in the concrete situation?”.

**Select a generic metaphor.** As a supplement, as well as an alternative to ‘story telling’, a metaphor may be generated by starting out with a generic metaphor, i.e. a metaphor of which you may create more concrete instances. The tool metaphor, or the tool perspective [5], is an example of a generic metaphor:

“More generally we suggest, that to label some means of production as tools should require that they

- are means to fashion material into a more refined product,
- are under complete and continuous manual control of the worker,
- are fashioned for the use by a skilled worker to create products of good quality,
- are extensions of the accumulated knowledge of tools and materials of a given labour process” [5] p. 9.

The tool metaphor has been useful in the development of computer supported page make-up in newspaper production [5].

**Elaborate the triggering concept.** The triggering concept may either be a key concept or a peripheral concept within the target domain or the source domain<sup>6</sup>. In the case of the ‘store metaphor’ the triggering concept (service) is a key concept within the target domain whereas in case of the ‘meeting place’ metaphor the triggering concepts (to meet and have conversations) are key concepts within the source domain. You may trace the triggering concept back to the source domain by asking: In which other domains do we talk about, as an example, service? By asking these kinds of questions you may be led to see the library as a warehouse, a store, etc. In case of the warehouse and the store metaphor we have elaborated the metaphor within the source domain, whereas in case of the meeting place metaphor we have mainly elaborated within the target domain. The metaphor may be elaborated by pointing out the differences between a concept used in the target domain and the same concept used in the source domain.

**Negotiate the key concepts.** The key concepts used in metaphorical design rarely have a fixed meaning. Disagreements or misunderstandings, may, in a fruitful way, be used as a starting point for the elaboration of the metaphor. For instance, one person may say that a librarian is ‘an interpreter’ and an other person may say that a librarian is not an interpreter, because an interpreter translates between two different languages like English and Danish. The disagreement may be dissolved by negotiating the meaning of ‘translating’ and ‘different languages’.

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<sup>6</sup>In the target domain the metaphor is used metaphorically whereas in the source domain the metaphor is used in its literal sense.



**Elaborate the assumptions.** Make clear what you highlight and what you hide. The warehouse metaphor hides the borrowers, whereas the meeting place metaphor highlights them. By clarifying the assumptions you may dissolve disagreements. For instance, one person may claim that the library is a meeting place, and another may point out that it is not; the first person considers the relation between the borrowers as the primary one whereas the second person focuses on the relation between the librarians and the borrowers.

**Restructure the perception of reality.** Be aware of new features and relations, and regroup, reorder and rename those features and relations. In case of the meeting place metaphor you become aware of the relation between the borrowers – the library is regrouped according to subjects, and the librarians are renamed ‘consultants’. What previously was in the background (for instance, the relation between borrowers) comes to the foreground. By renaming you highlight hidden features or create new ones. For instance, by naming the staff ‘consultants’ you stress their role as someone who advises and assists others.

**Tell the metaphor story.** Talk about the target domain as if it was the source domain. In section 3 we have told different metaphorical stories about a library. When telling the warehouse story we have put the library concepts in brackets, when telling the store story, the library concepts are omitted, whereas when telling the meeting place story, concepts from the target and source domain are intermingled.

**Identify the unused part of the metaphor.** A metaphor has an immense richness of features; be aware of how they may be used and how they cannot be used. Clarify the similarities as well as the dissimilarities between the target and the source domain. The better you understand the source domain the better you understand the target domain. Ask questions like: “How is, or isn’t a library a meeting place?” and “What is a meeting place?”

**Focus on the use of computers.** The use of computers within the source domain may be used as a starting point for generating ideas about how computers may be used within the target domain. Some of the benefits within the source domain may be transposed into the target domain, others may not. Ask questions like: “How are computers used within the source domain?”, “Can they be used in a similar way in the target domain?, – why? or why not?”

**Generate conflicting accounts.** The elaboration of the metaphor, and hence the illumination of the situation, may be stimulated by generating conflicting accounts based on different metaphors. As Schön points out:

“As in the Japanese film *Rashomon*, one is apt to be puzzled, disturbed, and stimulated to reflection by the telling of several different stories about the same situation, when each story is internally coherent and compelling in its own terms but different from, and perhaps incompatible with, all the others” [12] p. 267.

Conflicting accounts may be used to stimulate a reflective and critical awareness. At the same time, conflicting accounts *may* reflect the existence of different groups of interest,

for example, the management and the staff at the library.

**Make clear what you are doing.** It is important to make clear that metaphorical design is different from literal design, otherwise you will be met by comments like: “The library is neither a store nor a meeting place, but a library!!!”

**Don’t empty the trash too soon.** Whenever you do metaphorical design you have a huge amount of fragments, odds and ends which might turn out to be useful later on, so don’t empty the trash too soon!

## Postscript

In this paper we have devoted our attention to the use of metaphors for breaking down the unreflected being of the members of an organization, and the use of metaphors for setting of structured domains. But, as indicated at various points, metaphors are powerful tools relevant for the design process in general[9].

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