

THE SYSTEM OF EARLY RECOGNITION OF CHANGES IN THE ENVIRONMENT IN THE OPINION OF SENIOR-LEVEL MANAGERS

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Abstract

The problem of early recognition systems is still insufficiently explored by researchers on the grounds of the management studies, and the overview of the literature of the subject reveals the scarcity of empirical papers which would attempt to identify and describe systems occurring in organizations. With regard to the above, it is necessary to intensify works in this area so that in subsequent research of the organizational phenomenon that early recognition is, it could be possible, on the one hand, to learn more about their structure and functioning in an organization, and on the other hand, to improve research instruments enabling their measurement. This paper's aim is to present the findings of the research attempting to identify the early recognition system with regard to its four aspects: the functional, the process, the instrumental and the structural one.

Keywords: *early recognition system, survey of enterprises, SME sector, opinions of senior-level managers.*

1. Introduction

The conditions of the environment of contemporary organizations, characterized by volatility and implying the uncertainty of decision-making situations, lead to a change in the role and the expected manner of the strategic management functioning. It requires new tools supporting information and decision-making processes in the area of planning and strategic control which would provide strategic information. The efficiency and effectiveness of strategic management and, what follows, an ability of an organization to survive and develop in the long run, are determined by the capability to recognize future opportunities and threats in advance. The conditions allot new tasks to management theoreticians and practitioners who should orient their activeness towards the description, building and improvement of Early Recognition of Changes in the Environment (ERS). The overview of the

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literature on the subject reveals the scarcity of empirical works which would attempt to describe the ERSs occurrence in organizations. The issue of early recognition is an area explored empirically to a minor extent and range, which, in consequence, has revealed the lack of measurement instruments that would enable researchers to examine this organizational phenomenon.

The aim of this article is to present the findings of the research which attempted to identify the early recognition system with regard to its four aspects: the functional, the process, the instrumental and the structural one.

2. The definition and the structure of the system of early recognition of changes in the environment

The early recognition system is a special kind of information system focused on the anticipation of changes occurring in the organization's environment and the reduction of uncertainty related to it, as well as on informing senior-level managers about them in such advance so that it could be possible to undertake adequate actions enabling them to avoid strategic surprises; the specific character of the system consists in orienting the processes of information processing towards the perception and interpretation of weak signals being the symptoms of changes, substantiated in the form of future opportunities or threats; the system is a tool supporting strategic management (the planning and strategic control systems functioning in organizations) in terms of information by providing information reducing uncertainty of decision-making situations and enabling to take decisions leading to better adjustment of the organization and the environment, and therefore guaranteeing the survival and development of the organization.

The system methodology (Sienkiewicz, 1988; Gharajedaghi, 1999) points out to four aspects of the systems requiring separate identification. In the area of the system static, it is the structural aspect (it orders the system defining its components and relationships among them), and in the area of the system dynamics these are the following aspects: the functional one (defines the results of the system operations, indicating the goals, functions and implemented tasks), the process one (defines the sequence of activities leading to the realization of its functions), the instrumental one (it identifies the key tools supporting the activities).

The basic aim of the ERS is the systematic provision of information concerning anticipated changes to senior-level managers, which may enable taking more rational decisions in the strategic management process. The goal is accomplished via the identification of long-term changes in the environment and the analysis of their impact on the organization early enough to secure the time necessary to take adequate decisions. In addition to the basic goal, related to the structural functioning of the formalized system, it is necessary to indicate

an additional goal which is connected with the creation and internationalization of a culture supporting and stimulating the commitment of entities to the information processes related to receiving and analyzing weak signals.

The goals defined above are realized by the functions which focus on three areas: the perception of weak signals (the diagnostic function), the interpretation of weak signals (the prognostic function), the flow of information and communication of future opportunities and threats (the information function).

Considering the fact that the ERS is in fact a specific kind of the organization's information system, the informative function should be considered the basic function, arising directly from the main goal. It is responsible for the implementation of the whole cycle of information management and it is to ensure the proper flow of information. The diagnostic function is another function, and it is related to the recognition of events in the environment with regard to the planned activities in the context of identifying the symptoms of future changes in the environment. It is implemented by unfocused observation of the environment in order to search for the symptoms of changes, as well as the observation focused on already collected information, aiming to particularize and acquire additional information in order to sharpen the semantic field of the signals accumulated before. The last function is the prognostic function which is connected with the projection of presumable or most probable future behavior or state of the objects in the environment which are considered important. It implements the tasks of the projection of the direction in which the environment will develop and change, the assessment of the influence of the described events on the situation of the organization and the identification of the main implications for the decision-making process.

Within ERS we can distinguish two phases constituting its process character: the first is related to the perception of weak signals and the other to their interpretation. We can divide them into five categories of activities. In the perception phase (obtaining information) it is scanning in search for weak signals and monitoring their evolution, and in the interpretation (processing) phase it is forecasting potential opportunities and threats and assessing their implications. The entirety is coupled by communication which creates an interactive system processing information inside and obtaining and passing information to the outside.

All the activities implemented within ERS require the use of tools supporting information processes. There are two basic categories of them: information technology and analytical methods. Information technology is to ensure an effective access to information valuable from the point of view of the goal of the system, as well as to improve communication serving the interpretation and dissemination of information. Analytical methods support the processes of systematizing, analyzing and interpreting information and

those are methods from the area of strategic analysis (such as scenario methods, Delphi analysis, war gaming, jigsaw method).

The structural aspect concerns relations which occur between the system elements and the way of linking them, as well as ordering the entirety expressed in an organizational solution within which activities are implemented. We can talk about two dimensions of structuring: universally understood elements fulfilling the system functions and their connections, regardless of the fact of the occurrence of formal structures, as well as solutions within organizational structures which are postulated and possible to be applied. The ERS components are: a detector which searches for and accumulates weak signals, processes them initially and passes the information regarded relevant; an assessor which checks the information received from the detector, processes it and correlates it so that it could be used to inform about potential opportunities/threats; an effector informs about potential opportunities/threats and initiates actions which are necessary to be implemented; communication networks constitute information links among the key elements with regard to the effectiveness of the whole system functioning, because they are responsible for the transmission of information (Bąk, 2011).

3. The research methodology

Studying the ERS is a difficult task since, as the existing works implemented in this area show², the ERS usually adopts the form of the system of informal activities which are not reflected in the organizational documentation (organizational statute, organizational chart, job analyses of individuals and organizational units, duties and responsibilities of positions) and constitute the practice of managers' activities. The tasks related to gathering strategic information can be dispersed in organizations on various levels and in various functional areas, and the weight of their interpretation concentrates on senior-level managers. Therefore, it is necessary to study the "symptoms" of the system and based on it conclude on the system itself. With this in mind, the perspective of familiarizing oneself with the opinions of senior-level managers concerning the issues related to the realization of the early recognition of changes in the environment in the organization they manage, was adopted in the research³.

The outlined research problems and the present research maturity in the area of the research into the ERS indicated the adoption of such a

² The research conducted by the Academy of Competitive Intelligence in the United States showed that formal early recognition systems occur marginally. In less than 3% of the studied firms totally formalized and systematic activities are conducted, in the next 63% only a few components of the system occur, and in more than one-third there are no formalized systemic solutions (Gilad, 2004)

³ Such an approach to study organizational phenomena is presented in the area of early recognition by, among others, Day & Schoemaker (2006), Kirshkamp (2006), Hough & White (2004).

research approach within which the ERS is treated as a latent variable and is a superior construct measured by means of a set of subordinate indicators being observable variables and describing this system in the structure of the organization's operations. The research tool based on the managers' opinion should indirectly enable drawing conclusions on the ERS aspects and was constructed in such a way that individual positions of the scales assessed the ERS constituents assuming that the more intense the actions are, the more intense the recognition and the more mature the ERS is, and, in consequence, the bigger the probability to recognize potential opportunities/threats is.

In the conducted empirical research⁴, which was of closed and categorized character, the adopted objective was an attempt to identify the ERS in the adopted research aspects. The survey population were organizations (of micro, small and medium-sized enterprises – 262 entities) which were distinguished in the ranking of most innovative enterprises in Poland – Kamerton Innowacyjności (Tuning-fork of Innovation). They implement product, as well as process, organizational or marketing innovations, and thus they are entities which, by identifying future changes in the environment (a weak signal), recognize in advance potential opportunities and threats related to it (the early recognition system) and use them, changing in this way (in terms of product, process, organization or marketing) to use them (opportunities) or eliminate them (threats). The choice of such a research frame was dictated by the author's conviction, confirmed in the literature (Christensen & Anthony, 2004), that innovative organizations handle the recognition of changes better, therefore, they have to have ERSs “installed” and developed. In the effect of the efforts related to reaching respondents effectively, 65 surveys were conducted – 25% of the adopted population (micro-enterprises – 18%, small enterprises – 36% and medium-sized enterprises – 21%).

Considering the non-formalized character of the system and quite often unaware actions contributing to early recognition, the research instrument was built of such scales of measurement which, on the basis of the respondents' opinions, will identify the ERS. The measurement tool in the survey was a structured, closed survey questionnaire and a telephone interview was the data collection technique. The interviews were conducted with senior-level managers⁵ who are involved in strategic management, and thus in the ERS functioning, and at the same time are the recipients of the “products” of this system”. The questionnaire was built of statements being the scale positions constituting the indicators of various aspects of the system. While constructing it, the limitations arising from the adopted measurement technique, as well as

4 The survey was conducted at the turn of the years 2010/2011.

5 In micro and small enterprises, in most cases those were actively managing owners of firms, in medium-sized enterprises those were members of top management, at least directors.

the complex character of the research subject were considered. With the above in mind, the measurement tool had to be maximally transparent, so that it could facilitate the communication between the respondent and the researcher in the situation when the respondent had no access to the measurement instrument. The measurement consisted in reading individual statements to the respondents, which they assessed by means of a 7-point Likert agreement scale (Burns & Bush, 2000, p. 318): 1 - strongly disagree, 2 – disagree, 3 – somewhat disagree, 4 – neither agree or disagree, 5 – somewhat agree, 6 – agree, 7 – strongly agree)⁶.

4. Identification of aspects of the early recognition system

When identifying the early recognition system in the research aspects regarded important, namely the functional one, the process one, the instrumental one and the structural one, an attempt was made to show that early recognition systems are “installed” and used for the needs of strategic management, and it is possible to identify in organizations the individual aspects of the system: the functional, process, instrumental, structural one. Not being mature and fully developed, early recognition systems take the form of non-formalized systems, and very often they are unaware. It leads to the lack of commitment of the whole organization and basing the system functioning on actions taken by managers for whom it is the practice of everyday work for the organization. Organizational documents *explicite* do not reveal the occurrence of the systems in organizations, it is not possible to find units or positions responsible for them, procedures describing the actions, dedicated tools or resources allocated in the budget. In spite of this, the managers’ opinions enable to identify the system and on that basis to conclude whether the actions related to the early recognition of potential opportunities and threats are implemented in organizations.

The functional aspect

It defines the results of the system operation, indicating aims, functions and tasks it implements. In this sense, the ERS should recognize potential opportunities and threats in advance and support strategic management. The aim is accomplished via the realization of the following functions: the diagnostic one (perception of weak signals), the prognostic one (interpretation of weak signals) and informative one (processing of information), substantiated with detailed tasks.

In the surveyed organizations the managers express their opinion (Figure 1) that they recognize potential opportunities and threats early enough. 86% of

⁶ The justification for choosing a Likert-type scale is basing the research found in the literature on the aforementioned scale, and for the adoption of the 7-item scale was the respondents’ preference for uneven scales. (Kirschkamp, 2000, p. 87).

the respondents claim that they implement the main goal of the ERS functioning expressed in obtaining information conveyed by weak signals in advance.

The average rating of the capability of early recognition of potential opportunities and threats is on the level of 5.54 (on the 7-item scale) with a standard deviation of 1.071 and a median of 5.50.

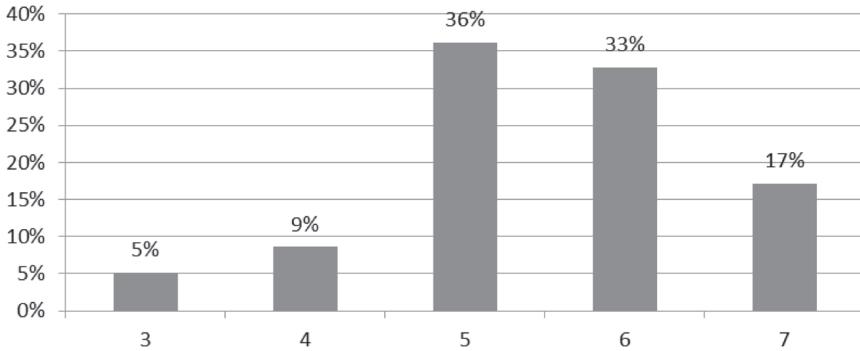


Figure 1. A capability of early recognition of potential opportunities and threats⁷
Source: own study based on the survey results

In the managers' opinion, the results of the early recognition system functioning are useful, therefore, they are intensely used by them in strategic management to modify long-term plans (strategies). 97% of the respondents declare (Figure 2) the use of this information. The average rating of the intensity of the use of this information is at the level of 5.93 (on the 7-item scale), with a standard deviation of 0.997 and a median of 6.00.

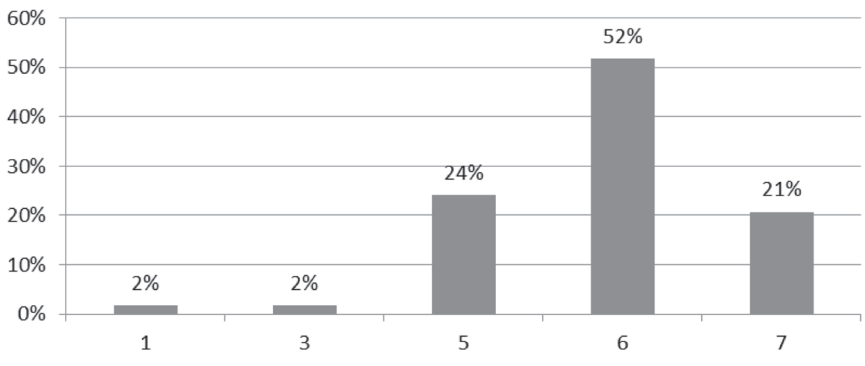


Figure 2. Intensity of the use of potential opportunities and threats for the modification of long-term plans⁸

Source: own study based on the survey results

⁷ Position of the scale: We manage to recognize potential opportunities and threats significant for the *Organization* early enough.

⁸ Position of the scale: We use recognized potential opportunities and threats in *the Organization* to modify long-term plans.

The above identification of the functional aspect enables to assert that the surveyed organizations achieve the aim of the early recognition system functioning manifested in the early recognition of potential opportunities/threats and their use in the strategic management of the organization.

The process aspect

It is substantiated with activities leading to the implementation of the functions mentioned before. The activities are related to the perception and interpretation of weak signals and have been defined as scanning, monitoring, forecasting, assessing, and communication which couples them.

The surveyed organizations, in the respondents’ opinion, implement the activities related to the perception of weak signals, manifested, for example, in obtaining information about potential opportunities and threats with various frequency from various sources.

87% of the respondents declare (Figure 3) that they obtain information about potential opportunities and threats from external – personal sources (customers, suppliers, consultants, etc.). The average rating of the frequency of scanning of those sources has the level of 5.84 (on the 7-item scale) with a standard deviation of 1.441 and a median of 6.00.

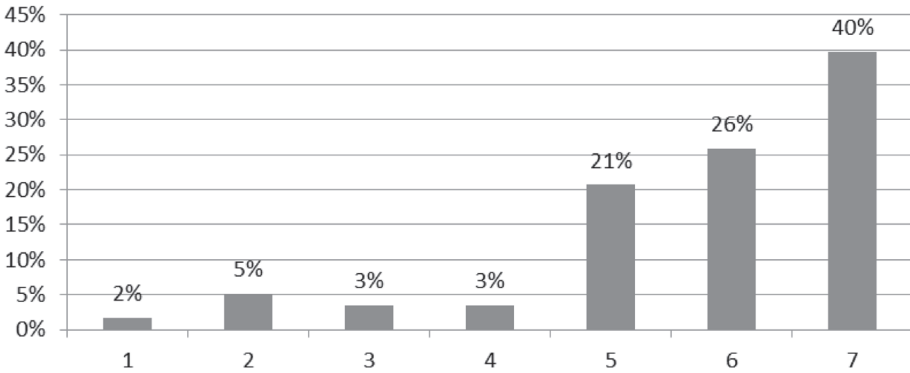


Figure 3. The frequency of the perception of weak signals – external – non-personal sources⁹

Source: own study based on the survey results

87% of the respondents also declare (Figure 4) that the sources of this information are external – non-personal (the Internet, periodicals, external data bases, etc.). The average rating of the frequency of scanning of those

⁹ Position of the scale: Customers, suppliers, contractors, external consultants, etc. are very often a source of information useful to recognize potential opportunities and threats.

sources is at the level of 5.99 (on the 7-item scale) with a standard deviation of 1.228 and a median of 6.00.

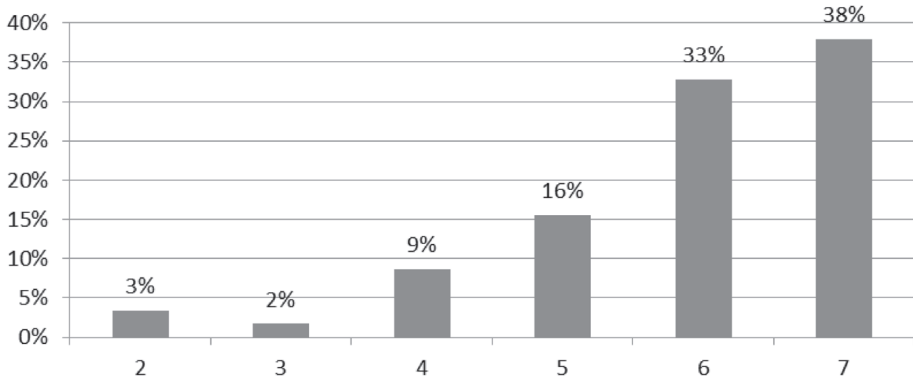


Figure 4. The frequency of the perception of weak signals – external – non-personal sources¹⁰

Source: own study based on the survey results

In the area of the interpretation of weak signals, managers declare the implementation of activities related to that, manifested, for example, in conducted discussions on potential opportunities and threats.

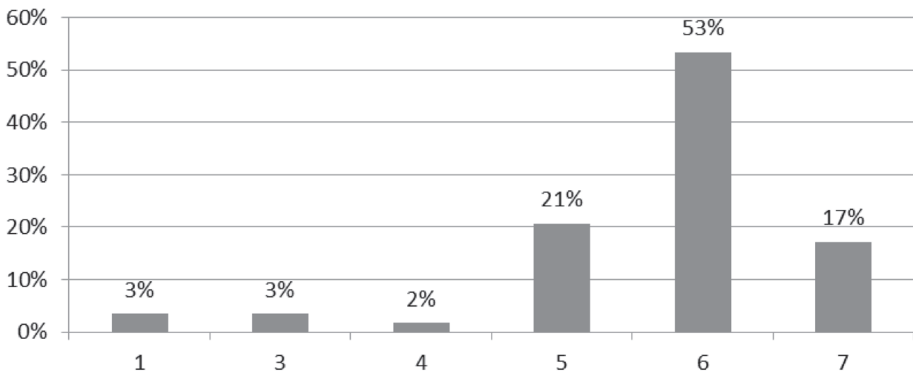


Figure 5. The intensity of interpreting weak signals with entities inside the organization¹¹

Source: own study based on the survey results

10 Position of the scale: Periodicals (including trade journals), the Internet, external databases are very often a source of information useful to recognize potential opportunities and threats.

11 Position of the scale: We intensely discuss potential opportunities and threats inside the Organization.

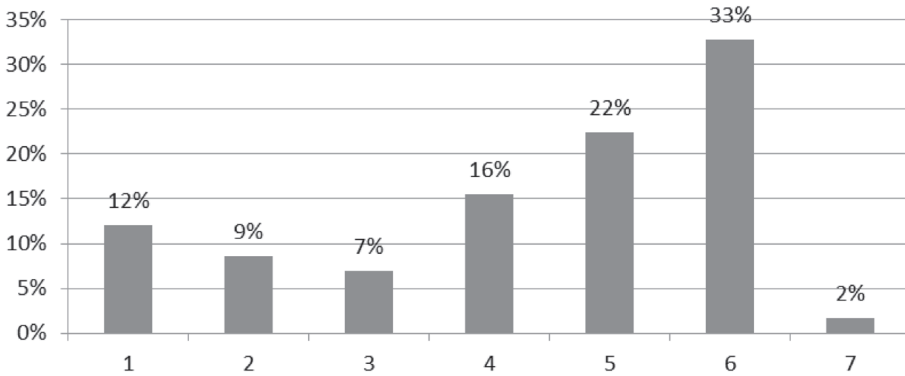


Figure 6. The intensity of the interpreting weak signals with entities from the outside of the organization¹²

Source: own study based on the survey results

91% of the respondents declare (Figure 5) that within the organization intense talks concerning potential opportunities and threats are conducted. The average rating of the intensity of those talks is at the level of 5.75 (on the 7-item scale) with a standard deviation of 1.226 and a median of 6.00.

On the other hand, 57% of the respondents declare (Figure 6) that intense talks concerning opportunities and threats are conducted with people from the outside of the organization. The average rating of those discussions has the level of 4.41 (on the 7-item scale) with a standard deviation of 1.885 and a median of 5.00. The above identification of the process aspect shows that in the managers' declarations, organizations implement processes related to the perception and interpretation of weak signals.

The instrumental aspect

It becomes substantiated with instruments supporting the implementation of the system tasks in the form of analytical methods of IT information and communication tools. Taking into consideration the fact that information processes are implemented within the system, organizations have to apply varied analytical methods enabling the synthesis of the received information. At the same time, they significantly extend the possibilities to access relevant information about the environment supplying the analytical processes, owing to an easier access to information with the use of various IT information and communication tools. In the organization there are both the mentioned IT tools and analytical methods.

¹² Position of the scale: We intensely discuss potential opportunities and threats with people from the outside of the Organization.

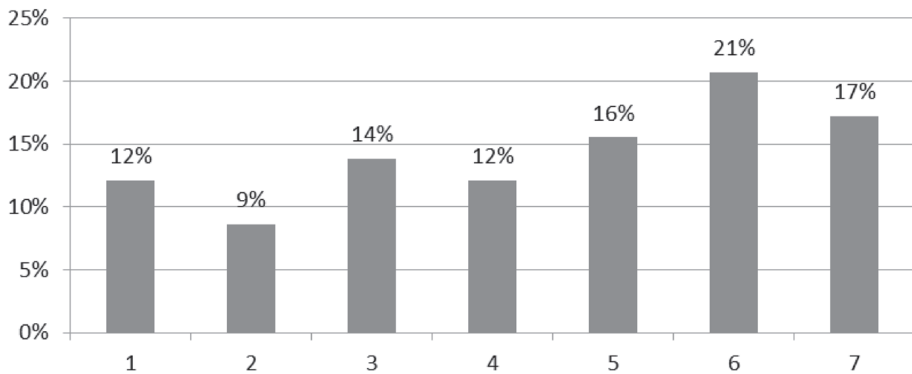


Figure 7. Tools in the ERS¹³

Source: own study based on the survey results

The obtained survey results reveal that in the surveyed organization varied tools supporting the ERS are applied, but the intensity of their use is different. More than a half (54%) of the surveyed managers declare (Figure 7) that in the organizations they manage the tools are applied with a various level of intensity. At the same time, one in three respondents (34%) declares that the support of tools in the process of recognizing potential opportunities and threats is insignificant (or none). The average rating in this area is 4.38 (on the 7-item scale), with a standard deviation of 2.03 and a median of 5.00.

The above identification of the use of tools within the system shows that instruments supporting the system are used in organizations to various extent and range. However, in spite of a relatively easy and cheap access to IT information and communication tools and the managers' knowledge about different analytical methods, they do not apply them sufficiently and treat them more like "gadgets" rather than a normal operational work tool supporting tasks within the early recognition system.

The structural aspect

It is expressed in the relations occurring among individual elements of the system and the manner of linking them. In addition, it is manifested in the formalization of the system within the organizational structure, showing to what extent aims, tasks, assigned responsibilities and allocated budgets are formally defined.

In the surveyed organizations, employees are involved in the system functioning to a small extent. Only in one in three organizations (31%), the

¹³ Position of the scale: Analysis of information about potential opportunities and threats in *the Organization* is very intensely supported by analytical tools (scenario, war gaming, etc.) and IT information and communication tools (blogs, instant messengers, information management systems, etc.).

level of delegating tasks related to obtaining weak signals can be regarded intense (Figure 8), but in over a half (56%), the responsibility for those tasks is concentrated on individuals (usually on senior-level managers). The average rating in this area is 3.43 (for the 7-item scale), with a standard deviation of 1.887 and a median of 3.00.

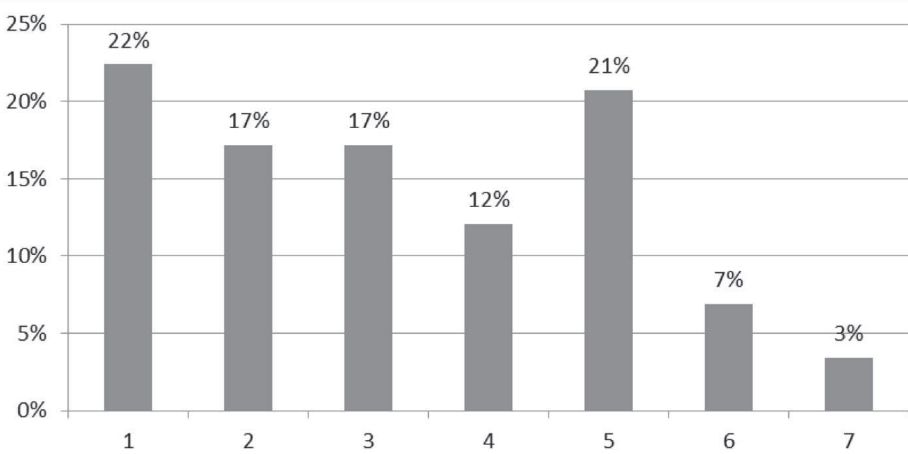


Figure 8. Delegation of tasks in the ERS¹⁴

Source: own study based on the survey results

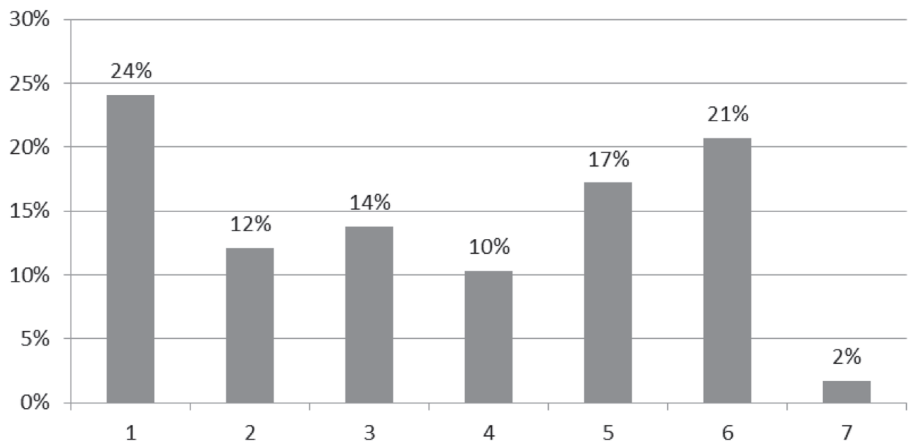


Figure 9. Level of the ERS formalization¹⁵

Source: own study based on the survey results

¹⁴ Position of the scale: All employees in *the Organization* are responsible for searching for information about potential opportunities and threats.

¹⁵ Position of the scale: In *the Organization*, obtaining and analyzing information about potential opportunities and threats is totally formalized (tasks, budgets, responsibilities).

In every second firm (Figure 9), managers assess the system as non-formalized, and only one organization declares full formalization of the system. The average rating of the level of formalization is 3.59 (for the 7-item scale), with a standard deviation of 2.039 and a median of 3.5.

The above identification of the structural aspect, based on the managers' declarations, enables to assert that early recognition systems in the surveyed organizations are formalized to a small extent, and in addition, the postulated structure manifested in the commitment to obtain information by the possibly biggest number of employees is not used sufficiently.

5. Conclusion

The conducted research process and the obtained results enable to identify the system in the organization's activity structure, and on that basis they enable to conclude that activities related to early recognition of potential opportunities and threats are implemented in the organizations. Basing on the conducted survey we can conclude that in the surveyed organizations non-formalized early recognition systems occur, mainly based on the activities taken by senior-level managers who, while implementing strategic management, undertake an attempt of early recognition of changes in the environment. In the organizations we can identify, to various extent, all important research aspects of the system (the functional, the process, the instrumental and the structural one), and this picture is a kind of the organization's profile with regard to the recognition of potential opportunities and threats, that shows systems which are advanced in some areas and significantly deficient in others.

Simultaneously, we must be aware of the constraints to the reasoning, arising from the basic shortcoming which is the size of the sample obtained as a result of the conducted interviews. Thus, the survey cannot be the base for the generalization of the results, but it is important contribution to the recognition of this problem area on the grounds of management studies, considering the lack of (quantitative) research within this scope. Moreover, the adopted survey technique – telephone interview and related measurement tool – imposed certain quantitative and qualitative limitations on the data gathering process. The adopted duration of an interview and indirect communication (with the use of the communication medium which the telephone was) required to construct an unsophisticated questionnaire to improve the effectiveness of collecting data and their reliability. The effect of those actions is inevitable simplification of the perspective and closing a whole variety of possible formulations in one category system. Direct contact of the researcher with the respondents would enable deepening or clarifying the respondents' utterances. The obtained results are a starting point for further, mainly empirical research works related

to the improvement of measurement tools and further exploration of the ERS problems.

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