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THE MOST IMPORTANT STAGES OF INNOVATIVE MANAGEMENT OF THE FUTURE IN THE FORESIGHT APPROACH

Key words

Foresight, stages of future studies, progressive management, innovation.

Summary

This publication presents a synthetic approach as well as recommendations related to the main stages of foresight studies as one of the most important approaches in the process of creating innovative development visions of various fields (technological, regional, brand, etc.). The results presented in this publication are based on a detailed study of subject specific literature and the author's experience gained from his active participation in numerous foresight endeavors, including as a co-author of the research methodology of one of the projects.

Introduction

In our current surroundings, which are dynamic, complex and subject to unforeseen events, consideration of the future should become one of the more important values of every organization (seen as a part of social, economic, legal, political, socio-cultural, biological, technological, and institutional environment) and should have an influence on the actual shaping of the future and on current decisions. For a long time, contemplation of the future has been a subject

of research for people who specialize in the theoretical and practical aspects of management [8].

Individuals as well as complex organizations (economic, territorial, social, etc.) must be aware of the effects of potential changes and remain open to a reality which is internally (personnel) and externally (ex. socially) complex [6]. Foresight is one of the most popular instruments for the planning and progressive management of changes, on both the global and local levels, for establishing common (a result of network cooperation between representatives of various social groups) visions, strategies and long-term plans at both the governmental and the single business levels. The set of instruments, research methods, networks of cooperation and know-how utilized in foresight, all create, in a manner of speaking, a bridge between current activities (for example business activities) and an uncertain, but desired, future [7].

A definition which is very useful in the context of innovative management has been formulated by R. Slaughter, who defines foresight as the universal human capacity which allows people to think ahead, model, create and respond to future eventualities. It is based on a rich, integrated, and complex thinking system and supports human perception [6].

Foresight has many definitions, paradigms, foundations, which, presumably, make it one of the most important research approaches in management, influencing the creation of a new field of study: *future management*. Despite so many research foundations, foresight is constantly evolving and, as a result, requires continual improvement. One of these areas is the area addressing the stages of research that, according to the author, because of its numerous approaches, requires clear codification that will make the research process of foresight easier. This type of synthetic approach, based on the analysis of literature as well as on the experience of the author, has been presented in this publication.

1. Main stages of foresight studies according to various authors

Several approaches of individual stages of future studies have been described in literature dealing with this subject.

In the main approach, according to P. Bishop, A. Hines, T. Collins [1] and T. Mack [9], the process of foresight consists of 6 stages (Table 1). Generally, every stage generates a particular product. The aggregate of all results of every stage influences the ultimate solution of the problem being studied.

Stage 1, *framing*, is based on a clear definition of the research framework and of aims, as well as our own expectations regarding the results of the project. On this level, the following questions should be posed: (1) Who are the recipients of the project? (2) Why are we taking part in the project? (3) What kind of information do we want to obtain from the considered process. Stage 2, *scanning*, consists of a systematic analysis of information from available media

and other sources to discover essential trends and changes within the environment which may influence the future being studied [9]. Stage 3, *forecasting*, can be called the „what if?” phase. Based on the knowledge gathered in the previous stage, alternative development futures of the considered research area are formulated with the presumption that they will be similar to the past.

Table 1. Stages of the foresight process – general approach

STAGE	DESCRIPTION	FINAL PRODUCT
<i>FRAMING</i>	Defining the scope of the project including such issues as the potential recipients of results, working environment, research justification, research areas, project aims and executive team	Project plan
<i>SCANNING</i>	Gathering of information concerning the system, history and context of the research problem	Information
<i>FORECASTING</i>	Description of primary and alternative futures: driving forces, unknown factors and their implications and results	Scenarios
<i>VISIONING</i>	Selection of a preferred future: representation of best results, selection of goals, milestones and achievements	Preferred future
<i>PLANNING</i>	Organization/selection of essential assets: strategies, operating options, plans	Strategy
<i>ACTING</i>	Plan execution: reporting results, preparation of operating and institutionalization plans as well as strategic thinking	Operation plan

Source: [1].

Stage 4, *visioning*, should be based on the creation of a development vision of the area being studied, based on realities but also on sometimes exaggerated future hopes, dreams and aspirations. Stage 5, *planning*, becomes a bridge between the vision created in the previous stage and the final *acting* stage. We should make certain that the organization being studied is prepared for the implementation of the numerous options of strategy in the context of managing an uncertain future and, based on this, make a conscious decision regarding the direction of our activity. In the last stage of our foresight study – *acting* – the following issues corresponding to the previous stage should be addressed: What should be done to realize the plan that has been created? Who is responsible for its execution? How and when should it be done? [9].

B. Habbegger [5] in turn identifies three phases of strategic foresight: *early detection of information, generating foresight knowledge and developing policy options* (Table 2).

The identification of small signals (through careful observation of the environment) which could be indicative of big changes in the future should occur in *Phase 1*. This should allow us to understand how the organization being studied and its surroundings function, what kind of processes and relationships exist between them, who are the main players, and what are their aims and expectations. *Phase 2* considers the interpretation of the influence of various possible futures on the organization being considered. Individual problems, which may become more significant in the future, chosen based on select criteria, are analyzed in detail, especially in the context of the current activity [5].

Table 2. Phases of strategic foresight according to B. Habegger

Phase	Early Detection of Information (phase 1)	Generating Foresight Knowledge (phase 2)	Developing Policy Options (phase 3)
Description	Identification and Monitoring of Issues, Trends, Developments, and Changes	Assessment and Understanding of Policy Challenges	Envisioning Desired Futures and Policy Action
Value Chain	Information	Knowledge	Insights
Policy tool	Horizon Scans	Futures Projects	Scenarios

Source: [5].

In *Phase 3*, alternative scenarios are considered which may be possible (based on researchers' imagining of the future), plausible (having a justified probability of occurring according to the actual general knowledge and understanding of the workings of the world), probable (relying on the exploration of the past and the present through the future) or desired (using subjective judgments of individual experts and the expectations of larger groups of people and organizations and based on existing knowledge) [5]. Sample foresight initiatives, institutions, using this approach are The Netherlands Horizon Scanning Project; Singapore's Risk Assessment and Horizon Scanning (RAHS) and The UK Horizon Scanning Centre [5].

O. Saritas, S. Elena, K. Pook, C. Warden identified 5 research stages of systemic foresight (Table 3).

Table 3. Stages of systemic foresight

STAGE	DESCRIPTION
<i>UNDERSTANDING</i>	Establishing a level of understanding of the issues being studied by all parties interested
<i>SYNTHESIS & MODEL</i>	Synthesis of the results of the scanning process in order to create models reflecting the reality being studied
<i>ANALYSIS & SELECTION</i>	Analysis, prioritizing and selection of alternative models of the future through negotiations with interested parties
<i>TRANSFORMATION</i>	Defining the relationship between the future and the present in order to structure a program of changes
<i>ACTION</i>	Creation of information plans for current decision-makers in order to introduce fast-acting structural and transformational changes

Source: [15].

Recognition of the full picture of the issues studied, the factors affecting it, and especially the expectations of social actors and the explanation of the aims of research activities should be gained during the *understanding* stage. In the *synthesis & model* stage, based on the results of the previous stage, occurs the modeling of selected systems, independent of systems that may already exist. Preliminary scenario models are also created at this level. The third phase – *analysis & selection* – focuses on the construction of the most desirable models discovered in the preceding stage. The methods applied in this phase should help in the selection of the desired future system, removing or integrating the selected issues represented by various parties and research participants. The next stage, *transformation*, defines the most desirable future and helps in the selection of essential structural and behavioral changes for the considered system. The last phase – *action* – with the help of key technologies, list of priorities, operational planning and income estimates, should affect immediate changes to current decisions and activities within existing systems [15]. This methodology was used in the process of the strategic management of intangible and legal factors in Higher Education and Research Organisations (Hero) in the UK [15].

One of the most popular models of the stages of foresight has been presented by I. Miles [11] and further developed by R. Popper [14] (Table 4). This process consists of 5 complex stages.

Table 4. Phases of the foresight process according to I. Miles and R. Popper

STAGES	DESCRIPTION
<i>PRE-FORESIGHT</i>	Scanning and understanding of main factors of scientific and technological development, trends and issues being studied
<i>RECRUITMENT</i>	Mobilizing and engaging of key stakeholders
<i>GENERATION</i>	Generation of new knowledge through exploration, analysis and anticipation of possible futures
<i>ACTION</i>	Shaping of the future through strategic planning
<i>RENEWAL</i>	Evaluation

Source: own design based on [13, 14].

In Stage 1, (*pre-foresight*) initial strategic decisions, and decisions concerning the foresight process itself are formulated by foresight practitioners and sponsors. Strategic decisions are connected to the general aspirations of the project, meaning the justification of research or research aims, which includes the general and detailed, action plan within the framework of the project and anticipated results. The decisions regarding the project itself are especially concerned with research methodology, research context and development, and sources of financing for the research assets. The next stage, *recruitment*, which is in fact realized throughout the entire project is connected with the process of recruiting (and preliminary work of) specialists and stakeholders for foresight studies, who should supply knowledge for the study, including not only public knowledge, but also knowledge which is not commonly available. The third phase (*generation*) is the main stage of the process. Prospective knowledge and the developmental vision within the given research field is generated. Coded knowledge is decrypted, analyzed, and synthesized. Hidden knowledge is obtained from the experts and confronted with openly available knowledge, while new knowledge in the form of developmental vision and illustrations of the future should become one of the main results of this stage. The general phase consists of three basic stages: exploration, analysis, and anticipation. The subsequent *action* stage relies on the conversion of the results of the previous phase into real political and business action. The foresight process should be combined with traditional strategic planning in order to define realistic medium and long-term plans. The *renewal* – phase consists of obtaining knowledge about prospects and dangers connected to the final results of the project, including the foresight process itself. This stage requires the use of both evaluative and traditional social research methods [13, 14]. This methodology is the result of years of research by the team of Manchester Institute of Innovation Research of the University of Manchester. The proposed process is a derivative of foresight, various outputs of the EFMN monitoring activities, and the initiative carried out in Spanish by the SELF-RULE network [13].

2. The synthetic approach

The analysis of stages assigned to the foresight process by various authors made it possible to discover a common ground that is the basis for the synthetic model of the research stages of foresight (Figure 1). The stage creation process proposed by I. Miles and R. Popper became the main basis, because it remains one of the most detailed models and the one that is most often quoted in foresight literature. Other models, along with the author's experience, served as supplements. It should be emphasized that the primary goal of building a new complex model was an attempt to use the systemic (holistic) approach in the process of establishing the directions of development, with particular emphasis on the realm of science. Due to the complex and dynamic nature of current reality, this approach seems to be inherent in [4]. The new model fully fits into the scientific functions – analyzed for example by L.J. Krzyżanowski – which could be presented as the following stages of research process [8]: analysis and description; explanation and anticipation; creative synthesis; and, applications. Research activity of subsequent steps of the research process within the scope of applied methods is directed toward the research aims of the next stage.

The following research stages of the foresight process have been established in the synthetic approach: *preliminary, scanning, recruitment, main, planning, acting, evaluative, and resuming*.

The *preliminary stage* is connected with choosing of factors influencing the research methodology of foresight. It is possible to employ methods that are used to conduct framework research consisting of information gathering about the system being analyzed, its history, and the context of the considered problem. *Scanning*, which is the second stage, is described by T. Mack [9] as the systematic process of identifying and analyzing significant trends and changes occurring in time that can have an influence on the future of the object being studied. During the third stage, *recruitment*, the selection of key experts and stakeholders occurs. Additionally, existing (and newly created) networks of connections between people taking part in the project are analyzed and utilized. The next stage is the *main* stage and should facilitate the identification and analysis of the most important issues, trends, and driving forces. The methods of this stage are most often based on forecasts and/or the creation of a development vision of the field being studied. Exploration of existing knowledge, hidden knowledge, and the creation of completely new knowledge occurs at this stage. Anticipation of the desired future also happens at this point. Codified results occurring as alternative scenarios, lists of priorities and key technologies should be the formal effect of this stage. Questions related to „What if..?” and „If this happens then...” should be answered.

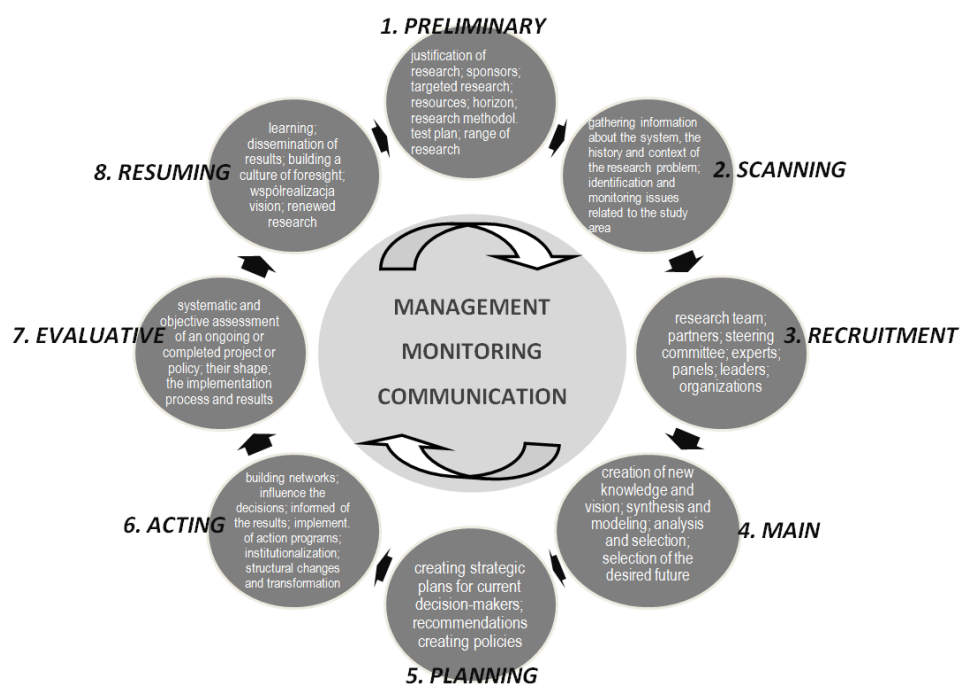


Fig. 1. Research stages of the foresight process – synthetic approach

Source: Own design based on [1, 5, 12, 14, 14].

All possible options, strategies, and plans of actions should be developed during the *planning* phase so that the best possible directions of activity based on the results of the previous stage can be chosen [9]. The sixth phase of research is the *acting* stage. In order to achieve all of the desired aims of the project, the implementation of the action plan occurs during this stage. The success of this phase is dependent on the level of engagement of all key players (politicians, scientists, entrepreneurs) and on the realization of the new policy of activity creating the future. The subsequent step is the *evaluation* stage whose aim, according to J. Nazarko [12], is the verification of the level to which the post-foresight activities fulfill the assumptions of the project, how effective, efficient, and productive the implementation of the newly applied policy (ex. innovation) has been, and whether its results are lasting. The following aspects of the foresight project can be evaluated: the manner in which the project was planned, the engagement of the people involved, the way the research has been conducted, pertinence, the level of goal completion, the applicability of the results, the power to influence, responsibility, learning, and added behavioral value. The *resuming* stage consists of, as the name implies, resuming (extending) the study, mainly based on the evaluation results of the entire research process, despite an interruption which may have lasted several years. This phase should occur

sometime (usually after a few years) after the project has been completed. The probability and risk levels of the results and of the foresight process itself should be evaluated, and approximation methods should be utilized, especially when it comes to social behaviors and opinions.

Table 5. Potential for use of individual classes of methods in each phase of foresight research

		FORESIGHT STAGES							
		PRE	SCN	REC	MAN	PLN	ACG	EVL	RES
CLASSES OF METHODS	CONSULTATIVE	low	low	low	high	low	low	low	low
	CREATIVE	low	low	low	low	low	low	low	low
	PRESCRIPTIVE	low	low	low	low	low	low	low	low
	MULTICRITERIAL	low	low	low	low	low	low	low	low
	RADAR	low	high	low	low	low	low	low	low
	SIMULATION	low	low	low	low	low	low	low	low
	DIAGNOSTIC	low	low	low	low	low	low	high	low
	ANALYTICAL	low	high	low	low	low	low	low	low
	SURVEY	low	low	low	low	low	low	low	high
	STRATEGIC	low	low	low	low	low	high	low	low

Power relations between classes and stages:
 low
 medium
 high
 very high

Foresight stages:
PRE – PRELIMINARY SCN – SCANNING REC – RECRUITMENT MAN – MAIN
PLN – PLANNING ACG – ACTING EVL – EVALUATIVE RES – RESUMING

Source: own design based on [10, 14].

Foresight methods can and should be used during various phases of the research process. Referring to studies conducted by R. Popper [14] (who presented a subjective analysis of the usefulness of all 33 methods in every one of the five stages of the foresight process), Table 5 presents the potential uses (using a weighted average) of every class (as a set of the methods described) in each of the eight foresight stages in the context of the author's classification, described in the article titled: A. Magruk, *Innovative classification of technology foresight methods* [10].

During the *preliminary* stage, the greatest usefulness is exhibited by methods belonging to the consultative and survey class. The *scanning* phase has the strongest connection to radar, survey, and analytical classes and is weakly connected to the creative and simulation classes. In the *recruitment* stage, the strongest potential for use is demonstrated by methods belonging to the consultative class. The remaining classes, with the exception of the simulation class (which has the lowest potential), have average potential for use. A slightly weaker, but still relatively strong, connection is exhibited by all of the remaining classes, with the exception of the radar class, which shows an average potential. The *acting* phase is very strongly connected only with the strategic class, and least strongly connected with the radar and survey classes. The *evaluative* phase exhibits the strongest connection with the methods of the diagnostic class and has a slightly weaker connection with the consultative class. The last phase – *resuming* – is very strongly connected to the survey class. The remaining classes are characterized by average or low usefulness.

Conclusions

When referring to the research of L.J. Krzyżanowski regarding scientific functions [8] the first phase, *analysis and description* (the diagnostic function, which delivers information regarding the „current state” of the considered area of reality, is implemented during this stage), within the synthetic model presented by the author, corresponds to stages: *preliminary, scanning, recruitment*. The second phase, *explanation and anticipation* (analysis of the relationship between features of objects, processes, events; attempt to alter reality thanks to implementation of the scientific functions during this stage: explanatory and prognostic), matches the *main* stage. Phase three, *creative synthesis* (relating to the results of individual methods and the way they complement each other), correlates to the *planning* stage. Phase four, *applications* (applying the results of the research into practical applications), corresponds to the *acting* stage. The last two stages, *evaluative and resuming*, which are not always present in other fields of science, are characteristic to foresight. It should also be mentioned that they are not always applied in foresight, although they should be. The author of this article expands the opinion of L.J. Krzyżanowski that states that the methods' complementarity aspect should be considered during the three stages of the research process, which would fulfill such scientific requirements as precision, cohesion, generality, simplicity, and fruitfulness [8]. According to the author, the condition of method complementarity should be observed at every stage of the research process because of the complexity of foresight problems.

Most foresight projects in Poland have been completed and are theoretically awaiting the *resuming* stage. It therefore seems significant to complete the evaluative activities proposed in the synthetic approach.

Additionally, in accordance to the author, in the context of the stages of the research process creation of the future in a systematic (holistic) manner, an approach undertaken by O. Markley [2] can be an interesting but very difficult notion. Furthermore, it is believed that the system theory will become gradually more significant within the field of future studies [3].

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Najważniejsze etapy innowacyjnego zarządzania przyszłością w ujęciu foresightowym

Słowa kluczowe

Foresight, etapy badań przyszłości, zarządzanie perspektywiczne, innowacja.

Streszczenie

Publikacja prezentuje syntetyczne ujęcie oraz rekomendacje dotyczące głównych etapów badań foresightowych jako jednych z najważniejszych podejść w procesie kreowania innowacyjnej wizji rozwojowej różnych obszarów (technologicznych, regionalnych, branżowych etc.). Wyniki zaprezentowane w publikacji oparte są na szczegółowej literaturze przedmiotu oraz doświadczeniu autora wynikającego z jego czynnego udziału w kilkunastu przedsięwzięciach foresightowych, również w charakterze współautora metodyki badawczej jednego z projektów.