Expertise, Innovation and Influence

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This article focuses on the influence of expert knowledge and the ideology of specialized professionals on processes of social and political change. We shall first present a few tentative formulations towards a theoretical perspective on the role of expertise in political decision-making and will then pass on to a presentation of data from a case study. An attempt will be made to place this case within a broader theoretical framework and to draw a few tentative conclusions.

Developments within organization theory and related fields in the post-war period has brought considerable change in what once was considered as fundamental knowledge of organizational behavior. Research focused on human beings as quasi rational actors has particularly brought organization theory in as an important tool for political analysis. The role of the public administration in the decision making processes is no longer "understood" by reference to normative theory, but is being explored by new theoretical tools and empirical analysis. In this analysis a set of assumptions can be made, some of the most relevant to this discussion will be mentioned here.

Human beings have important limitations with reference to their ability to attend to, store, and process information.

Decisions are made within simple models of a complex "reality,,.

Long range socialization and adaption to information create cognitive patterns and identifications.

Organizations are an important environment for decision makers, and change in this environment can cause changes in programs or decision making models.

Changes are, however, due to the cognitive limitations of rationality, relatively exceptional in established organizations.

Decision-making processes are viewed as a set of cognitive processes taking place in a system of communication and other social relations ,and the processes by which information is sought, delivered, accepted or rejected and interpreted, i.e., organizational processes become crucial in understanding the outcome of the decision-making.

This perspective, in which organizations are analyzed as information processing systems and, in which the distribution of information is the basic independent variable, deviates dramatically from the classical interpretation of organizations as a

system of formal authority relationships. It is becoming evident, however, that the idea of congruence between the distribution of formal authority on one side and information and influence on the other, can not be retained.[1]

The interest in the information variable leads one to identify and analyze some of the main sources of information in the decision-making systems: i.e. the experts. "Expert„ is here used as a person commanding certain complex cognitive processes while being in the position of obtaining social acceptance of his knowledge in given situations.

By focusing on cognitive processes I do not intend to portray the expert as a calculating machine indifferent to values and without social affections. On the contrary, expertise is only meaningful in a social or even political context: Experts are trained to realize *some* values, to see *some* problems and omit others (trained incapacity); they solve problems for some groups, not for the whole society, although there may be cases where the clientele is so hard to specify, that the claim of serving 'the community' may be somewhat justified.[2]

Experts are not raised in a social vacum, their education is not indifferent to values; the instruments, concepts and processes which are their tools are geared not towards all kinds of problems for everyone, but more specifically, problem-solving for the benifit of *somebody,* and finally, most of the decisions are made in organizational contexts where some kinds of values and belief systems are communicated and used as premises for decisions. An organization is no more a neutral instrument than is an expert. The analytic distinction between fact and value should not blur the role of values even in the most advanced scientific enterprises, the systematic empirical coincidences of matters of fact and values should be explored intensively.[3]

A description of expertise must – to be relevant to political science – be a description of ideologies, the values of the expert groups and their social identifications, as well as their factual belief systems. Their role behavior and social background should also be given particular attention, and be described in categories meaningful for explaining the creation, maintenance, and diffusion of their ideologies.

The myth of the neutrality of experts has been surprisingly vital; it is typical that expertise is presented as the substitute for ideology in a well known political prophecy, without asking what problems the experts can solve, and for whom. One reason why the myth has been retained, may be that dominant experts of the time represent values and orientations the ruling élites subscribe to, and their values and problems can, without much opposition, be claimed to be universal. Even so-called critical social analysis is usually undertaken by the dominant socioeconomic groups (USA: "The white sociologist„) and based on their ideology. The central values are then refrained from the analysis, they are taken as natural phenomena.[4] This makes an understanding of some basic ideological traits of a society difficult or impossible.

One of the limitations of expertise as a "free floating resource" is integrated in social structures. The experts have traditionally had an inclination to perform "staff" functions in organizations. The role of the expert in organizations, however, and the characteristics of "expert organizations", have only recently been explored, and I shall only assume that experts play a major role in organized problem-solving. Beside

the integration in the hierarchies of a society the experts frequently organize horizontally, a major characteristic of a profession. A profession can be defined as a group of experts with some common high level training and an internal system of norms and sanctions. This means of course a stabilization of the role of the expertise in relation to the status system of the society, to other experts, and in their relation to the clients. Representing perhaps the most prestigous values of a society, and having the monopoly on certain kinds of problem solving, the professionals constitute the core of two types of organizations, the quasi-hierarchical formed organization (hospital, architect firms) and the professional association. These organizations, mutually supporting each other, exhibit the power of the professional expertise and the study of professionalization and of existing professions could be one important road in explaining public policies.

If we take their ideologies more or less for granted, the use of expertise, and how it is distributed by organizational processes, could be one way of explaining public policies. An alternative or supplementary method would ask questions about professional ideologies, and their implications and effects when used. Furthermore, the perceptions of the expertise on behalf of non-experts and the extent to which the predictability of realizing concensus values assumed in modern administrative theory – is as much a fiction as the neutrality myth.

Another perspective might be the role of experts in changing institutions and belief systems, and their role in initiating and implementing *new* programs.[5]

This function, to decide what shall be important and "true" in the years to come, is – despite some lack of attention in political and administrative research – probably equally important with the maintenance of "going concerns".

To the extent research has devoted attention to the theme of innovation there seems to be agreement that the existence of experts and to some degree non-hierarchy in organizations is crucial in explaining change.[6]

Herbert Simon postulates flatly that the most important role of the profession is that of the initiator of change. I tend to agree.

From this general discussion I shall now turn to a presentation of some data from a case study initially aimed at the exploration of conditions for innovation in an administrative agency – where the question of the expert roles turned out to be the most interesting part of the study.

"The Story" in Brief

In the summer of 1960 the City Planning Authorities in Oslo started a project known as the Transportation Analysis for the Oslo area. The project then aimed at the development of a device for the analysis of the city's transportation problems, and one wanted to use this device to design "realistic plans" for the long range development of a transportation system. (Roads and collective means of transportation.) The City Planning Office, Division for Master Planning,[7] was the official

sponsor of the project. Much of the work was assigned to a team of experts. Several auxiliary units were engaged, among others foreign and Norwegian experts. In 1964/65 the work was temporarily concluded, and after the analysis and the recommendations had passed through the appropriate city administrative departments, the City Council decided to accept parts of it. In fact, the Transportation Analysis turned out to be an analysis of several interrelated aspects of the growth of the city, one of which was of course the transportation system. However, the land use and location of city functions was taken as a variable and the final recommendation resembled more a long range master plan than an adaption of a transportation system to a given situation. It was the land use aspect of the analysis that was, in principle, accepted by the City Council, the recommendations for the transportation system, including a super highway through the city, were not then decided upon. The analysis was built on empirical research of transportation behavior in the area, a mathematical model was generated and several hypothetical alternatives were simulated and evaluated.

This Study

The study of this case has been conducted as an exploratory exercise and the impressionistic character of the data collection and, of course, the singularity of one case, invalidate any claim of having provided a basis for generalization. Beyond the possible heuristic function of the study, however, the close connection to familiar perspectives and concepts make the study somewhat more than an isolated case.

Thirty persons in some capacity or another related to the Transportation Analysis have been interviewed, some intensively. (The longest interviews lasted six hours.) Available written material, as well as some internal documents, have been examined.

The focus of the study has been on the ideologies or models held by the administrative agency and its environment, and how these ideologies were processed in the decision-making system described as a set of communication channels and other social relations, and finally the outcome or the policy is described. The situation studied was one of change, the agency directed its attention to a new set of problems, designed new alternatives, and attempted to obtain acceptance of its recommendations. Somewhat reformulated: the implicit dependent variable is the policy outcome (not the effects of these policies) the independent variable the decision making processes. Influence can be defined as the ability to change the models that serve as premises for decisions. The hypothesis is that ideologies and perceptions generate social relationships, and on the other hand change in social relationships generates change in the decision models. The persons engaged in full time activities in the Transportation Analysis project are considered members of the focal system. The system is viewed as open and relevant interaction processes across its boundaries are studied.

The social relations or traits of the decision-making processes are described by:

- Distribution of initiative.
  Who takes initiative to identify and formulate problems, to seek information and to deliver decision premises?
- Communication.
  "The processes whereby decisional premises are transmitted from one member of an organization to another."[8]
- Distribution of responsibility.
  Who perceive themselves as liable to criticism and toward whom is criticism directed?
- Distribution of authority.
  "Authority is exercised over an individual whenever that individual relaxing his own critical faculties permits the communicated decision of another person to guide his own choice."[9]
- Distribution of information.
  Who has structured information of possible relevance for the question in focus?

The substance – the ideologies, models or decisions are described by:

- Values.
  "Criteria that are applied to determine which courses of action are preferred among those considered."[10]
- "Beliefs, perceptions and expectations as to the consequences that will follow from one course of action or another."[11]
- Identifications.
  "A person identifies himself with a group when, in making a decision, he evaluates the several alternatives of choice in terms of the consequences for the specific group."[12]

The Environment of the New Program

The Transportation Analysis was in Simon's terms a general program for the solution of future transportation problems seen in relation to other planning problems. An important part of this program was built on a highly specific program for the analysis of transportation problems. The introduction of this program activated a new perspective and a new technique which in turn generated change in other parts of the hierarchy of programs used in city planning, since the master plan was the most general substantive program.

Programs are not given, but must somehow be found or invented, and action is initiated only under special circumstances, the most important of which is dissatisfaction with existing – previously satisfactory – programs. The first step in the study is therefore to identify factors causing the planners to direct attention to the particular problems of transportation and their perceptions of the existing program as unsatisfactory.

In 1960 a new master plan was being designed: it hardly represented any innovation, but tried to catch up with events which had taken place since the previous plan had been made. The dimensions of that plan, however, were rather traditional, it did not take in new elements from the world of phenomena potentially relevant to planning. The number of problems could be perceived as infinite; air and water pollution, urban renewal, lack of cities for housing, space for new activities, inconveient location of functional entities in relation to each other, traffic safety, traffic

congestion, etc. One of the most visible changes was the growth in the number of motor vehicles in the area from 1948 to 1959; there was an increase from 30,000 to 73,000.

The higher echelons in the planning administration were not particularly automobile oriented at this stage, and it was stated that the situation was not difficult compared to other cities. The fact that the traffic problem and particularly the automobile traffic problem did appear on the agenda can be explained by the following. The environment was very active in pin-pointing the problems, the mass media were preoccupied with traffic, 13 out of 43 interpellations in the City Council in 1960 were concerned with traffic, etc. In the City Planning Office some measurement of the traffic flow was being studied, and there were experts oriented towards these problems.

An interpellation from a very influential politician about the state of knowledge of the planners of these problems led the Commissioner of Transportation to contact experts in his administration to discuss the possibility of refining the instruments for the analysis of traffic problems. Some investigations encouraged the Commissioner to conclude that an analysis was feasible, and some doubt as to the value of the project from the City Planning Office was set aside by the combined efforts of the experts and the Commissioner.

Organizational Changes And Innovation

The expert team who from now on took the lead in the work was eager to introduce new perspectives and methods in the planning. Professional contacts with the conductors of a somewhat similar project in Stockholm structured their aspirations, they came to perceive their goals at attainable and high enough to be worth while. This "optium stress" situation along with the fact that others perceived the situation as critical, made the project feasible for organizational action.

The expert team consisted of one architect, one traffic engineer, and one sociologist with a substantial professional background in economic geography. All were highly regarded by their colleagues and superiors, but their rank in the hierarchy gave them no particular high formal status. Having partly defined the problems so that the three themselves, and possibly a few others, could have handled them, the small informal expert group gradually won official approval as a more or less independent unit. The Planning Office was not ready to hand the project over to the three; The Planning Office meant that it should be retained within the hierarchy for the sake of control and participation; it was felt that this was one of the most challenging assignments the organization had had. The experts felt that the freedom to use resources and freedom from a routine environment was necessary. After some time this was obtained, through support from the Traffic Commissioner. The project got its own budget, gradually more freedom to use economic resources, freedom to hire needed help and even geographical removal from the mother organization.

The internal relationships in the new unit were congenial and equalitarian. Teamwork rather than any form of authoritarian leadership prevailed, and though the work demanded integration of three different professional approaches, cooperation rather than conflict was predominant. This structure was retained also after the group was supplemented by other members.

The group members were very devoted to their work and felt it as very important. They felt it as their social responsibility to educate the administration and the politicians as to what kind of problems actually faced the city in the future.

The organizational unit was an open system, its transactions with its environment were vigorous. These transactions can be described by the actual relationships of authority, responsibility, etc., and, also the exchange of personnel. (The most important units in the environment are listed in the tables.)

The main directions of contact were with the administration of which the unit was a part, and to other experts. Generally these contacts were initiated and managed by the team itself. The experts consulted or recruited were picked by the team according to professional criteria and given assignments by the team. The operation analysts engaged were exceptions to the rule; the first tentative contacts with them resulted in initiatives and independent contributions on their part. Because of their heavy professional insights they managed to bring in new perspectives and introduce a new aspect of the problems. The general pattern of both internal and external communication was not structured by any formal chart, it was problem oriented, a reflex of perceived problems and problem-solving situations.

Once having established their somewhat independent status, the group did not want to be unrelated to the rest of the administration, but their superiors did not try to influence their work substantially after the problems were defined. The other departments of the city administration did not participate in the work. There were certain instances when cooperation was sought and no positive answer was given. The financial and technical departments were reluctant to commit themselves to the implications of the project.

Least vital was the relationship to the politicians. The contacts were indirect, infrequent, and intermittent, this in spite of the fact that the team wanted to discuss certain problems; they badly felt the need for some constraints indicating politically feasible or desirable alternatives.

Almost no action was taken unless the team asked for it (budgets). A set of reports, mainly technical in nature, were distributed as the work progressed, but these received very little response. In short, it seems as though the team worked fairly independently, but also unsupported from the political power centres of the city.

The picture of the team, as an equalitarian but highly skilled and dedicated set of persons highly externally oriented, and taking most of the initiative themselves, is valid for two phases in the process; initiation and design. In the last part of the design phase, leading over into the evaluation and choice phase, the experts changed their roles. When in the design phase the main problems were identified and in fact solved; the integration of this product into a more comprehensive proposal more like a master plan was undertaken by the City Planning Administration and the expert

team jointly. Most of the conclusions were drawn from the premises given by the analysis, some were arrived at independently of this.

In the third part of the process the Traffic Commissioner and the other hierarchical leaders took over in "selling" the proposal. The team was dissolved as such after the job was done, but the members did not go back to their positions in the administration. They had by their work gained a professional status that demanded a new environment, and they were engaged in a research institute, taking as one of their assignments the consideration of possible changes in their newly completed work.

The following three Tables give a summary of the patterns of relationships in the three phases.[13]

Table I. Characteristics of Social Processes in Initiation Phase (I)

Social unit	Initiative	Responsibility	Information	Authority	Commun.
Expert team	H	M	H	M	H
The Comm. of Exp.	–	–	–	–	–
Other Experts	M	L	M–H	M	H
City Planning Adm.	M–H	M–H	M	H	H
Residual Adm.	L	–	–	–	L
Architects Assc.	M	M	M–L	M–L	M
City Council	M	M	L	M	L
Committees C. C.	L	–	–	–	–
Interested public	L	–	–	–	L
Business	M	–	–	–	L

H: Relatively high
M: Mean
L: Relatively low
–: Data not available or not applicable

Table II. Characteristics of Social Processes in Design Phase (II)

Social Unit	Initiative	Responsibility	Information	Authority	Commun.
Expert team	H	H	H	H	H
The Comm. of Exp.	L	M	M	M	L
Other Experts	M	M	M	M	H
City Planning Adm.	M	H	M	M	H
Residual Adm.	L	L	L	M	L
Architects Assc.	L	M	M–L	M–L	M–L
City Council	L	M	L	M	L
Committees C. C.	L	L	L	L	L
Interested public	L	L	L	L	L
Business	L	–	M	–	L

The preceding Tables highlight the high involvement of the experts, particularly in the initiation and design phases. Some questions of their authority took place in the initiation phase. Near the other extreme we find the politicians' low involvement, only in the last phase can some increase in activity be seen mainly confined to the committees of the City Council. It is also in the last phase that the technical and financial administrations become involved.

Table III. Characteristics of Social Processes in Evaluation-Choice Phase (III)

	Initiative	Responsibility	Information	Authority	Commun.
Expert team	L	H	H	H	L
The Comm. of Exp.	–	–	–	–	–
Other Experts	–	–	–	–	–
City Planning Adm.	H	H	M	H	H
Residual Adm.	L–M	L	L	M	M
Architects Assc.	L	M	M	M	L–M
City Council	L	M–H	L	–	L
Committees C. C.	H	H	M–L	H	M
Interested public	L	–	–	–	L
Business	–	–	–	–	–

Substance: Ideologies, Attitudes

In the morass of beliefs and perceptions as to what the city problems "really" were like, one can trace a set of more or less consistent models or ideologies. Together with more fragmental and incomplete opinions of political relevance for a city plan, these ideologies or models constitute the "raw material" of the process previously described. In my research I found the following ideologies and opinions – to be described here in a simplified manner – were held by groups close to the decision-making system, and thus having the theoretical potential to obtain access. The content of the recommendations, and, to the extent they exist, the content of the final decisions, will also be described.

"The Architect Ideology"

Being a dominant profession in city planning, the architects of the city of course had their models, opinions, and professional attitudes concerning city development. The core element in their world is the land and its use as sites for physical structures performing certain functions and realizing the values of the profession. The business housing and recreation functions seem to be more central than, for instance, the traffic function. The relationship between elements is assumed not to have been arrived at by systematic analysis. A city sculpture approach seems to prevail over an analytical approach, that is, beauty and consistency are equally as important as functional features. The softness of the approach is accentuated by the stress on such values as milieu standard including aesthetic values and access to cultural and social events. A low level of noise and pollution is also an ideal. The architects seem to perceive themselves as the humanists in planning among the "hard" professions, with a more over-all perspective than others. They leave large room for imagination and are not willing to take too many factors for granted. They are particularly

reluctant to consider economic and technical problems as constraints. The architects have diffuse identifications, perhaps the well-to-do middle class is of main concern to them.

The Ideology of the Traffic Engineer

The expertise held by traffic engineers seems most obviously to be highly relevant to the problems of integrated city planning, and in fact, traffic engineers played a major role in the process described.

The traffic machine, its functioning, its technical and economic qualities, and its environment are important elements in this model. In the analysis of factors generating traffic and the functional capabilities of the traffic systems, relationships are stated specifically and technical and economic opportunities and constraints, as well as to some extent the effects upon the physical environment, are taken into consideration. This type of expertise originated in the USA and perhaps as a consequence of this, land use is taken somewhat for granted: more so than should be the case in other places. The dominant value is quick, cheap and safe movement of automobiles. The traffic engineer naturally identifies with the motorists and takes the increase in use of automobiles for granted. The vulgar edition of this ideology – materialized in some U.S. cities – neglects aesthetic values and overlooks a wide spectrum of social consequences. Being a fairly new profession, the professional considers himself a mediator between the architects and the "old" road engineers.

The Business Ideology

A model of the planning ideology of business might be somewhat like this: The good city design should provide the physical opportunities for business to operate and expand, that is to let "real life" define its natural needs. The transportation system should be designed to facilitate efficient distribution of goods and ready access for customers to business areas, mainly inner city. The automobile has taken a dominant place in the picture and has come to stay, the owners of this device have as a part of their personal liberties the right to use it without any unnecessary restrictions. Parking problems can be solved by the construction of parking areas, etc. in the inner city.

The ideology is clearly limited in perspective, individual freedom is associated with free enterprise and opportunities to use the automobile, even at high social costs. Another value is efficiency in terms of economic profit. The holder of the ideology clearly identifies himself with the business community.

The Populist Ideology

This is held by the radical socialist and other radicals and is mainly concerned with what is conceived as the needs of the community and "the common man". The current development is conceived of as dehumanizing. Work, dwelling, the consumption of cultural and social goods should be facilitated by the city structure. Support for the demands of the automobile and the free growth of business enterprises in the city work in the opposite direction. Present and future traffic problems can be solved mainly by enhancing the development of public means of transportation, a subway system, local trains, buses, etc. The resources of the city must be directed towards these goals, and the current trend in inner city business expansion must be curtailed. The values are democratic control and equality. The holder of the ideology identifies himself with the common man, perhaps the ones who have no automobile and few privileges. Few factors are taken for granted, and the "development" is not accepted as "natural".

The City Council Ideology

This is an ideology with little consistency, but considered important because of its frequent use in decision making.

Problems of housing, lack of space and traffic congestion are considered. No definite relationships are perceived or agreed on, problems are solved as they arise, relatively isolated and with a short term perspective, even in cases where clear long range policies are pursued by the administration, a lot of exceptions are made. The traffic problems in the inner city are perceived of as a matter of broader streets and restrictions are considered unfair and unpopular. Very much is taken for granted and hence there is a little consciousness of alternatives and long range policies. The identifications are of course criss-crossed, but business and industry are important clients as they represent the main source of public and private income.

The Administration Ideology

This is an ideology of short term technical economic rationality. The rationality of the daily concrete work is more valuable than making "speculations". Much is taken for granted; for instance that the tracks of the subway system, etc. should be the main parameters when deciding the location of housing areas. Service institutions are not given an important place in the picture nor are aesthetic values. The holders of this ideology perceive of themselves as rational and neutral and identify themselves with the administrative institutions.

None of these ideologies can be identified in pure form in the document resulting from the Transportation Analysis. The project itself had as an aim to create a new model and, as this goal was attained, this caused some change in argumentation in other models.

The architect of the expert team represented a modified architect ideology; he was eager to supplement his professional models and gained an appreciation of a more analytical approach. The traffic engineer of the team also felt he was in a learning process and was quite ready to accept complementary perspectives to his own. The geographer-sociologist was the one most concerned with general planning ideology and had perhaps the most comprehensive views on the problems. The experts obtained agreement amongst themselves as to what objectives they should pursue, though they emphasized different aspects. They were all quite conscious of the most obvious limitations of their work and warned against drawing too broad conclusions from the analysis.

The perceptions of goals and problems changed as the analysis progressed from the first indications of a problem field through the first phase of the work. While the public was eager to obtain instant relief from traffic problems and the ability to handle them in the future, the experts saw the case as both a professional challenge and an opportunity to restructure perceptions of planning problems, knowing quite well that an isolated study of the transportation system would not produce any solutions.

The label Transportation Analysis was a matter of public relations more than anything else, necessary in order to gain support for the project. The outcome of the analysis was as mentioned above, a Master Plan in a thirty year perspective, spelling out the relationships between land use and the transportation system. The recommendations were reached on the basis of an elaborate mathematical model in turn based on research on transportation behavior. Several combinations were simulated and evaluated, but the planning administration decided upon one definite recommendation. The City Council was invited to curtail the growth of business activity in the inner city (limit the number of jobs) and aim at balancing living areas with business. The corresponding traffic flows were proposed taken care of by a system of subways and a set of new roads, including a super highway through the city. All this was based on a hypothetical situation in 1990.

By this recommendation and the somewhat dull debate following the release of the proposal one can trace the pattern of the new planning ideology.

> There was a change from the traditional architect approach towards analytical methods, including quantification of planning elements.
> A new consciousness of the long term implications of public policies today and the need for planning far beyond the current budget periods.
> Realization of the interdependence of problems.
> Realization that land use can or should be controlled and manipulated.
> The main focus on the problem of transportation. The problems of the growing number of automobiles in the future and the huge resources needed if these problems were to be solved, and the prospect of "chaos" if nothing was done.
> The necessity of a collective transportation system in *addition* to automobiles.

> A certain "scientific determinism" where marginal goals are perceived as not attainable under "the great scientific plan" in accordance with "the development".
> The struggle for resources will be more and more dramatic and more principal choices will have to be made.

There were no proper estimates of the direct outlay costs of the implementation of the recommendation and no integration of the proposal into budgets was undertaken. In a broader perspective, the multiplicity of consequences of the plan for other sectors, for other people than the motorists can only be guessed at.

In the first round of decisions in the City Council the plan was not accepted except for the part calling for balanced growth in the inner city. The transportation system related to this city development alternative was too dramatic to be accepted at the time.[14] So far the decision was a triumph for the planners calling for "planning", not only passive registration, and also perhaps for the "public interest" as opposed to particular interests, for instance business.

Some Tentative Propositions

On the basis of data from the study some suggestions as to the relationship between variables can be made.

The distribution of initiative in the initiation and design phases reflects whose definition of problems, beliefs and ideas are accepted. Lack of initiative from, for instance, the politicians coincide with lack of active influence on the agenda of problems for analysis and designs for courses of action. Particularly in the two first phases of the process the pattern of initiative reflects the patterns of information distribution.

The flow of communication within the expert group and the numerous and extensive external contacts reflects the comprehensiveness of problem perception and also the initial, somewhat unstructured, view of the problems. The limitations of the communication structure are equally important, the failure to establish effective contacts with politicians and the important technical and financial administrative branches reflects the lack of certain considerations in the analysis.

The new communication structure reflects the rejection of standard substantive programs.

The distribution of authority is closely related to the distribution of information, amount and complexity.

Finally I will present som propositions which extend beyond the model used in this analysis, but supported by the impressionistic data.[15]

The probability of innovation increases with an increasing degree of external orientation in an organization.

The probability of innovation increases when communication is not structured by traditional and stabile patterns.

The existence of professionals or experts increases the organization's exposure to

new problems and ideas. Experts are important sources of cultural diffusion in decision making systems.

In this case the expert team generated and conducted the external relations to a very high degree and other experts seemed to be the most important contacts. The expert team was also the broker for new ideas vis-à-vis the top of the hierarchy.

An organization having professionals as members is more exposed to criticism than other organizations, and is accordingly inclined to alter its level of satisfaction toward current professional standards.

The profession of architects was a constant source of criticism for the City Planning Office, an employer of architects.

The probability of innovation increases with the recruitment of young experts and members of new expert groups.

The experts operating in the team here were relatively young in terms of age and in terms of experience. The traffic engineer and the sociologist and geographer represented new sorts of expertice in the Planning Office.

The probability of successful problem-solving – design – increases as traditional hierarchial communication is dismissed and expertice replaces hierarchially based authority.

Data here show a cross divisional communication between the experts and direct contact between these and the department head. The integration of the experts into the normal hierarchy was perceived of by themselves as an obstacle to creativity.

Innovation is conditioned by the allocation of uncommitted resources to problem-solving and low degree of restrictions on its use.

Creativity is curtailed by a routinized environment.

Opportunities for being released from routine tasks increases with the level of education and membership of a profession.

Expert status or professional standing provide a psychological security that makes it unnecessary to rely upon hierarchial success and hierarchial status. The high degree of cultural diffusion within professions create alternative perceptions of problems and more general perspectives.

Attempts at innovation demand a particular base of legitimacy which can be privided by a recognized expert status.

In this case the innovators based the legitimacy of their project on the status of their own and others' expertice. A committee of experts was established to "control" the group. The committee was not very active but it reassured the department head of the legitimacy of the project.

Attempts at innovation are facilitated when they are not perceived as a threat to the values of existing élites.

The computer planning and the theories introduced here were bitterly criticized by the architects and only reluctantly accepted by the architects of the Planning Office. Other parts of the administration felt that the new techniques were a threat to their approach based on their expertise and common sense.

Acceptance of an innovation is facilitated when it is presented in a prestigious language.

The quantification and the mathematical analysis and computer processing were perceived of both as something beyond the comprehension of most politicians and administrators and as a feature of progress.

The borrowing of new ideas is frequently more important in innovation than genuine problem solving. Recruitment of new members to an organization is an important mechanism for this borrowing.

(The substance of innovations is most influenced by persons who initiate the change actively by their ability to redifine a situation and to structure the problem-solving process.)

A glance at the final recommendations compared with the ideologies of the experts affirms this in the present case.

Radical reformulation of problems and changes in focus of attention are not probable in the phases where new programs are presented and evaluated.

The political entities were in this case unable to question the relevance of the basic assumption of the analysis when it was presented.

To the extent that innovation occurs through borrowing, the content of the innovation will be a function of the communication structure of the organization. The communication between experts is the most important part of this structure.

Difficulties in communication, due to technical language, tend to lower the influence on the content of innovation of the non-expert environment of an organization.

New program ideas are filtered in the decision-making system. The outcome of this filtering is a function of the type of expertise represented in the filter. The filtering is a control, not a creative process and early filtering opportunities are decisive for the control of the content of the innovation.

Much of the controversy over the Transportation Analysis after its presentation was due to the fact that its economic and political feasibility was not determined by early filtering.

The politicians' need for diffuse and non-consistent program models lower their ability to deliver sets of constraints and goals in an experimental situation.

NOTES

[1] This is of course one of the basic weaknesses of Max Weber's model of bureaucracies. One of the first to notice this was Parsons. See his introduction to Max Weber: *The Theory of Social and Economic Organizations,* New York 1947, pp. 58–60.

[2] The question of "who benefits" from concrete decisions is rarely – if even – raised in full. This would require a new orientation in political science and development of indicators – means of measurement in various sectors – of the benefits specific groups obtain as consequences of public policies.

[3] Instances of cognitive contributions to goal formation and social identifications are referred to in March & Simon: *Organizations,* New York 1958, pp. 65–82 and p. 151. The psychologists apply the concept "valenced cognition".

[4] See for instance Herbert Simon in Sola Pool: *Contemporary Political Science.* New York 1964, p. 95. Simon here refers to the conflicts between teachers and students in slum areas. The teachers are unable to see the limitations of the universality of their value system and they interpret conflicts as "artificial".

[5] The concept of program is discussed in March & Simon, op. cit., chs 6 and 7.

[6] See Victor Thompson: "Bureaucracy and Innovation", *Administrative Science Quarterly,* 10, 1965: 1–20.

[7] The Oslo Administration is headed by 8 Department Commissioners, (Rådmenn). The City Planning office is located in the Department of the Commissioner of Transportation (Kommunikasjonsrådmannen). The Commissioner of Transportation has law as his professional background, the Head of the City Planning Office and the Head of the Division for Master Planning are Architects.

[8] Herbert Simon: *Administrative Behavior.* New York 1965, p. 154.

[9] Ibid., p. 151.

[10] March & Simon: *Organizations,* op. cit., p. 11.

[11] Ibid., p. 11.

[12] *Administrative Behavior,* p. 205.

[13] I will emphasize again that the data are not based on exact measurement. By introducing formal techniques (scaling, indices) I feel I would have distorted the information more than providing higher validities.

[14] In 1968 the council was again invited to accept the proposed traffic system including the costly super highway through the city.

[15] This section draws heavily on March & Simon, op. cit., and Thompson, op. cit.