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Negative catalogues in decision goals: An instrument for the management of decision-making processes

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Nr. 109

Jürgen Hauschildt

Negative Catalogues in Decision Goals:

**An Instrument for the Management
of Decision-Making Processes**

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Allow me to begin my study on

"Negative Catalogues in Decision Goals:
An Instrument for the Management of Decision-Making Processes"

with a real-life event:

As stipulated in the university bylaws, the twelve-person committee of the Central Research Commission of the University of Saarland met in May of 1973. The single item on the agenda was the distribution of DM 400.000.00 in unspecified research funds. Eighty applicants were applying for a sum total of 3.2 million marks.

First of all, before making a decision, the members of the Committee wanted to ascertain their goals. A discussion began during which the following intentions were articulated:

- supporting all projects with the greatest scientific or academic significance
- dispersing as many funds as possible to particularly expensive scientific research
- dispersing as many funds as possible to particularly expensive medical research
- supporting the humanities and the sciences as evenly as possible
- supporting as many individual researchers as possible
- supporting the projects with the greatest political resonance
- supporting all projects which effect an improvement in university studies

- supporting the projects of researchers, who had previously been particularly successful
- supporting those projects which up to now have had no possibility of support elsewhere
- supporting projects in very early stages of research, in order to facilitate support later from other sources.

After a discussion lasting more than three hours the chairman summed up the rising uneasiness in the sentence:

"If we only knew what we don't want!"

Let us leave the meeting of the Research Commission for a moment and ask ourselves if this articulation was meaningful. Meaningful in order to make a selection.

1. THE PHENOMENON OF NEGATIVELY DEFINED GOALS

According to classical decision theory, goals describe desired future reality.¹⁾ So they also provide the criteria by which the possible alternatives are to be judged. It is the desire of the decision maker which positively determines the individual attributes of the alternatives, labels them desirable.

This perspective should be supplemented by its converse at this point: the decision maker indicates which he doesn't want to do. It is the negative wants of the decision maker which determine that certain attributes of the alternatives are to be avoided. These negative characteristics continue to remain a "general imperative".²⁾ the decision maker does not want to eliminate a single alternative by determining

¹⁾ Confer therefore the definitions by ENGELS (1962) P. 45, BIDLINGMAIER (1964) P. 28 p., ETZIONI (1964) P. 6, SCHMIDT-SUDHOFF (1967) P. 16, 113, HAMMANN (1968) P. 259, JOHNSEN (1968) P. 152, GROSS (1969) P. 284, KIRSCH (1969) P. 668, MAYNTZ (1969) C. 1256, HEINEN (1971) P. 45, 51, KAST and ROSENZWEIG (1974) P. 156.

his negative goals, but rather all alternatives which correspond to the negatively determined goals, that is, have attributes which are not desired.

Such negatively determined goals are certainly not foreign to the decision maker. A lot of classical decision problems contain goal elements, by which certain attributes of the possible alternatives are eliminated according to facts or according to degree:

- In purchasing decisions: the exclusion of certain quality levels, certain countries of origin, the prohibiting of going below a certain purchasesize,
- in financing decisions: the exclusion of certain financers, certain forms of financing, the in-acceptability of going over a certain maximum interest rate,
- in investment decisions: the prohibiting of extending beyond a certain period of return, the prohibiting of going below a minimum rate of internal interest,
- in personnel decisions: the exclusion of applicants who don't furnish a certain qualification or appropriate documents, the exclusion of certain salary levels, prohibitive form of bonus payments with the intension of not going below a certain minimum production level, etc.

How can decisions be made at all on the basis of negatively determined goals in economic situations? Doesn't the application of negatively determined goals fundamentally lead to not taking action? To this I first of all offer a superficial reply: Not taking action - contrary to practical observation, to be sure - can be a quite sensible form

of behavior. Besides positively determined goals don't necessarily lead to action. But we don't want to force the discussion into this sophisticated corner.

In reality positively and negatively determined goals usually go hand in hand. This case alone deserves our true interest. None the less, special cases can be constructed in which an explicit determining of a positive component in a goal system is not needed to coincide with the determination of a negative one: when, for example, the positively determined goal is fully complementary with the negatively determined one. The level of reality in such concepts appears difficult to assess. Let us rather proceed from the following concept:

Negatively determined goals are a component of a goal system in which more than one goal is included. Among these other components there is at least one positively determined goal.

Or expressed differently, the negatively determined goal does not exist isolated from this other, positively determined element. There must, however consist - at least partially - conflicting relationships between these two.³⁾

Please allow another definition: We speak of "negative catalogues" by which we want to say that not only one, but rather many goal attributes are negatively determined according to facts or according to degree. In the same way that we realistically proceed from multiple goals in connection with positively determined goals;⁴⁾ we must proceed likewise in connection with negatively determined ones. Relationships are also to be ascertained between the various goals; in the case in which several negatively determined goals compete with each other priorities must be set for the negative wants of the decision maker.

³⁾For goal conflicts see BIDLINGMAIER (1968) P. 47 pp. and HEINEN (1971) P. 140 pp.

⁴⁾For a summary of empirical findings see HAUSCHILDT (1975) P. 298 pp.

2. SOME STIMULI OF OTHER RESEARCH APPROACHES

I must deny myself the opportunity of reciting a thorough glance through the literature, which could be helpful in fully illustrating the observed phenomenon of negative catalogues. None the less the following pointers are given:

- In psychological literature references to negatively determined goals can be found under the key words achievement motivation, conflicts, level of aspiration.
- In economic literature such negative catalogues can be found under key words such as risk aversion, decision making under uncertainty, goal conflicts in portfolio decisions, constraints in decision-assessments.

Our further discussion refers to the following impulses of these theoretical concepts, but intentionally also makes some distinctions:

- (1) From the theory of achievement motivation⁵⁾ and from the concept risk aversion⁶⁾ we arrive at the reflection that acting economically takes place within the field of desirable and nondesirable conditions. Nevertheless we are interested in freeing the negative components from being regarded as inferior or as necessary evil.

They are to be given form, not merely to be accepted reluctantly!

⁵⁾ See ATKINSON (1957) P. 359 pp., HECKHAUSEN (1963), ATKINSON and FEATHER (1966), WEINER (1972), WEINER and MEYER (1975) and WEINER (1976) P. 81 pp.

⁶⁾ Confer therefore MARKOWITZ (1959) Concepts of Portfolio Selection and other rules of decision making under risk and uncertainty, such as the minimax-rule.

- (2) From the theory of level of aspiration⁷⁾ and the theoretical model-handling of constraints we take the idea of thinking in terms of limiting and threshold values when applying negative catalogues. Differences should also be pointed out here. The theory of level of aspiration and even more obviously the theory the aspiration-level are fascinated more strongly by the idea of the limiting value being surpassed than by the prohibition of values below the limit.

It is, however, just this aspect which we want to emphasize by means of reflections on negative catalogues. Now you may object that this is exactly the starting position for setting constraints in decision models. That is correct, however, that doesn't mean that negatively determined goals and constraints are identical. Highly different types of constraints must be distinguished from each other:⁸⁾

- Constraints which exclude unreal constellations, the non-negativity condition or the integer condition. They have no goal character.
- Also constraints, which are to be considered on account of externally imposed market and plant properties on account of restrictions or regulations, have no goal setting character.
- Also constraints, which express internally accepted, usually technically determined restrictions of production factors, don't permit themselves to be conceived of as goal elements because they lack the characteristic of being selectable and determinable.

⁷⁾ Confer therefore SAUERMANN and SELTEN (1962) P. 577 pp. who first applied this theory economic decisions.

⁸⁾ See also SCHEER (1969) P. 30 and HEINEN (1971) P. 51.

Only the constraints which postulate realizable and consciously fixed threshold values for taking action, thresholds below which values are unacceptable, permit themselves to be designated as goal elements. It is pointed out, for the clarification of terms, that in all cases this and only this type of constraints can be covered with the term "level of aspiration".

The theory usually anticipates "inflexible" constraints. This idea doesn't correspond with the notion of negative catalogues either. More likely, the theory of adaptation the level of aspiration appears to be reapplicable here which, when limiting values are persistently not met, also accepts their curtailment or otherwise: constraints are more likely conceived of as "flexible".

This is also our intention, I thus take up the following thoughts from the already mentioned starting points:

Negative catalogues bring out the meaning of self-set limiting values and should consciously stimulate a goal formation process when these limiting values are not met.

In this manner we consciously extend beyond the already mentioned starting points of the literature:

We want to stress that more attention should be paid to the negatively determined elements of the goal system.

They are to be made conscious and to be handled with deliberation. They are instruments for the management of decision-making processes. It would be incorrect to dismiss them as only annoying, bothersome or hindering, but unfortunately none the less unavoidable restrictions to the development of pure rationality.

3. THE FUNCTIONS OF NEGATIVE CATALOGUES IN DECISION MAKING

Just as the preceding explanations served to examine whether negative catalogues are to be expected at all and if so where, the following observation should now devote itself to the question, how the negative catalogues affect the progress of decision making. The observation can be divided in two parts: goals in decision-making processes have a selectionfunction, on the one hand, and a motivation function, on the other. I now want to examine whether and how negatively determined goals fill these functions.

If we proceed from the classical task constellation, the function of goals would be to choose the optimal alternative out of a "given" set of alternatives. Our question reads: How should one conceive of the selection function of negative catalogues in such a selection, in which - I repeat - numerous positive and negative goals compete with each other?

Goal theory knows two concepts for the order of relationships between competing goals:

- the utility concept and
- the constraint concept.

The concept of the multiple-goal dialogs, which attempts to combine the two concepts with each other, is not taken into consideration here.

According to the utility concept, competing goals are joined together in that ^{they} they are transformed into a goal attribute which is hierarchically higher, utility. Unlimited substitution among various goal variables is permitted. Exchange relationships therefore appear between

...

positively and negatively determined goals⁹⁾ Along with the resolution of the goal attribute utility, the character of the negative catalogue seems to be thus preserved. If and in as much as decisions are made according to a utility concept, it therefore appears at first glance that the concept of negative catalogues is nonessential.

Now striving for maximum utility is just one of the variants of the newly formed goal function. It is also conceivable that the striving is directed towards a minimum of utility, which in all cases is to be reached and in no case not to be attained. Examples for the application of the minimal-utility models, mostly in a linearly additive variant, are, for example,

- the credit-scoring models, by means of which decisions can be made on the extension of private credit in banks,
- in product tests, which only classify certain products as acceptable if a certain utility level (number of points) has been reached.

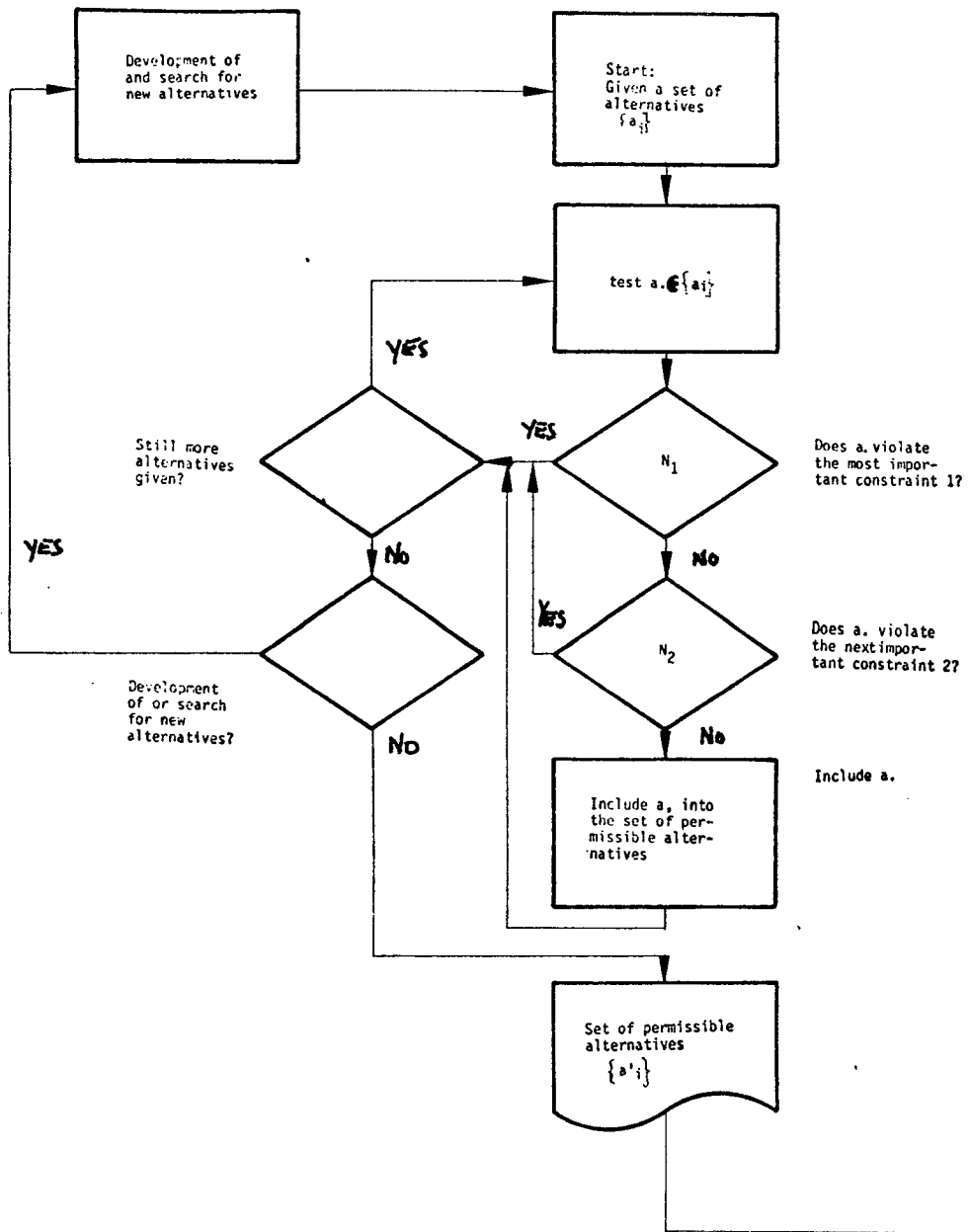
Upon closer observation, the utility concept thus definitely permits the application of negative catalogues, although only by way of the concept of a minimum of utility.

Let us now have a look at the negative catalogues in the constraints concept.

The constraints concept divides the decision into a sequence of partial decisions, each of which is tested to determine whether the alternatives correspond to the constraints before they are subjected to the test using the positively determined setting of goals. The decision-making process can be presented in the following manner:

⁹⁾For a discussion of these "compensatory" hypotheses see SLOVIC (1966) P. 427 pp., HOFFMAN (1968) P. 53 pp., and SLOVIC (1972) P. 784 pp.

EVALUATION PROCESS 1



EVALUATION PROCESS 2

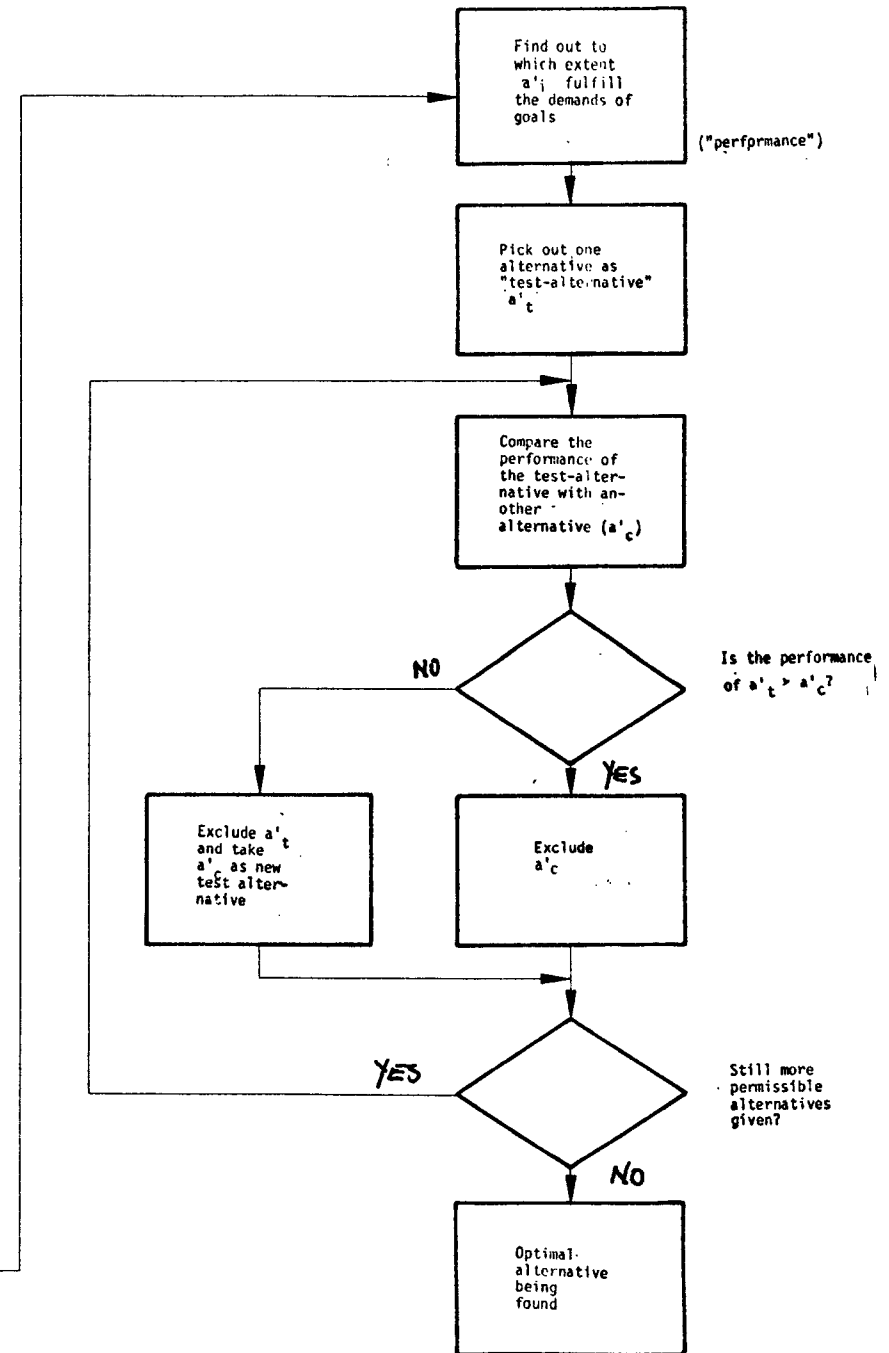


Figure 1

In this procedure the constraints act as filters which reduce the number of alternatives (evaluation process 1).

The reduction of this complexity depends on

- the number of constraints,
- their limiting values and
- the order in which they are applied.¹⁰⁾

How does one arrive at a solution to the decision-making problem?

The solution is given when the selection process only leaves a single alternative. You can see from Figure 1 that such a solution is not necessarily arrived at when only the catalogue of negatively determined goals is applied (shown in the fields N1 and N2).

This is not independent of the number of alternatives to be tested:

- If the number is small, then the probability is greater, that even the negative catalogue will lead to the determination of "the" solution, than when the number of alternatives is large.
- But, with a small number of alternatives the danger that absolutely no alternative passes through the filter of the negative catalogue any longer, is not to be assessed as minor.

We should remember: the larger the number of alternatives, the more effective the selection procedure of the negative catalogue, in as much as

¹⁰⁾ A thoroughly examination of the sequence of such filters is mentioned by BETTMAN (1971) P. 465 pp., WRIGHT (1974) P. 555 pp. and PAYNE (1976) P. 366 pp.

- the number of alternatives is reduced and
- at the same time numerous alternatives still remain for the positive selection.

Just the same, the decision-making problem would then be solvable in each case with the help of the negative catalogues, if a gradual variation in the limiting value would be permitted. The slackening and the tightening up of the limiting value places the decision maker in the position of being able to vary the entire structure of his negative catalogues long enough so that one alternative, "the" solution passes through the filters.

Looked at in this manner, the decision maker maneuvers between the barriers of the constraints. They play, in case of doubt, a more important role than the actual goal. Simon drew the organizational conclusion from this:

"If you allow me to determine the constraints, I don't care who selects the optimization criterion."¹¹⁾

It is therefore only consistent that we no longer differentiate strictly at all between the goal on the one hand and the constraints on the other, but apply them, along with Simon, as a complex goal, just as we attempt doing using the concept of negative catalogues.

An important prerequisite for the application of negative catalogues must finally be pointed out: as the diagram shows, the adherence to the conditions required by the negative catalogues is tested at the beginning of the decision-making process. They reduce the number of possible to the number of acceptable alternatives before the selection activities of the evaluation process 2. If we proceed from the concept of multiple negatively determined goals, then the question presents itself as to the optimal sequence in which the individual elements of the negative catalogue are to be ordered. This problem can't be thoroughly covered here, but reference can be made to several directions for solutions:

¹¹⁾SIMON (1964/65) P. 6.

- First, strict constraints have precedence over flexible ones.¹²⁾
- Then from an economic perspective, constraints with larger selection possibilities have precedence over those with smaller ones.

Now such suggestions concerning order are based on naive economic considerations which want to reduce time expenditures and other costs. For the management of political decision-making processes totally different criteria may however be relevant

- for example, the dominance of certain factual aspects or their representatives which is not explicitly explained,
- the early filtering out of solutions which lead to a dead end in the decision-making process or something similar.

In these cases the order of the individual elements of the negative catalogue must be determined separately in a meta-decision-making process.

4. NEGATIVE CATALOGUES AND MOTIVATION

It would be one-sided to view the goals of an organization merely as a measuring stick for the selection of alternatives. Beyond this, goals have a motivation function: they should stimulate and coordinate the initiative, creativity and achievement intensity of the individual taking action. These motivation functions organizational goals can only fulfill when they respond complementary to the personal goals pursued by those persons taking action. This com-

¹²⁾ Confer therefore the organization of investment decisions HAUSCHILDT (1970) P. 85, 89 pp.

plementarity is produced by the system of sanctions of the concern which by means of rewards sees to it that a fulfilling of the organizational goals also leads to the fulfilling of personal goals and vice versa: The system of sanctions penalizes the nonfulfilling of organizational goals.

The system of sanctions is based on the accomplishments of three bureaucratic mechanisms, which are interrelated:¹³⁾

- Through delegation of competence, a task is appointed to a decision maker by his superordinate for independent fulfillment.
- Responsibility imposes the duty upon the subordinate of personally accounting for the fulfillment of this task in accordance with the goals.
- The control checks if the task has been fulfilled in accordance with the goals. The allocation of the sanction depends on the results of this test.

The consistency between personal goals and organizational goals can only be guarantied if this multiple-phase conforming process is consciously developed and effectively handled.

Which role do negatively determined goals play in this conforming process? Do they more closely correspond to the demands of this process than positively determined goals? Does the dissatisfying performance of negatively defined goals lead to other sanctions and thus to a different management of decision-making processes than the striving towards positively determined goals?

Three reasons let us assume that negative catalogues have other effects than positively defined goals:

¹³⁾ See HAUSCHILDT (1969) C. 1693 pp. and the literature mentioned there.

1. The theory of achievement points out that the negatively determined motive for avoiding failure corresponds more closely to particular personality structures than the positively determined one for striving for success. If you supplement these views with economic and organizational views, the particular relevance of negative catalogues for the conforming process already described will become obvious: The conforming process requires precise, determined goals, in order to be able to hit upon clear-cut expressions of control which substantiate the acceptable and actually accepted sanctions.

Let us make these demands clear with an example:

Assume that the goal is "maximizing the turnover of product I in sales area A in month J".

The control result reads: Sold 150 units!

Was the goal fulfilled?

This question can't be answered; the decision maker can't justify his actions. Expressions of control and goal function are not compatible with each other, the result cannot be evaluated, a sanction cannot be measured because the goal function is determined without an upper limit. Only with the insertion of a negative component, say

"maximize ..., but attain no less than ...,"

would access to control be opened up at all and the basis would be laid for reward or punishment.

2. If certain goals are excluded according to the facts, or if a scale is determined which is no longer tolerable and if these goals are consciously, bindingly and openly fixed in the course of the delegation of competence and responsibility, then we have

a goal decision, which forces the decision makers

- towards conscious reflection,
- towards an exposed commitment, and
- towards an application of the same kind, which doesn't change.

The goals which are emphasized to such a way, are certain to receive greater attention than a vaguely and openly determined, positive goal.

3. If negative catalogues in the form of constraints are attached to a positively determined goal variable, then an asymmetrical dominance of the constraints over the goal variable would be determined. The violation of a constraint violates at the same time the postulated order of the goal hierarchy. You might expect that the order for goals corresponds to the order for sanctions. According to this the violation of a strict constraint would be more severely punished than not fulfilling a positively determined goal.

The three arguments

- better controllability
- greater consciousness
- higher order

for negatively determined goals support the assumption, that they are of greater importance for the motivation of the decision maker taking action than positively determined goals.

Business administration research has intensively applied itself in the last years to the question

which instruments are suitable for the management of decision-making processes.

We know, for instance,

- about the importance of promoters,
- about the influence of process-management,
- about the value of setting deadlines,
- about the consequence of documentation,
- about the usefulness of particular styles of leadership in particular situations,
- about the importance controlling the information.

My team and I have tried in the past to deepen the knowledge of the meaning of goal formation for the management of decision-making processes.¹⁴⁾ In doing so we also came upon the phenomenon of negatively determined goals during the course of our research work.¹⁵⁾ As we came upon negatively formulated goals while evaluating the goal articulations during the course of acquiring electronic data processing equipment, we tried to investigate the relationship between these variants of goal setting and other characteristics of the observed decision-making process. In doing so it was shown that

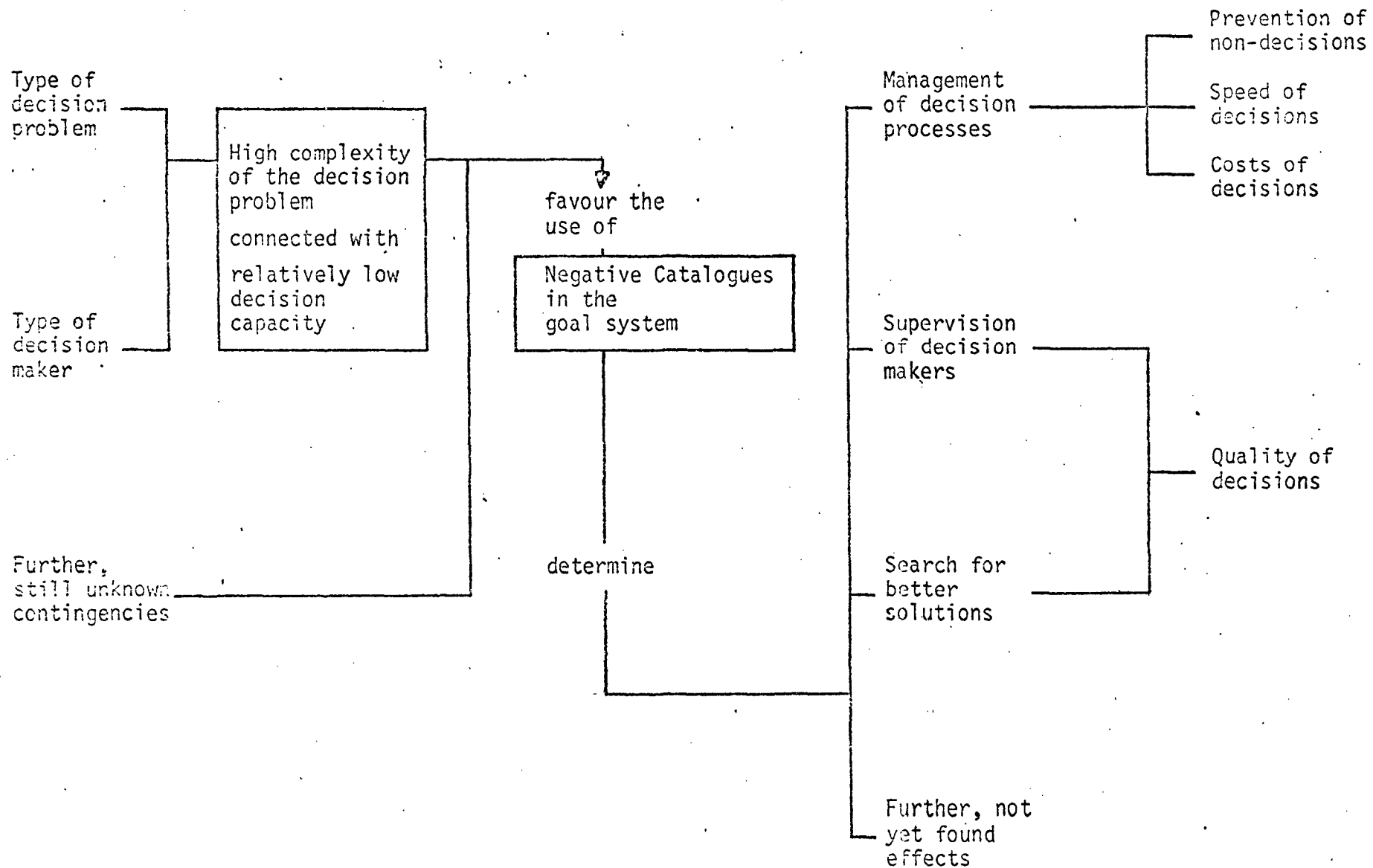
- negatively articulated goals appeared significantly more frequently in relatively short decision-making processes and ¹⁶⁾
- appeared more frequently in decisions which were ranked as "not-well-founded".¹⁷⁾

¹⁴⁾ Especially HAUSCHILDT (1970), HAMEL (1974) and HAUSCHILDT (1977).

¹⁵⁾ 25 % of 3,788 goal articulations were formulated negatively.

¹⁶⁾ 72 % (short processes) vs. 64 % (long processes).

¹⁷⁾ For the measurement procedure see GZUK (1975) P. 326 p.



None the less it was not shown that a relationship existed between the negatively determined goals and the quality of the decision (likewise judged in a rating scale). Should the negatively determined goals actually reduce the length and the thoroughness of the decision-making process, the result of the decision will not be affected by them - neither positively nor negatively. Evidently an instrument of the rationalizing of decision-making processes which appears to be applicable without loss of quality.

This is a heuristic impulse which arose unexpectedly and called for further investigation. The previously presented considerations show, to be sure, that there exists a plethora of theoretical criteria supporting the assumption that such negative catalogues can, in fact, raise the economy of the decision-making process.

The conscious application of negative catalogues in the management of decision-making processes promises positive results:

- hindering lack of decisions,
- speeding up decision-making processes and
- making the finding of solutions more economical.

The negative catalogues are therefore one of many instruments in the toolbox of the process managing authority.

The presented expectations for the efficiency of negative catalogues in decision-making goals are not limitlessly applicable. They must at least be modified from situation to situation

- according to the type of decision-making problem and
- according to the type of decision maker.

The shortness of time requires that these differentiations be omitted here.¹⁸⁾

¹⁸⁾HAUSCHILDT, J. (1978), P. 595-627.

Figure 2 shows a reference frame for further research activities.]
Whoever recommends a particular phenomenon of stronger scientific consideration, runs the risk of ~~it~~ being misunderstood that he thus at the same time objects to the other, the converse elements. In fact, it appears to us that thinking in negative catalogues is underdeveloped and incorrectly appraised. That, however, does not mean that we believe that all decisions whenever possible should be placed under the guiding principle of negative catalogues. Rather we plead for deliberated application of both variants of goals - positive and negative.

Positively determined goals and negative catalogues must be applied alternately. Nothing conclusive can be said here for the present about a particular

- sequence of application of positively determined goals with negative catalogues

or about the

- number and the manner of changes from positive goals to negative goals and vice versa.

At present we lack empirical knowledge. Still.

Let us return to the starting point of our observations, let us return to the meeting of the Research Commission. The members solved their problem quite elegantly. With negative catalogues. They decided that

- all projects of researchers without the postdoctoral degree "Habilitation" would not be acceptable,
- all projects of researchers who are not permanent employees of the university, would not be acceptable,

- all projects which lead to a purchase of equipment which cannot also be used by others, would not be acceptable,
- all projects which lead to a follow-up application, would not be acceptable,
- all projects are not acceptable in as much as they applied for travel funds.

After passing this negative catalogue the sum of funds applied for had shrunk to DM 800.000.00. About 30 projects remained. They then turned to the task of making a decision using a positively determined goal.

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