Chapter 5
Active Expertise

In the preceding chapters, we have described e-expertise by assuming (implicitly or, par excellence, explicitly) that all participants of expert activity follow the primary goals of expertise, i.e., to provide maximum complete, adequate and reliable information on the object or subject of expertise for Principal's decision-making.

In particular, we have supposed that (a) expertise organizers form an expert group which is able to give most complete and objective assessments for the object or subject of expertise, (b) a methodological group chooses certain procedures of expert data acquisition and processing for generating the most compete and exhaustive answer and (c) experts proper report their true assessments, being guided purely by their professional knowledge and ethics. It is important that experts comprehend the goals and interests of a Principal. However, all participants of expert activity represent people with personal interests. Generally, each participant can

- demonstrate *strategic behavior* according to his personal interests (preferences, partiality);
- recognize the incompleteness of his *awareness* (about the goals, interests and opinions of other participants, various information);
- act *unconscientiously*, i.e., deceive or neglect professional duties.

In other words, participants of expertise can be active subjects, *rational* in the following sense. Under available opportunities, they strive for satisfying personal interests (including selfish ones).

In the context of the expertise organization problem, the major importance belongs to the case when some participants of expertise fail to be "*independentexperts*." An expert, several or even all experts can have certain preferences regarding the results of expertise, possibly contradicting the interests of a Principal or other experts. Such subjects can show *active* (*strategic*) *behavior*, i.e., exert certain impact on the process of expertise in order to distort it (thereby, making closer to a desired result).

Active expertise is a type of expertise, where the strategic behavior (biased actions) of some participants and their manipulation capabilities play an appreciable role. (Table 5.1)

D. Gubanov et al., *E-Expertise: Modern Collective Intelligence*,
Studies in Computational Intelligence 558, DOI: 10.1007/978-3-319-06770-4_5,

Table 5.1 Basic problems of manipulation

Object	Direction of Manipulation		
	Principal → Expert	Expert → Principal	Expert → Expert
Staff	1. Forming a desired staff of an expert group	6. Making a decision to participate (or refuse from participation) in an expert group by an expert	9. Influencing the decisions of other experts to participate in an expert group
Interests	2. Applying a personalized incentive scheme (for each expert) or a unified motivation scheme (for all members of an expert group)	7. Offering financial guarantees (compensations, honoraria) for obtaining a desired expertise result for an expert	10. "Income" sharing with other experts for obtaining a desired expertise result
Set of feasible messages	3. Forming a query to experts or a scenario and conditions of expertise conduct (see Sects. 3.2 and 3.3)	–	–
Expertise procedure	4. Choosing an expertise procedure (e.g., processing methods for experts' opinions) for obtaining a desired result	8. Misrepresenting information reported by experts	11. Coordinating reported information with other experts
Awareness	5. Forming certain beliefs of experts about the opinions of other members of an expert group	–	12. Forming certain beliefs of experts about the opinions of other members of an expert group

Expertise procedures with neutralized manipulation capabilities (more specifically, where all participants benefit by truth-telling and conscientious actions) are called *strategy-proof expertise procedures*. For detailed discussion of strategy-proof expertise, we refer to [26, 54, 55, 56, 80].

Goals of manipulation. We have mentioned that manipulation in active expertise lies in strategic actions of participants in order to modify the result of expertise according to their goals. Which are these goals? There exist three general groups of *goals of manipulation* by experts or coordinator:

(1) to achieve a personal desired result of expertise or to make the final result of expertise as close to this result as possible;
(2) to avoid a personal undesired result or to make the final result of expertise as far from this result as possible;
(3) to increase the personal influence (rating, reputation) of an expert as much as possible, even with prejudice to Principal's position.

The last situation appears widespread among experts with regular participation in expertise. In the last analysis, it facilitates satisfaction of goals 1 or 2 (in addition to personal ambitions of an expert).

Subjects and objects of manipulation. Clearly, participants of expert activity have different motivation to manipulation, different capabilities and methods of manipulation. To systematize them, we should identify *subjects of manipulation* (who performs manipulation) and *objects of manipulation* (what is manipulated).

For instance, a coordinator can influence the result of expertise by forming the *staff* of an expert group or an *agenda* (a list of discussed questions and possible answers to them). Moreover, he can suggest a certain procedure of e-expertise for "pushing through" a required expert decision. On the other hand, experts can distort reported information, thus hyperbolizing the advantages of an expertise result suggested by them (striving for personal *professional interests* or *lobbying* the interests of some third parties).

It is possible to classify experts as follows: experts working on Principal's order and honorarium; experts representing the interests of lobby structures (e.g., business companies) and being paid by such structures; experts representing the interests of public organizations, clubs, networked communities, etc. Experts may have no information on their clients and receive their honoraria from an "independent" fund.

Therefore, it seems reasonable to classify different manipulation phenomena in expertise based on some formal model of active expertise. Such approach assists in comprehension of nonformalized (qualitative, implicit) components of manipulation.

Most adequate formalization frameworks for manipulation processes include decision theory, game theory [76], collective choice theory [1, 9], and theory of control in organizations [26, 80]. A common feature of these frameworks is treating expertise as a *game*, i.e., a mathematical model of rational subjects' interaction.

According to the assumptions on expertise structure [see Fig. 2 (The interaction of basic participants) of Inroduction], the game-theoretic model of expertise is described by the following components:

1. *The staff of expertise participants*:
   1.1. a Principal[1] (P);
   1.2. experts (E);
   1.3. a moderator (M).
2. *The goals and interests* of expertise participants in terms of correlation between desired and implementable results of expertise.

[1] In this section, the conception of a Principal covers a Principal proper (who makes decisions based on expert information), the coordinator of expertise or third parties interested in expertise results.

3. *The mechanism of expertise*, which consists of:
   3.1. the sets of feasible messages (answers, assessments) of experts;
   3.2. an expertise procedure (see Chaps. 2 and 3), including
      3.2.1. the number of interaction periods of experts and the period of expertise;
      3.2.2. the order of reporting by experts;
      3.2.3. the methods of expert information acquisition and processing to obtain expertise results;
4. *The awareness* of all expertise participants about:
   4.1. the object or subject of expertise;
   4.2. other components of the model (the order of reporting, expertise procedure, etc.);
   4.3. the awareness of other participants;
   4.4. the Situation awareness [118].

Each of the stated components in the expertise model (staff, goals, mechanism and awareness) can be the object of manipulation.

In principle, any expertise participant may perform manipulation. Complete description calls for considering the exhaustive list of persons concerned, *viz.*, direct participants of expertise and other persons being able to influence expertise participants. However, this chapter focuses on the problem of strategy-proofness in expertise. Therefore, we believe that the list of expertise participants comprises just two persons–a Principal (simultaneously acting as a moderator) and experts.

Consequently, such assumption defines three *directions of manipulation*:

1. a Principal influences experts;
2. experts influence a Principal;
3. experts influence experts.

The problems of expertise results' manipulation: a classification. By systematizing the objects and directions of manipulation, one easily outlines 15 possible basic problems of manipulation (see Table 5.1).

Yet, situations when experts directly influence the sets of feasible messages or the a priori awareness of a Principal could be hardly imagined. And so, there are 12 problems of manipulation with serial numbering in Table 5.1. In the sequel, we analyze them in brief and overview the existing research results of corresponding formal models.

5.1 Principal Influences Experts

The following questions may arise naturally. Why should a Principal or coordinator of expertise manipulate experts? Would an appropriate term be *control*? In this context, we outline several key features. First, any expertise is conducted

under existing external conditions (normative and legal, informational, technological and other conditions); they can impose essential constraints on expertise mechanisms and apply certain requirements to expertise results. Second, a Principal can lie on an intermediate level in the hierarchical management system of a large organization. By manipulating expertise results, he influences decision-making at higher levels of the hierarchy. Third, a Principal may conceal his actual intentions. And fourth, in some situations a Principal appears unable to express his informational needs and intentions. Therefore, any managerial actions of a Principal, directed towards achievement of other goals (differing from officially declared ones during expertise) represent *manipulation*.

To proceed, consider Principal's capabilities of influencing different objects of manipulation (see Error! Reference source not found.).

1. Principal manipulates the staff of experts. Actually, guaranteeing a required result of expertise by forming a "specific" *staff of an expert group* makes a "classical" example of manipulation (especially, in normative expertise). Take a Principal demonstrating strategic behavior; from his viewpoint, the problem of expert staff formation admits the following statement. Find the minimal number of controlled experts to-be-added in the staff for ensuring a desired result.

Besides normative expertise, a similar type of manipulation is widespread in corporations' management (decision control at stockholders' meetings [7, 37]).

Formal analysis of such manipulation may involve theoretical results from staff control problems in organizational systems [79, 80].

This type of manipulation by a Principal can serve for mercenary ends (while defining the required number of "decoy" experts) or for establishing the presence of such manipulation in expert procedures and its consequences.

In political sciences there exists a series of research works focused on manipulation issues at elections [5] and voting in stock corporations [7, 37]. The cited publications place an emphasis on organizational and normative anti-manipulation measures. Other investigations are dedicated to the approaches of expert group formation with accelerated *convergent* decision-making, see [89].

In the case of e-expertise, this type of manipulation can attract Principal's attention during open expertise (the number and staff of participants is not fixed). Unfortunately, this issue has not still been analyzed.

2. Principal manipulates the interests of experts. Another classical type of manipulation lies in "purchasing" the opinion of an expert ("bribery"). Due to the variety of methods of such manipulation, the importance of revelation and anti-manipulation techniques in practice, we study merely most significant aspects of such manipulation in e-expertise.

This type of manipulation belongs to the class of *motivational control* [26, 80]. Suppose that it is possible to estimate (positive or negative) payoffs of all or specific experts from each possible result of expertise. Then it appears possible to estimate the "incentives" (or "penalties") to-be-assigned to experts by a Principal for obtaining a desired result of expertise. In other words, one can design an appropriate "incentive scheme" for experts.

Here we should discriminate between two cases as follows. In the first case, a common (*unified*) incentive scheme is constructed for all experts to motivate them report required data to a Principal. Solution of this problem may employ classical approaches from microeconomics [42] and theory of control in organizations [26, 80]. In the second case, a Principal applies *personalized* incentive schemes to specific experts (generally, in secret from other experts). This type of control actions can be interpreted as *corruption.* Mathematical models of corruption are explored in [45, 96, 110].

In the conditions of e-expertise (very many participating experts or an open expertise procedure), the given type of manipulation occurs when a Principal is able to choose most authoritative experts (whose opinions are considered by residual experts or whose assessments have highest weight). Meanwhile, e-expertise procedures generally possess openness, and the costs of such manipulation may grow significantly.

Principal manipulates expertise mechanism. In this book, an *expertise mechanism* is a set of the following components:

1. query to experts with questionnaire formalization (questions) and an order of their presentation to experts;
2. feasible answers to posed questions;
3. moderator choice and the influence of moderation definition;
4. an order of interaction among experts, the object or subject of expertise, a Principal during formation and reporting of expert assessments;
5. acquisition/processing methods for expert messages.

According to the game-theoretic approach, it seems reasonable to decompose this set in two parts:

1. A *set of feasible messages* (components 1 and 2 above).
2. *Expertise procedures* (components 3, 4 and 5 above).

3. Principal manipulates the set of feasible messages of experts. This type of manipulation possesses a broad range and includes, in the first place, achievements of weakly formalizable theories (psychology, linguistics, etc.). The form and sequence of questions, the list of feasible answers has a strong impact on the final result. Among classical examples of such manipulation, we should mention Zenon's aporia (e.g., *Achilles* and the *Tortoise).*

Today, e-expertise may involve certain approaches to formalize such manipulation and response to it (of course, after appropriate adaptation). We highlight investigations focused on analysis and formalization of *decision-making psychology*. Furthermore, the framework of *cognitive modeling* assists in verifying the correctness of posed questions and possible substitution of notions during elaboration of decisions [2]. Final decision may depend strongly on the precise statement of questions to experts.

According to *agenda theory* [17, 71], almost any decision can be guaranteed by choosing the content and sequence of questions (under existing information on the

preference of all experts). This fact allows designing agendas to achieve necessary final decisions.

Modern economic research of decision-making provides more and more evidence of the following phenomenon. People often make decisions being guided by *herd instinct* [30] or previous experience [30, 34]. In particular, we refer to *situational control*, usage of *typical decisions*, etc. By a natural conjecture, such behavior damps the impact of manipulation. For e-expertise, a substantial role belongs to that experts can interact with each other on discussion sites.

Finally, there exist mathematical models showing the *conformism* of agents [41]. A promising direction of research concerns exploring the impact of conformity behavior on Principal's manipulation capabilities.

4. Principal manipulates the procedure of expert messages' treatment. A Principal may perform manipulation by choosing certain procedures of acquisition and processing of expert messages (including the order of reporting and the number of iterations), which lead to a desired result of expertise under other parameters fixed.

Such manipulation takes place in the distribution of seats among several political factions in a national parliament according to the proportional representation principle. By selecting a rule of seats' definition, one can make a certain faction uninfluential; in other words, if this faction joins any coalition, the latter fails to become a *winning* coalition (to push through a decision supported by this coalition). Influence level analysis for specific factions bases on *influence indices* [6, 75]. They can be used for manipulation (selection of a proportional representation rule) and for prevention of such manipulation.

Another modeling tool for manipulation processes and anti-manipulation measures is proposed by *implementability theory* [48]. This framework assesses the feasibility of implementing a specific aggregation procedure of expert appraisals under strategic behavior of experts.

Theory of organizational systems gives strategy-proof *consent mechanisms*[2] [26]. Some direction (e.g., of investing) is selected as the *basic* one (the development of other directions is impossible without the development of the basic direction). Expert commissions are created for other directions to generate a consentient decision on the shares of investments into the development of these directions with respect to the basic direction (the number of expert commissions equals the number of directions minus 1). The information reported by an expert commission is used to allocate available financial resources to a corresponding direction. Obviously, the final allocation of resources appreciably depends on the choice of the basic direction. This is the Principal's leverage during manipulation.

E-expertise models [43, 44] study the procedures of weighted assessments, where the weights of experts are determined using their voting history. Interestingly, the choice of weights' definition (rating assignment rules for experts) strongly affects the behavior of experts and expertise results.

[2] The term "consent mechanism" also means the mechanism of a group consensus which serves for elaborating consentient decisions on the goals and ways of their achievement.

5. Principal manipulates the awareness[3] of experts. Such manipulation represents *informational control* [78, 80]. There exist three types of informational control:

(a) influencing the beliefs of experts about a subject domain (*informational regulation*);
(b) influencing the beliefs of experts about the awareness of their colleagues (*reflexive control*);
(c) reporting some information on the expected result of expertise (*active forecasting*).

A model analyzing the capabilities of informational control of experts is examined in [78]. The authors demonstrate that, under a fixed treatment procedure of expert messages, a Principal can ensure almost any result of expertise by reporting confidentially appropriate information on the opinions of certain experts to other experts.

In comparison with conventional expertise, the framework of e-expertise provides considerably smaller manipulation capabilities for the awareness of different experts. A key notion in the theory of informational control is decision *stability* [78]. In terms of expertise, this notion means that the result observed by experts must coincide with their expected result (under the information on the beliefs of other experts reported by a Principal). If the Principal performs informational manipulation, the final decision appears unstable in most cases. Subsequently, experts may distrust the information reported by the Principal. However, stability is not so important in one-shot expertise. The interaction between experts and a Principal in e-expertise takes place many times, and the property of stability plays a major role, which restricts the capabilities of informational manipulation.

5.2 Experts Influence Principal

This direction of manipulation is traditional in *social choice theory* and *theory of organizational systems*. Nevertheless, the general interpretation of manipulation is somewhat wider. Considering different objects of manipulation, we dwell on most important results of these theories in the context of e-expertise.

6. Expert manipulates the staff of experts. Actually, the staff of an expert group is selected by a Principal; therefore, the only direct influence of an expert on the staff of an expert group lies in his rejection from participation in expertise. Suppose that the procedure of expert group formation involves experts (see formation methods for expert groups in Chaps. 2 and 4). In this case, such procedure can be treated as a component of a corresponding expertise mechanism, whereas

[3] The awareness of a subject is information on essential parameters and the awareness of other subjects, used by this subject in his decision-making.

experts' recommendations act as a part of information supplied by experts to the Principal. In the course of expertise, an expert can provoke discussions of different questions not related to the object or subject of expertise, thus "guiding" it away. And so, the object of manipulation is a specific implementation of expertise mechanism.

7. Expert manipulates the interests of Principal. Unfortunately, a priori there exists a possibility that an expert influences decisions of the Principal (e.g., by suggesting certain preferences to the latter and provoking his corruption behavior).

We identify two types of material motivation of the Principal by an expert: (1) classical corruption ("bribery" payment to the Principal, see references in Sect. 5.2) and (2) when the rules of financial participation (or responsibility) of experts form a legitimate component of a decision-making procedure [42, 49]. The second type corresponds to manipulation of expertise mechanism.

Expert manipulates the set of feasible messages, thereby causing deviant processes in expert decision-making. We believe that this case of manipulation is inadmissible. Really, if an expert participates in formulation of questions for expertise, this is a component of the procedure of expert information treatment (acquisition and processing), and the set of feasible messages includes information an expert may report to the Principal during expert group formation.

8. Expert manipulates the procedure of expert messages' treatment. An expert manipulates a procedure in the following way. Under a procedure selected by the Principal and a well-defined set of feasible messages, an expert chooses a message leading to his maximal utility. This agrees with the *classical comprehension of* "*manipulation*."

We underline that most results of formal models' analysis in social choice theory and theory of control in organizations apply to exactly this case of manipulation. A major problem consists in designing strategy-proof mechanisms. The nontrivial character of this problem directly follows from a classical result of social choice theory known as *the Gibbard-Satterthwaite theorem* [9]. It claims that, under arbitrary preferences of experts, the only strategy-proof mechanisms are *dictator mechanisms*, where the final appraisal is dictated by an a priori defined expert (the opinions of other experts becomes inessential). Nevertheless, under certain assumptions, there exist other (not so trivial) strategy-proof mechanisms of expertise. Most research in social choice theory concentrates on derivation of existence conditions for nondictator strategy-proof mechanisms (e.g., see the overviews [19, 23, 74]).

Nowadays, the growing popularity belongs to the following approach. Possible losses from manipulation in common procedures of expert assessment aggregation are estimated by:

1. *the closeness of expertise results* in the cases when (a) experts perform manipulation and (b) experts adhere to truth-telling [66];
2. *the degree of manipulability* (the relative frequency of cases, where experts benefit from manipulation);
3. the maximal possible deviation due to *manipulation*.

For the time being, investigators have demonstrated that these losses are moderate for many mechanisms. Furthermore, in several cases experts loose more than gain by their strategic behavior. However, the following issue from implementability theory [49] remains open. Given a certain procedure enjoying optimality in the absence of manipulation, should one apply this procedure in the case of manipulation or construct another procedure? The answer exists only in special cases.

E-expertise adopts calculation mechanisms for the *reputation* of experts depending on the history of their participation in previous expertise. Here of crucial importance are the results on designing multicriterion strategy-proof mechanisms of active expertise [19]. Under some assumptions on experts' preferences, it is impossible to build strategy-proof mechanisms (i.e., each expert provides true information on each issue) such that the reputation of experts depends on voting history.

The above-mentioned research *par excellence* deals with models, where experts consider their personal interests. In this case, the effect of manipulation gets manifested in "hogging the cover," i.e., if an expert believes that the result of expertise would not coincide with a desired result, he reports *extremal assessments* (towards the desired result).

For e-expertise with reputation calculation based on the history of agents' participation in previous expertise, some researchers explore conform behavior, see [41]. Notably, they show that, in a series of cases, experts may strive for divining the final result of expertise and report it to improve their rating/reputation. It seems interesting to study models, where the strategy-proofness of mechanisms is guaranteed by counteracting two directions of manipulation–agents pursuing a certain result of expertise and agents maximizing their rating.

Expert manipulates the awareness of Principal. We believe that this case of manipulation is inadmissible; indeed, an expert directly influences a Principal only through information and communication channels used in expertise mechanisms. If an expert reports untrue information in response to Principal's queries, we obtain the type of manipulation described in case 8.

Expert influences other experts. A distinctive feature of e-expertise is that a Principal possesses limited capabilities to control the interaction of experts. Therefore, a topical direction of investigations concerns prevention methods for purposeful influence of certain experts on other experts. This type of manipulation attracts major interest in organization and conduct of e-expertise.

5.3 Experts Influence Experts

9. Expert manipulates the staff of experts. Under the above assumptions, we characterize this manipulation as an expert's influence on the process and result of decision-making of other agents (whether they participate in an expert group or not). Note that the capabilities of such manipulation are strongly limited. Really, if

this influence gets regulated by an expertise mechanism or has the motivational or informational character, it belongs to other types of manipulation (see below). By analogy to manipulation focused on the staff of experts and performed by an expert or a Principal, here feasible actions are decisions to participate in expertise or not to participate. In other words, an expert can decide to participate in expertise to engage or exclude other experts. The result of such influence and corresponding decision-making process admits formal description by models of conformity behavior, models of opinions' propagation in social networks or virus models [50].

Suppose that experts may coordinate their decisions on participation in expert groups. Then modeling and analysis of their behavior can employ certain theoretical results from staff formation problems in organizational systems with coalitions, network formation games [50]. However, the experts' decisions on collaboration based on these models, to a large degree, depend on current expertise mechanisms. Therefore, such collaboration actually represents manipulation of the procedures of expert messages' treatment, which is performed by experts (see case 11).

10. Expert manipulates the interests of other experts. In this case of manipulation, an expert influences the messages of other experts by offering certain incentives for their services, concessions (queries). This phenomenon can be viewed as the process of coalitions' formation (*collaboration, virtual collaboration*), where a manipulating expert engages other experts into a coalition through payoff reallocation among other members of the coalition. Such collaboration of purposeful subjects has been intensively studied in *theory of cooperative games* with transferable utility [87]. The results of these investigations can be applied (a) to analyze the conditions of coalitions' formation by experts, (b) to find expertise results convenient for coalitions and (c) to evaluate the payments of a manipulating agent to other members of a coalition. Interestingly, most publications in this field get focused on the following issue. When is the *maximal coalition* (i.e., the one uniting all experts) formed? Appreciably less attention is paid to coalitions composed of some agents [22].

There exist generalizations of the described results to the case of networked interaction in e-expertise problems. For instance, we refer to a detailed survey in [50]. Moreover, another thriving direction of theoretical research covers resource allocation problems on networks [51]; the solutions of these problems can be used to compute the payments of a manipulating expert to other experts engaged in a coalition (with proper consideration of the specifics of networked interaction).

Expert manipulates the set of feasible messages. Similarly to the case when an expert manipulates a Principal, we believe that an expert is almost unable to influence the set of feasible messages of other experts.

11. Expert manipulates the procedure of expert messages' treatment. Here we assume that an expert manipulates his personal request (see case 8) and tries to coordinate such manipulation with other experts (e.g., by "calling" them to distort their messages). In contrast to the situation discussed in case 10 (influence presupposes motivation), here the only tool of influence consists in communication among experts (to coordinate their positions). To model such interaction, it is possible to involve certain results from theory of cooperative games with *non-*

transferable utility [84]. This framework serves for studying possible factions in political science [12, 75], where the feasibility of coalitions' formation from several parties is analyzed via their influence indices [6].

Among approaches to prevent such manipulation, we mention research in the field of designing *coalition strategy-proof* mechanisms of decision-making [18, 60, 109]. Here an emphasis is made on the conditions when strategy-proof mechanisms simultaneously become coalition strategy-proof (i.e., any set of experts never improves expertise result by distorting their true requests in a coordinated way).

In the sense of e-expertise, we associate particular interest with game-theoretic models of network formation [11, 20], which can be interpreted as a generalization of theory of cooperative *games with non-transferable utility* for networked problems. These investigations yield new concepts of an equilibrium to describe the coalitions of experts appearing in the course of active e-expertise and to analyze the stability of these coalitions against destructive influences.

12. Expert manipulates the awareness of other experts. This type of manipulation can be treated as "bluffing," i.e., an expert deliberately deceives other experts on his capabilities or awareness used in decision-making. Due to intensive communication among participants of e-expertise and Principal's limited capabilities to control such communication, this type of manipulation becomes one of most "dangerous."

Any actions of a manipulating expert actually represent *informational control*. Hence, it is possible to identify three basic types as above (see informational manipulation of experts by a Principal). Nowadays, there are few publications studying models of informational control applied to an agent (a participant of a decision-making process) in order to influence other agents (e.g., see [78]). Particularly, this is the case for decision-making by cognitive and/or game-theoretic modeling. At the same time, many authors explore the impact of such phenomena from the viewpoint of psychology and other sciences. Therefore, in-depth analysis of this type of manipulation represents a most promising direction in theory of e-expertise.

This chapter has overviewed the existing models of active e-expertise and manipulation capabilities for e-expertise results.

The suggested classification of methods and objects of manipulation serves to structure many publications in this field and to choose appropriate strategy-proof mechanisms of e-expertise.

The results described above might and should be considered as a "dual-purpose weapon." They can be adopted to prevent manipulation (for a good cause) and to organize manipulation (for a bad cause) in e-expertise. However, it seems obvious that, even in conventional expertise, the problem of active participants has not still been completely solved. The specifics of e-expertise bring some types of manipulation in the forefront (e.g., informational manipulation of other experts by a given expert) and compensate other types of manipulation (in the first place, Principal's influence on experts).