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# Twelve Steps of GABEKWinRelan

# A Procedure for Qualitative Opinion Research, Knowledge Organization and Systems Development<sup>1</sup>

#### Abstract

This paper gives an overview of the method GABEK and its computer implementation *WinRelan*. The main twelve steps of the analysis of unstructured verbal data are presented. Moreover an insight into theory-related and practice-related aspects of a GABEK*WinRelan* study are discussed.

## Introduction

Knowledge and experience of members of an organization are an important potential. From their experience with daily routine in their working environment, people know about specific aspects of their individual working processes. Since every person within an organization has his/her own knowledge of and experience with specific details, isolated individual knowledge and experiences need to be integrated into a holistic picture of the whole system. In general, individual knowledge is integrated in dialogues between colleagues. However, the usual formal and informal com-municative processes in very large and complex organizations no longer guarantee/warrant coordinated cooperation based on integrated individual knowledge. To investigate the often implicit knowledge of many indivi-duals, we depend on methods designed for the organization, processing and representation of knowledge. The computer supported method GABEK (GAnzheitliche BEwältigung von Komplexität) (©Josef Zelger, Innsbruck 1991–2000) was developed for this purpose. Based on natural language processing of individual statements, GABEK allows for the transparent organization of knowledge. This yields the holistic representation of complex social situations from the perspective of those affected.

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Consequently, it is possible to connect different kinds of knowledge from members of different structural levels of organizations, e.g. the detailed knowledge about working processes of employees and the expert knowledge of decision-makers. Since any social organization is inseparable from the people who work and live in it, it seems especially important to take their knowledge, estimations and opinions into account. They know about specific strengths and weaknesses of working processes, they can suggest realisable improvements and they can estimate advantages and disadvantages of structural changes. The integration of the different points of view leads to effective organizational development in the sense of those affected: working processes, cooperation and services can be improved while simul-taneously facilitating the well-being of employees.

Colloquial statements from open interviews are the basis for a GABEKanalysis. Using the computer program *WinRelan* (Windows Relationen Analyse – © Josef Zelger, Innsbruck 1992-2000.) which was developed for GABEK-applications, the unstructured answers and texts are condensed into a transparent network of opinions, estimations, knowledge about causes and effects, values and emotional attitudes in form of "linguistic gestalten", higher order "gestalten", "gestalten-trees", "causal networks", "assessment profiles", et cetera. Every step of the analysis can be reconstructed and reproduced intersubjectively. Evidence of the methodological validity and reliability is multi-faceted and cumulative across many studies.

With justifiable effort GABEK provides realizable results. Normal working processes remain undisturbed while conducting the analysis. Repeated application helps to evaluate the ongoing development of organi-zations from the involved persons' points of view. On the side of those affected comprehensive information about ongoing processes leads to better understanding of the organization as a whole. It is known from repeated experience that members of an organization readily accept the results of a GABEK-analysis because they identify their own suggestions in the connection with those of others. Therefore, they are motivated to contribute to their realization.

The following advantages of a qualitative study by GABEK in contrast to a quantitative study need to be emphasized. Firstly, open questions leave enough space for the interviewees to say what they really think is important. Secondly, the qualitative analysis allows for transparent processing and interconnection of all answers which, thirdly, leads to a holistic representation of the variety of different statements. Fourthly, the results are formulated in the language of the interviewees which makes them easily acceptable for those affected. Fifthly, the results are represented in a hierarchical order with regard to their relevance for the interviewees. Finally, all results can be retrieved interactively and tested on the computer.

GABEK may be widely applied. In the following an overview over successful applications is presented: Evaluation of the school reform in South Tyrol (Italy); Quality management in a hospital (Italy); Performance tests in a waste disposal plant (Austria); Product development and evaluation in an automobile company (Germany); Conflict management in industrial organizations (South Africa); Social studies in urban districts (Mexico); Dream research: analysis of structures and contents of daydreams and dreams (Austria); Theory development: effects of anxiety on the acquisition of a second language (Austria); Evaluation of didactics in mathematics, psychology, philosophy, physical education, et cetera (Austria); Development of a ,,Leitbild" for a university (South Africa); Organizational development in a university (Austria); Social anthropology: Identity of linguistic groups in South Tyrol (Italy); Ethical problems in medicine (Austria, Georgia, Holland, Ukraine); Customer-oriented market research (Austria).

# **GABEK in Twelve Steps**

Changes in organizations and social systems need to be based on knowledge and experience of the people affected. Thus, a GABEK-analysis should have a broad base: Every group of persons involved in a certain complex of problems should be included in the opinion research. In practice, it might be difficult to include professionals from outside the organization, i.e. suppliers, producers, customers, competitors, et cetera, in the verbal data collection. Despite these difficulties it points out perspectives which are crucial for the success of the suggested problem solving strategies. A broadly designed study not only makes evident common goals and possible means, but also basic values and ethics of the social system and the cultural context. With GABEK it is attempted to initiate means that correspond to the values and goals of the respective social system. Thus, it is an implicit goal of GABEK-projects to improve the unity of a social system.

1. How can we record the rich knowledge potential of employees or people involved and put it to work?

The first answer is straightforward: we ask every individual employee about his/her personal views. In large institutions this can be done anonymously and in writing. In small firms we can achieve this through dialogues and depth interviews. Some *open questions* allow every employee to present suggestions s/he considers important, or to present criticism.

#### 2. How can the many individual suggestions be networked?

First, a comprehensive *index system* covering all answers is introduced. This consists of a formal linguistic network which can be used like a map as a system of orientation for the whole landscape of opinions. The user explores the thematic connections as s/he would routes. S/he works interactively on the screen, reads those texts s/he is interested in, compares them and decides anew which paths to pursue in the opinion network, which evaluation aspects s/he is to choose, which information s/he should blank out or focus on et cetera.

The steps that are necessary for this purpose and further preparatory operations are supported by the program *WinRelan* (© Josef Zelger, Innsbruck 1992-2000) developed by Josef Schönegger and Josef Zelger: The procedures can be learned in a four day training:

Textual input, structuring of sense units, coding in object language, coding in meta-language, creating a list of expressions, elimination of synonyms and homonyms, selection of content trends and weak signals, redundancy analysis, coherence analysis, cluster analysis, creating of linguistic Gestalts, hypergestalten, gestalten-trees, evaluation analysis, causal analysis, relevancy analysis, coding of colours, networkgraphics, simulation of dialogues et cetera.

## 3. How can we build meaningful results from the verbal data?

First, the original answers are organized into meaningful and thematically coherent groups of similar statements. Three to nine statements dealing with a specific problem field or topic are summed up according to specific syntactic and semantic rules. The summaries are semantic implications from the different statements in the text group. We call these coherent text groups together with their summary *linguistic gestalten*. The statements in a text group a linguistic gestalt is based on have to have a related content, but must not be too similar to each other. Rather, they should have a novel-ty value compared with the other statements in the text group. Furthermore, the summaries must be applicable as orientational, explanatory or action patterns.

# 4. How do we obtain a meaningful overview of all the opinions, which frequently only refer to very specific situations and experiences?

The procedure of clustering and summarizing text groups into *linguistic gestalten* is repeated until no further coherent thematic groups can be organized and built into *linguistic gestalten*. By the application of the same syntactic and semantic rules, thematic problem spheres ordered as *linguistic gestalten* are then synthesized into *hypergestalten*. These show

important relations and knots between relevant problem fields and problem-centered goal clusters. Finally, *hypergestalten* are collected into *higher order hypergestalten*, again by applying the same rules. Consequently, the results of the analysis of the verbal data are hierarchically structured in different levels the sum of which we call the *"gestalten-tree"*: Each text on a higher level is grounded on several texts of the next lower level. The texts on the highest level are thus the most general, expressing more relevant results. By navigating through the data, we can substantiate every result through to the original answers on the lowest level, i.e. the original answers. The structure of *gestalten-trees* is self-similar in a formal and in a semantic sense: formal self-similarity is given as all the syntactic rules hold on all levels of the gestalten-tree. Semantic self-similarity holds for the reason that all concepts and the meaning given on the highest level are used also within more complex details on the lower ones.

5. How are evaluations and value judgements of those questioned registered?

After all the answers have been analyzed and coded, the intrinsic *assessments*, *value judgements*, *opinions*, *wishes and points of criticism* are listed as *assessment profiles*. We thus obtain those topics which appear most important and urgent to those affected at the time of the interview.

6. Can we form a network of causal assumptions using the answers to our open questions?

As experience has shown, answers to open questions not only contain opinions, descriptions and value judgements but also utterances concerning causes and effects. Causal statements frequently provide condensed experiences of the work processes of those questioned. If we collect all the causal statements in the form of a diagram, we obtain a very complex *causal network*. It is used to evaluate possible effects and side effects of core variables.

#### 7. Which are the particularly important core variables?

If a topic or variable is found at the top of a gestalten-tree and if it is closely networked within the causal network and if the variable has a high position in the assessment profile, then this is a significant *core variable*. During problem solving attempts one will pay particular attention to these variables. All the core variables together are shown automatically in form of a *relevancy list*. They provide *governing principles* for the problem situation, which serve the integration of the various measures.

Core variables express *basic values and primary goals* of the questioned people. Depending on the type of question, these may also consist of other important *qualities* of the work process or the result (e.g. quality defects). In order to provide an overview of how interviewees understand basic values, primary goals, relevant means, et cetera, a synopsis of the groups of answers is generated explaining the core variables and their interconnection. If required the corresponding original texts can be retrieved in the data base and read.

Commonly defined and accepted basic values and primary goals form the basis of a cognitive Leitbild or vision of an organization. But a Leitbild needs to be formulated in a way that facilitates team spirit among colleagues as well as motivation for individual members of the organization. Motivating, appealing content cannot be found on higher levels of the *gestalten-tree*. Higher levels contain consensual cognitive and rational contents. Motivating emotional contents and symbols are located on the lowest level, i.e. the level of original answers. The task is to represent basic values and primary goals through original answers and statements of those affected. Therefore we look for adequate texts in the verbal data base that express emotionally laden metaphors, symbols, moods, opinions, visions or other elements representing specific basic values and primary goals. It is these emotionally laden texts and statements that motivate people. This is why they function as effective material for appealing visions of organizations.

#### 8. *How do we obtain goals and measures?*

It is not only problems, causal connections, wishes, basic values and aims that are mentioned in open questionnaires, but also intermediate goals and measures. These are arranged in such a way that their primary attribution to fundamental values and primary aims is expressed. Within the causal network we can select specific variables that are defined as goals. Then we choose variables influencing the selected goal directly or indirectly, depending whether they are means or intermediate goals. On the computer every variable, be it a goal or a mean, can be selected individually. So we construct a network of means, intermediate goals, primary goals and basic values for the respective social system. By navigating through the data, we can eliminate variables that are neither effected by nor influencing other variables. Due to the complexity of a causal network in bigger samples the elimination of isolated and scattered variables becomes inevitable. In this manner, we obtain a graphical overview for every single goal in the data illustrating applicable means to realize the respective goal or at least to influence it positively.

9. How can we estimate possible consequences and side effects of selected means?

As only a few of the measures suggested can be realized, some will have to be selected. Thus the many individual suggestions are weighted. A core programme can be developed. Means that contribute to the realization of several goals should be taken into closer consideration. But they could also have many negative side effects. Therefore, we select a specific mean on the computer and graphically represent all expected consequences and side effects assumed by the questioned people. We continue this procedure extending the *causal network* around the selected mean until no more consequences can be found in the data. After testing all means in this way, we decide for those means that promise mostly positive effects and the least negative side effects. Thus, realizable means are reduced to a reasonable degree.

#### 10. How do we represent the results?

Quality improvements within an institution are generally not to be obtained by one or a few measures implemented by the management of the institution. Rather, motivated cooperation of many individuals is required. In order to secure the cooperation of employees or those affected, it is advisable to include employees, representatives of the interest groups et cetera in the decision process. By means of holistic and comprehensive information of the interviewees a better understanding of the overall situation can be conveyed. This facilitates the inclusion of personal attitudes, aims and wishes into the context of a greater whole. Thus compromises tend to be more feasible when the partners in conflict can understand and appreciate the position of their counterparts. To convey the results to an audience, the program WinRelan can be used to present the gestalten-tree, the assessment profile and the table of relevance, as well as the graphics of the *causal network* interactively. This makes it possible to follow the interests of the present people and to respond to individual questions by presenting specific details from both the results and the data base.

Apart from being informed about the results, all those involved must be made to understand that many small changes in all organizational units, departments, teams, professions, can work together synergistically. It is of advantage for the various interest groups when different modes of action are possible – in so far standardization is not required by force of circumstance. The integration of various measures is achieved through common points of focus, such as basic values and aims, on which they are oriented.

## 11. How can we settle conflicts with the help of GABEK?

In cases where conflicting parties are not willing to negotiate, the following procedure has proved a success: every member of the involved parties is asked about his/her view of the issue. The results of every single party are then presented to that respective party. Usually, this leads to agreement among the members of one party and makes them curious about the arguments of the opposing party. This makes it easier to arrange a meeting with the conflicting parties at which the common grounds in the arguments of all parties are presented. This is a sensible preparation for the presentation of opposing positions which highlights the conflict from the different perspectives and makes intelligible distinct arguments.

If for whatever reason a direct meeting of the conflicting parties is impossible, GABEK offers the possibility to *simulate dialogues* between the opponents. The computer simulation with *WinRelan* is based on the *gestalten-trees* of the opposing parties and can be carried out by single members of one party or even by persons not involved in the conflict, i.e. the organizer of the GABEK-project. The simulation can demonstrate possible compromises and point out expected fields of confrontation. Conflict solving strategies and realistic processes of development as suggested by the involved parties can be emphasized. During the interactive presentation it is always possible to consult the material from the opposing parties by making proposals or raising objections.

By the mediation of conflicting positions with GABEK, it is made possible to derive reasonable solutions for all involved parties. The results of GABEK-analyses often suggest holding back rather than jumping to conclusions and taking ill-considered actions. Conversely, goals and means can be selected on the basis of the GABEK-analysis that are oriented at mutual interests and facilitate medium- and long-term success for all involved parties.

12. How can formal and informal communication facilitate the realization of means in the organization?

Feedback of the results to all members of an organization stimulates new discussions. However, this is not sufficient for a creative realization that is adapted to the specific situation. Consequently, we need to focus on the following:

Initially, connected aspects of the causal network of manageable size, i.e. basic values, goals and means, are chosen by or assigned to all departments, working units, teams and colleagues. Every department or team is responsible for the respective working processes related to the selected

aspect of the causal network. Then, formal patterns of cooperation between different departments, teams and colleagues of the organization are defined that grant recursive, cyclically organized processes of cooperation. The aim of these cyclically organized cooperation structures is the integration of different experiences with and opinions about ongoing processes of development by selected means and the coordination of actions.

In the implementation of measures not merely short term consequences but also long term effects on the community are to be considered. In unclear situations it is frequently better to wait and do nothing rather than to act prematurely. If one does not obtain a positive result to the three subsequent considerations one should rather abstain from putting the measures into practice. The activities of a community, of an institution, or another social unit should be compatible with the values and aims of the next greater social system in which the social unit is embedded. Every activity of the community is to be examined as to where it can have a negative effect on the basic values and aims of the community. Finally, the activity of every community should interfere as little as possible with the individual values and personal aims of the members.

Therefore we try to realize both the values of the community and the values of the individual employee in a well-balanced way. Thus we begin with an open interview of the employees or those affected. This draws those activities to our attention which enable the achievement of a certain harmony between communal interest and individual needs.



Figure 1: Systems of Knowledge (and their Relevance for Coordination of Actions in Social Systems)

# Summary

GABEK is a computer supported method for the transparent organization, processing and representation of knowledge. It is based on natural language

processing and is designed for applied knowledge management within systems of knowledge. With systems of knowledge we mean both systems of acquired knowledge through experience in social organizations and systems of conceptual knowledge as well as systems for searching and presentation of knowledge. GABEK combines theses different aspects of knowledge systems (see figure 1).

GABEK proceeds from open questions posed to members of a community to capture individual experiences within specific social situations (1). Explicit knowledge of social systems is primarily expressed in form of conversations and dialogues between members of a community. This knowledge is very flexible and it is grounded on social experiences and implicit procedural knowledge. Answers to open questions and recorded conversations build the verbal data base for an analysis with GABEK.

To process, organize and systematize the disordered knowledge of many individuals, GABEK provides several methodical steps (2 to 6). Each of these steps contributes to a holistic integration and connection of the complex distributed, multi-layered knowledge of members of organizations or social systems.

The results of a GABEK-analysis are conceptual knowledge systems, like "everyday theories", empirical generalizations, theoretical concepts, causal assumptions, values systems, et cetera, in form of *gestalten-trees*, *assessment profiles* and *causal network graphics*. Conceptual knowledge systems, condensed from individual experience of members of organizations or communities, are the context within which the actual situation of the respective social system becomes transparent and comprehensible. To regulate common actions within the social system, conceptual knowledge systems are still too complex and need to be filtered.

GABEK allows for the systematic selection of goals and means as described in the steps seven to nine. Expected consequences and possible side effects are analyzed individually, but with regard to the context of the whole system. This leads to the selection of realizable goals and means that regulate individual actions in the context of the given social system.

GABEK as a system for search and presentation of knowledge offers a function for the interactive presentation of results. This facilitates the realization of learning organizations or social systems. Complex results of the conceptual knowledge system are transformed into serial units of knowledge that can be represented both individually and interconnected in the network of data. Members of an organization or a community can interactively navigate through the results on the computer. The steps ten to twelve explain the existing techniques of presentation of results and simulation of dialogues with GABEK. These function as powerful stimuli of new conversations motivating members of organizations and communities to bring about improvements and changes by themselves.

Altogether, these twelve steps of analysis can be understood as a sort of meta-conversation between the members of an investigated organization or community. Regular feedback of the results to those affected stimulates further arguments and the parallel development of the social system. This is a theoretical form of social and organizational learning (see the lines with arrows in figure 1). Besides this theoretical learning, there exists practical learning which is based on experiences of individual actions and social interactions (see the dotted lines in figure 1). Attuned to each other, both forms of learning promote communicative processes within social systems. GABEK aims at the improvement of formal and informal conversations and mutual understanding. Consequently, it supports those values of a community which are grounded in mutual respect, confidence, interest and readiness to help each other. Promoting these values increases individual motivation for coordinated actions within a given social system which again increases the contentment of those affected.

## WinRelan - An Overview

The software package *WinRelan* (© Josef Zelger, Innsbruck) developed for GABEK-applications contains the following tools for the processing of data:



## Text Importing

After the transcription of the interviews, Word-Documents or text files are automatically imported into the index system of *WinRelan*.

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## Coding

Within the index system, the original texts are coded according to specific guidelines.



## Cluster Analysis

The cluster analysis organizes the texts in provisional text groups according to their conceptual content.



#### Gestalten-Tree

The text groups are processed into meaningful and consistent thematic problem fields and focal points. The results are organized in hierarchically structured levels of *linguistic gestalten* and *gestalten of higher orders*.



#### **Statistics**

To evaluate a project formally, reference numbers can be calculated. A statistical program to analyze data quantitatively is developed.



## Causal Networks

The interviewees' knowledge and statements about experienced *causal relations* are represented as a complex network of causes and effects.



## Assessment Profile

Assessments, value judgements and criticisms of the questioned people are represented in form of lists.



#### Relevancy Analysis

From the *gestalten-tree*, *causal network* and *assessment profile* the user can derive at strategically relevant *core variables* from the interviewees' points of view, serving as governing principles for the respective problem situation.



#### Understanding of Complex Situations

Navigating through the *gestalten-tree* serves as an interactive tool to follow the interviewees' argumentation. This facilitates a holistic perspective on the data and enhances the understanding of complex situations.



## Basic Values and Primary Goals

Significant core variables represent the *value system* of the questioned people or of an organization. Basic values and primary goals may be explored in their interconnection with proposed means.



#### Means

Usually, interviewees' propose realizable means to improve problem situations. Probable effects and side effects in relation to basic values and primary goals can be simulated.



## Decision Support in the Selection of Means

Groups of individuals, professional groups, departments and organizations determine focal problem fields and select priority means for the realization of specific goals.



#### Comparison of Results

To compare opinions pro and contra, dialogues between groups of individuals are simulated to facilitate the understanding of others in their own language and to resolve conflicts.

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