Herbert A. Simon:

Administrative Behavior

How organizations can be understood in terms of decision processes

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Herbert A. Simon: Administrative Behavior - How organizations can be understood in terms of decision processes

This is a note for the lecture on Simons perspective held on March 11, 1994 on Department of Computer Science, Roskilde University. It is based on the following literature:

Bakka, Jørgen Frode and Egil Fivesdal: *Organisationsteori. Struktur, kultur, processer*, [Organizational Theory. Structure, Culture, Processes], Nyt Nordisk Forlag, Arnold Busck, Denmark, 1986.

Højrup, Thomas: *Lønkapital under folkestyre. ØD-planernes strukturfejl & deres ophævelse*, [Capital from Wages Under Representative Government. The Plans for Economic Democracy, their Structural Shortcomings and How to Solve Them], EUCIS (European Center for International Security), Rosinante/Munksgaard, Denmark, 1989.

Simon, Herbert A.: *The Sciences of the Artificial*, The Massachusetts Institute of Technology, The Murray Printing Company, USA, 1969.

Simon, Herbert A.: "Applying Information Technology to Organizational Design", in *Public Administration Review*, Vol. 33, No. 3, May/June 1973, pp. 268-278.

Simon, Herbert A.: *Administrative Behavior. A Study of Decision-Making Processes in Administrative Organization*, Third Edition, The Free Press, Collier Macmillan Publishers, London, UK, 1976.

Background

Herbert A. Simon was 31 years old when he published his book "Administrative Behavior" (Simon, 76) in 1947. The aim of the book was to show how organizations can be understood in terms of their decision processes (Simon, 76, pp. ix & xxv). His central point is that decision-making is the heart of administration. The language and conceptual framework for describing administration must be based on the logic and psychology of human choice, i.e. economic theory and psychology. Simon got a Nobel's prize in 1978 for his contributions to science within decision processes in economic organizations. His book, "Administrative Behavior", was emphasized in particular (Bakka and Fivesdal, 86, p. 168).

Simons work is very comprehensive (and complex). In this section only some of his main points will be described; those which have had influence and impact on the Work Analysis.

Simons theories is based on a classical, ideal, and rational model of human decision-making The rational model does not exist in reality, and it is very easy to criticise. According to Simon the problem is not to criticise the model but to understand how decisions are made in organizations and to design organizations with a rationality as reflected in this model in mind. As a starting

point you have to have some idea of rationality. Rationality, however, must be seen as a variable. No one (individual or organization) can fulfil the requirements in the classic model of decisions processes. The model can be used in enquiries, to study how individuals and organizations develop goals and values, describe and judge different alternatives, gather and make use of information, and make conclusions - decisions (Bakka and Fivesdal, 86, pp. 169f).

> [I]f there were no limits to human rationality administrative theory would be barren. It would consist of the single precept: Always select that alternative, among those available, which will lead to the most complete achievement of your goals. The need for an administrative theory resides in the fact that there *are* practical limits to human rationality, and that these limits are not static, but depend upon the organizational environment in which the individuals decisions take place. The task of administration is so to design this environment that the individual will approach as close as practicable to rationality (judged in terms of the organization's goals) in his decisions (Simon, 76, pp. 240f).
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> *The central concern of administrative theory is with the boundary between rational and nonrational aspects of human social behavior* (Simon, 76, p. xxviii).

The description of Simons work is organized in the following sections:

- *The Economic Man* outlines the ideal and rational model for decision-making.
- *The Administrative Man* describes how decision-making is performed "in reality".
- *Simons Organizational Perspective* summarizes the organizational perspective as it appears from the book "Administrative Behavior". Also, Simons perspective and a more recent approach by Thomas Høyrup (Høyrup, 89) is juxtaposed.
- *Simons Design Perspective* describes some points related to the design and application of information technology. This section is based on the book "The Sciences of the Artificial" from 1969 (Simon, 69) and the paper "Applying Information Technology to Organizational Design" from 1973 (Simon, 73).

The Economic Man

Simon distinguishes between a normative and an empirical level, on how things should be and how they are, on values and facts.

> "[V]alue" in this study refers to *ought*'s, however certain, "fact" to *is*'es, however conjectural (Simon, 76, p. 5).

Decisions in an organization will be based on premises including both empirical and normative elements. These two different kinds of premises are called factual and value premises. Factual premises are made from knowledge and information about the organization and its environment. Value premises comprises goals and moral and law-given constraints (Bakka and Fivesdal, 86, p. 170). Simon gives an example on values and facts concerning the decisions for a park foreman:

> For a park foreman the alternatives take the form of grass-cuttings, planting, road maintenance work, clean-up work, and so forth; the values are legislatively and socially determined standards of appearance, cleanliness, recreation use-value; the facts are budgets, work methods, unit costs. (Simon, 76, p. 198)

To make a rational decision is to decide to do something to achieve a goal; to decide a mean to achieve en end. Means and ends must be considered as connected in a hierarchical chain.

> In the process of decision those alternatives are chosen which are considered to be appropriate means of reaching desired ends. Ends themselves, however, are often merely instrumental to more final objectives. We are thus led to the conception of a series, or hierarchy, of ends. Rationality has to do with the construction of means-ends chains of this kind [...] The fact that goals may be dependent for their force on other more distant ends leads to the arrangement of these goals in a hierarchy - each level to be considered as an end relative to the levels below it and as a mean to the levels above it (Simon, 76, pp. 62f).

An analysis of rational behavior in terms of a means-end hierarchy have to take into consideration certain limitations embedded in this abstraction:

> (a) that it obscures the comparative element in decision-making, (b) that it does not achieve a successful separation of the factual elements in decision from the value elements, and (c) that it gives insufficient recognition to the time variable in purposive behavior (Simon, 76, p. 66).

Simon claims that a theory of decisions in terms of alternative behavior possibilities and their consequences meets all above objections. This theory describes the task of decision as involving three steps:

> (1) the listing of all the alternative strategies[1]; (2) the determination of all the consequences that follow upon each of these strategies; (3) the comparative evaluation of these sets of consequences. (Simon, 76, p. 67).

Within these three steps the function of knowledge in the decision-making process is then to determine which consequences follow upon which of the alternative strategies (Simon, 76, p. 68), the problem of choice becomes one of describing consequences, evaluating them, and connecting them with behavior alternatives (Simon, 76, p. 77), and this evaluation involves a listing of the consequences in their order of preference, and the choice of that strategy which corresponds to the alternative highest on the list (Simon, 76, p. 73).

This rational decision-model, also known under the name "economic man", are summarized in Bakka and Fivesdal, 86 in 5 items:

- You can always make a decision when you face a set of alternatives.
- You rank the consequences of the alternatives according to your preferential treatment (value-scale).
- The preferential treatment is transitive (A > B > C, and not C > B).

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1 Simons definition for a strategy is as follows: "Decision, or choice, [...] is the process by which one of [the] alternatives for each moment's behavior is selected to be carried out. The series of such decisions which determines behavior over some stretch of time may be called a *strategy*" (Simon, 76, p. 67).

- You will always choose the alternative which is highest on your value-scale (maximization)
- You will always make the same choice if/when the situation recur. (Bakka and Fivesdal, 86, p. 166, authors translation)

The Administrative Man

The economic man represents the objective rationality in an ideal model. In reality there are of course limitations to this model. You are limited by unconscious skills, habits, and reflexes; by your values and conceptions of purpose, which may diverge from the organization goals; and by the extent of your knowledge and the information available (Simon, 76, p. 241). Actual behavior is thus limited compared to objective rationality in at least three ways:

1) Rationality requires a complete knowledge and anticipation of the consequences that will follow on each choice. In fact, knowledge of consequences is always fragmentary.
2) Since these questions lie in the future, imagination must supply the lack of experienced feeling in attaching value to them. But values can be only imperfectly anticipated.
3) Rationality requires a choice among all possible alternative behaviors. In actual behavior, only a very few of all these possible alternatives come to mind. (Simon, 76, p.81)

Given these limitations a model of rational behavior by the administrative man is outlined. The administrative man as a model compared to economic man is different in two major ways:

- Whereas economic man maximizes - selects the best alternative from among all those available to him, his cousin, administrative man, satisfices - looks for a course of action that is satisfactory or "good enough."
- Economic man deals with the "real world" in all its complexity. Administrative man recognizes that the world he perceives is a drastic simplified model [...] He makes his choices using a simple picture of the situation that takes into account just a few of the factors that he regards as most relevant and crucial. (Simon, 76, pp. xxix f)

The administrative man is summarized in Bakka and Fivesdal, 86 in 4 items[2]:

- The administrative man will always have a simplified model of the situation in question.
- The administrative man will seek only a limited number of alternatives and/or information about the consequences of different alternatives.
- Decision processes are oriented towards finding and choosing among satisfying alternatives. Only occasionally a decision is driven by maximizing.
- As the administrative man is satisfied with a limited knowledge of the situation that she must consider, she can make decisions from relatively simple heuristics, which does not require an impossible or unrealistic overview and insight. (Bakka and Fivesdal, 86, pp. 170f, authors translation)

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2 Besides administrative man Bakka and Fivesdal mentions 3 other models that describe how decisions are made "in reality": muddling through, garbage can, and political models (Bakka and Fivesdal, 86, pp. 171-178).

Simons Organizational Perspective

Simon qriticize the common principles of administration[3]. These principles claim that administrative efficiency is increased by:

1) a specialization of the organization according to purpose, process, clientele (customers), or place;

2) arranging the organization in a determinate hierarchy of authority;

3) limiting the span of control at any given point in the hierarchy to a small number (Simon, 76, pp. 20f).

His central thesis is that the applicability of administrative principles must be based upon an understanding of the underlying conditions of the administrative process in terms of decisions (Simon, 76, p. 240). The basic and appropriate analytic unit should be the premises for the decisions (Simon, 76, p. xxxviii).

How does the organization fit the individuals behavior into an overall pattern; how does it establish and maintain the premises that influences his decisions? Simon distinguish between two principal sets of mechanisms or aspects of influence, external and internal:

- External mechanisms are "the stimuli with which the organization seeks to influence the individual" (Simon, 76, p. 123), "those that initiate behavior in a particular direction" (Simon, 76, p. 94).

- Internal mechanisms are those "which determines his response the stimuli" (Simon, 76, p. 123), "those that cause behavior to persist in a particular direction once it has been turned in that direction" (Simon, 76, p. 94).

Internal mechanisms are mainly concerned with individual psychological factors ("their description and functioning is a problem for psychology") while external mechanisms are in focus since they "can be invoked by someone other than the person they are intended to influence, and consequently, they play a central role in administrative organization" (Simon, 76, p. 94). Organizational influence should thus be seen within the external mechanisms.

The organizational influences are of two principal kinds, expectations and stimuli/attention-directors:

- Organizations and institutions permit stable expectations to be formed by each member of the group as to the behavior of the other members under specified conditions.
- Organizations and institutions provide the general stimuli and attention-directors that channelize the behaviors of the members of the group, and that provide those members with the intermediate objectives that stimulate action. (Simon, 76, pp. 100f)

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[3] As they were, according to Simon, when he published "Administrative Behavior" in 1947.

Organizational influence are manifested through five mechanisms: division of work, establishing of standard practices (standard operational procedures), the transmission downwards of decisions, providing channels of communication, and training and indoctrinating (internalization) (Simon, 76, pp. 102f). These mechanisms comprises different influential processes or modes of influence:

- *Authority*, defined as "the power to make decisions which guide the actions of another. It is a relationship between two individuals, one "superior", the other "subordinate." The superior frames and transmits decisions with the expectation that they will be accepted by the subordinate. The subordinate expects such decisions, and his conduct is determined by them [...] *he sets himself a general rule which permits the communicated decision of another to guide his own choices* (i.e. to serve as a premise of those choices) *without deliberation on his own part on the expedience of those premises*." (Simon, 76, p. 125)

- *Communication*. Formal communication is expresses by media's like the spoken word, memoranda, letters, records, reports, and manuals. Informal communication is build around the social relationships of the members of the organization (Simon, 76, pp. 157-162).

- *Training* "prepares the organization member to reach satisfactory decisions himself, without the need for constant exercise of authority or advice" (Simon, 76, p. 15). Training includes both "pre-service" (educational qualifications) and "in-service" (day-to-day supervision and formal training within the organization). "Training is applicable to the process of decisions wherever the same elements are involved in a large number of decisions. Training may supply the trainee with the facts necessary in dealing with these decisions; it may provide him a frame of reference for his thinking; it may teach him "approved" solutions, or it may indoctrinate him the values in terms if which his decisions are to be made" (Simon, 76, p. 170).

- *The criterion of efficiency*, which "demands that, of two alternatives having the same cost, that one be chosen which will lead to the greater attainment of the organization objectives; and that, of two alternatives leading to the same degree of attainment, that one be chosen which entails the lesser cost" (Simon, 76, p. 122). Since all administrative decisions are based on the limitation given in the resources available, "the choice among possibilities can always be framed as a choice among alternatives involving the same cost [largely measured in money terms] , but different positive values". The problem is of "comparing the values which are attained by the different courses of action. The efficiency criterion neither solves nor avoids this problem of comparability" (Simon, 76, pp. 179f).

- *Organizational identification and loyalty*. This concerns the "process whereby the individual substitutes organizational objectives (service objectives or conservation objectives) for his own aims as the value-indices which determine his organizational decisions" (Simon, 76, p. 218). This mean that "*a person identifies himself with a group when, in making a decision, he evaluates the several alternatives of choice in terms of their consequences for the specified group*" (Simon, 76, p. 205) in contrast to personal motivation, where "his evaluation is based upon an identification with himself or his family" (Simon, 76, p. 206).

One main function of above organizational influences is to coordinate the activities of the members in the organization. The proper mean for maintaining rationality at a high level is planning (Simon, 76, p. 99). This involves the development of a plan for all members of the organization involved, the communication of relevant portions of this plan to each member, and ensuring that each member is willing to be guided by the plan (Simon, 76, pp. 103-108)

Planning involves general decisions that influences future decisions by:

- limiting future possibilities by providing a strategy,
- guiding future decisions by providing particular values as a decision criteria (e.g. in terms of stated goals).

Simon views organizations as systems in equilibrium. The equilibrium balances incoming contributions (money, time, and effort) with inducements in terms of the organizational goal itself, the conversation and growth of the organization, and contributions like salaries. The equilibrium is maintained by the "control group", i.e. management (Simon, 76, p. 122).

The organization offers three kinds of inducements that corresponds to three kinds of interest groups[4]:

1) The organizational goal itself serves the "customer"[5], who contribute money to the organization in return for its products:

> In order to survive, the organization must have an objective that appeals to its customers, so that they will make the contributions necessary to sustain it. Hence, organization objectives are constantly adapted to conform to the changing values of customers, or to secure new groups of customers in place of customers who have dropped away. The organization may also undertake special activities to induce acceptance of its objectives by customers - advertising, missionary work, and propaganda of all sorts (Simon, 76, p. 114).

2) The conversation, growth, and profit of the organization serves the "entrepreneur". The entrepreneur is interested "in nonmaterial values, such as prestige and power, as well as profit" (Simon, 76, p. 117). The entrepreneurs "are distinguished by the fact that their decisions ultimately control the activities of employees" (Simon, 76, p. 16).

3) Wages are offered to the employees in return for the time and efforts they provide.

> [T]hose participants in organization who are called its employees are offered a variety of material and non-material incentives, generally not directly related to the attainment of the organization objective nor to the size and growth of the organiza-

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4 Simon notes that the description of organization members, in terms of the inducements they receive, is only one possible classification. Other classifications could be in terms of the contributions they make or in terms of who exercises the control (Simon, 76, p. 112).

5 The "customer" refers to any individual for whom the organizational objective has personal value, e.g. customer, legislator, or volunteer (Simon, 76, p. 114).

> tion, in return for their willingness to accept organizational decisions as the basis for their behavior during the time of their employment (Simon, 76, p. 117).

Though this classification may provide a somewhat "old fashioned" description of the entrepreneurs owing and managing the organization with its employees and customers, the idea of viewing organizations as systems in equilibrium serving different groups is still of current interest.

A recent book by the ethnologist Thomas Højrup[6] has a similar perspective. He describes (commercial) organizations as a temporary rendezvous involving three different "ways of living" or life styles: the investor, the wage earner or employee, and the expert or the careerist (Højrup, 89, pp.94-99):

- The investor views organizations as an object for investment where they invests money in return for a share of the profit. The interest of the investor is to make the organizations draw upon his capital in return for a dividend and capital gain. The investor must ensure the actual value of his capital by moving it from less lucrative and productive organizations to organizations believed to be more profitable.

- The employee views the organizations as possible workplaces. They offer their (working) time to the labour market. To the employee the interest is getting the job which offers the best salary *and* working conditions.

- The expert or careerist comprises e.g. managers and scientists. They offer their talents and capacity to organizations in order to create a rapid or long-term growth. Their interest is the ability to offer an expertise that only a few can offer so that this expertise can give the organization the monopoly or an advantage compared to the competitors. The career oriented experts thus compete with each other in getting desirable post' and field of responsibilities which they can use in the development of their own ideas, talents, experiences, and methods. The secret is to make oneself irreplaceable and to turn to another organization whenever a better position is offered.

In this perspective the permanent resources are capital, working capacity or manpower, and expertise - not the organization. As long as the organization is productive, i.e. is able to maintain the equilibrium, it can attract these three life styles - otherwise the organization will cease to exist, and the involved life styles will be separated and linked in other ways in other organizations.

Simons Design Perspective

Simons design perspective appears from his book "The Sciences of the Artificial" from 1969 (Simon, 69) and the paper "Applying Information

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6 Højrup, Thomas: *Lønkapital under folkestyre. ØD-planernes strukturfejl & deres ophævelse*, [Capital from Wages Under Representative Government. The Plans for Economic Democracy, their Structural Shortcomings and How to Solve Them], EUCIS (European Center for International Security), Rosinante/Munksgaard, Denmark, 1989.

Technology to Organizational Design" from 1973 (Simon, 73). These sources are described in the following.

In the book "The Sciences of the Artificial", as the title indicates, Simon outlines a research program for the science of artificial "things" which very broadly can be understood as all man made things, including the design of i.e. information systems. "The Sciences of the Artificial" had a considerable influence on the succeeding research programs within Artificial Intelligence.

Viewed as a design perspective, the book is based on a claim that "artificial things can be described in terms of functions, goals, adaption" (Simon, 69, p. 8).

Simon illustrates this by an example with a clock:

> Fulfilment of purpose or adaption to a goal involves a relation among three terms: the purpose or goal, the character of the artifact, and the environment in which the artifact performs. When we think of a clock, for example, in terms of purpose we may use the child's definition: "a clock is to tell time". When we focus our attention to the clock itself, we may describe it in terms of arrangements of gears and the application of the forces of springs or gravity operating on a weight or pendulum.
>
> But we may also consider clocks in relation to the environment in which they are to be used. Sundials performs as clocks *in sunny climates* - they are more useful in Phoenix than in Boston and of no use of all during the Arctic winter. Devising a clock that would tell time on a rolling and pitching ship, with sufficient accuracy to determine longitude, was one of the great adventures of eighteenth-century science and technology. To perform in this difficult environment, the clock had to be endowed with many delicate properties, some of them largely or totally irrelevant to the performance of a landlubber's clock (Simon, 69, pp. 8f).

Within this concept the artifact is described as the interface between an inner and an outer environment.

> An artifact can be thought of as a meeting point - an "interface" in today's terms - between an "inner" environment, the substance and organization of the artifact itself, and an "outer" environment, the surroundings in which it operates. If the inner environment is appropriate to the outer environment, or vice versa, the artifact will serve its intended purpose (Simon, 69, p. 9).

The argumentation for the relevance of this level of abstraction is twofold: from the standpoint of the outer environment, the behavior of a system can often be predicted from knowledge of the system's goal and its outer environment. Different inner environments may accomplish identical or similar goals in identical or similar environments. "There is often a corresponding advantage in the division from the standpoint of the inner environment. In very many cases whether a particular system will achieve a particular goal or adaptation depends on only a few characteristics of the outer environment and not at all on the detail of that environment" (Simon, 69, p. 11).

The design process is thus concerned with systems with a function and a goal towards an outer environment adapting to the corresponding demands and needs from this outer environment.

> The artificial world is centred precisely on this interface between the inner and outer environments; it is concerned with attaining goals by adapting the former to the latter. The proper study of those who are concerned with the artificial is the way in which that adaptation of means to environments is brought about - and central to that is the process of design itself (Simon, 69, p. 132).

Simon illustrates this by a parable of an ant and its laborious way across a beach:

> We watch an ant make his laborious way across a wind- and wave-molded beach. He moves ahead, angles to the right to ease his climb up a steep dunelet, detours around a pebble, stops for a moment to exchange information with a compatriot. Thus he makes his weaving, halting way back to his home. So as not to anthropomorphize about his purposes, I sketch the path on a piece of paper. It is a sequence of irregular, angular segments - not quite a random walk, for it has an underlying sense of direction, of aiming toward a goal.
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> [...] Whoever made the path, and in whatever space, why is not straight; why does it not aim directly from its starting point to its goal? In the case of the ant [...] we know the answer. He has a general sense of where home lies, but he cannot foresee all the obstacles between. He must adapt his course repeatedly to the difficulties he encounters and often detour uncrossable barriers. His horizons are very close, so that he deals with each obstacle as he comes to it; he probes for ways around or over it, without much thought for future obstacles. It is easy to trap him into deep detours.
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> [...] Viewed as a geometric figure, the ant's path is irregular, complex, hard to describe. But its complexity is really a complexity in the surface of the beach, not a complexity in the ant. On that same beach another small creature with a home at the same place as the ant might well follow a very similar path.
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> [...] These speculations suggest a hypothesis [...] : *An ant, viewed as a behaving system, is quite simple. The apparent complexity of its behaviour over time is largely a reflection of the complexity of the environment in which it finds itself.* (Simon, 69, p. 63f).

A look at the ant's movements alone provides a very complex and apparently even irrational pattern. If the perspective includes the environment, the beach, it reveals a more obvious picture and, on the face of it, the ant itself seems more simple and its apparently complex behavior seems to be a result of the structure and nature of the environment.

In the paper "Applying Information Technology to Organizational Design" published in 1973 (Simon, 73), Simon describes the design of information systems in an organizational context. Simon knows that organizational design and the design of information technology are mutual dependent. As a starting point he describes some general observations in organizations:

> Any division of labor among decisional subsystems creates externalities, which arise out of the interdependencies among the subsystems that are ignored. What is wanted is a factorization that minimizes these externalities and consequently permits a maximum degree of decentralization of final decision to the subsystems, and a maximum use of relatively simple and cheap coordinating devices like the market mechanism to relate each of the decisional subsystems with each others.
>
> Not only must the size of the decision problems handled by organizations be reduced to manageable proportions by factorization, but the number of decisions to be processed must be limited by applying good principles of attention management .
>
> [T]he scarce resource is not information; it is processing capacity to attend to information. Attention is the chief bottleneck in organizational activity (Simon, 73, p. 270).

These observations leads to two requirements on organizational design:

> [T]hat the totality of decision problems be factored in such a way as to minimize the interdependence of the components; and that the entire system be so structured as to conserve the scarce resource, attention. (Simon, 73, p. 271)

Concerning the design of information systems the recommendation is that the design must be based on an analysis of the decision-making system and the

information needed as the basis for the decisions. It is a fallacy to think that "more information is better": this was true earlier, today it is attention which is the scarce resource (Simon, 73, p. 271). The information systems should thus be designed to match the limits of the attentional resources (Simon, 73, p. 274).

Simon concludes that the major problems of organization are problems of organizing information (storage and processing) and that a general design principle should be to analyse the information system (organization and technology) in abstraction from agency and department structure (Simon, 73, p. 276).

He states three guidelines or heuristics for design when considering improving performance by adding "an additional component (man or machine) for an information-processing system" (Simon, 73, p. 274):

1 Its output is small in comparison with its input, so that it conserves attention instead of making additional demands on attention;
2 It incorporates effective indexes of both passive and active kinds (active indexes are processes that automatically select and filter information for subsequent transmission);
3 It incorporates analytic and synthetic models that are capable not merely of storing and retrieving information, but of solving problems, evaluating solutions, and making decisions.