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Anticipating and Managing Change in Large Organization Strategic Environment: Using Foresight and Organizational Policy to Enable Futures Literate Decision-Making

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Introduction

One of the key values of foresight is to enable organizations to anticipate the future faster, which, ideally, could be linked to tangible outcomes, such as new products, new services, new research paths, and new research projects, all leading to scientific discoveries and to new markets (Boe-Lillegraven and Monterde 2015; Rohrbeck 2010; De Toni et al. 2015; Hiltunen 2013; Grim 2009; Daheim and Uerz 2008; Burmeister et al. 2004; Becker 2003). However, as much as quantifiable value contributions matter for an organization's bottom line, it is institutional learning and culture, related to use of foresight, that may radically reinforce (or weaken) the positive impact of any forward-looking

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undertaking in the long term (Bootz 2010; Cunha et al. 2006; Van der Heijden 2004; Kononiuk and Sacio-Szymańska 2015).

The authors aim to illustrate the above hypothesis by analyzing the context, methodology, outcomes, and implications of foresight processes implemented in two organizational settings: a large private company (case A) and that of a public research institute (case B). The main characteristics of the two case studies are given in Table 7.1.

Case A: BEWA—Manufacturer of Beverages

Case study A describes the process of development and implementation of the innovative foresight tool supporting strategic management in BEWA, a beverage company (Bednarczyk 2016). BEWA is a large company. It employs 275 workers and has been developing rapidly thanks to the innovative market and marketing strategy implemented by the open-minded executive and middle management. Despite rather limited awareness of the brand among customers, BEWA company is one of the largest domestic producers of spring water, mineral water, and beverages in Poland. It is the supplier of water, beverages, and 100% not-from-concentrate (NFC) juice to the largest retail chain in Poland—JMP (Biedronka) and Eurocash, Kaufland, Carrefour, Selgros to name just a few. The company is characterized by rapid growth in sales (volumes sold 2009–2015 multiplied by 6) and exports (sale of approximately 300 mio of bottles per year).

In the early months of 2015, the company's management decided to revise the company's strategy in order to support their medium term-oriented investment decisions. The study aimed to develop (1) a database, and (2) a managerial presentation supporting the identification and monitoring of upcoming opportunities and threats present in the fast-moving-consumer-goods (FMCG) sector, as well as, questioning assumptions through the simulation of possible changes. The project was initiated by company management; and conceptualized and implemented by the analytical and advisory 4CF Warsaw-based strategic consultancy, which specializes in business foresight. It was carried out in the first half of 2015 and consisted of the following phases:

Table 7.1 Comparison of strategic foresight implemented in a private company (case A) and in a public research institute (case B)

Strategic foresight characteristics	Case A private company	Case B public research institute
Challenge	Capturing technological change and thus supporting strategic investment decisions	
Objectives	Ongoing identification, monitoring, and assessment of upcoming opportunities and threats in a specific sector	Prioritizing lines of long term scientific research and development in selected thematic areas
Thematic focus	FMCG (fast-moving-consumer-goods)	Advanced manufacturing technologies
Implementation model	External (strategic foresight consultancy)	Internal (department of innovation strategies)
Methods	Workshops, interviews, Delphi, STEP, future scenarios/models, trend analysis, opportunities, threats, weak signals	SWOT, STEEPV, key technologies, structural analysis, scenario building, technology roadmapping, workshops, expert panels, online surveys
Outcomes	The database of trends: The Trend Lens Early Warning System (available within the company's intranet and updated regularly)	–List of key R&D priorities in five research areas –Three scenarios of scientific research development –Outline of a 5-year strategic research programme
Implications	–Decision-making system –Knowledge-management system –Further cooperation with the external foresight service provider through semi-annual workshops	–Further research pursued in the area of forward-looking methodologies –Follow-up strategic foresight exercises –Temporary changes in organisational structure
Time horizon	Medium-term (5–10 years)	
Financing source	Internal	Mix: internal and public funding
Realisation (year)	2015	2008–2010 with two follow-up rounds
Current use (in 2017)	Yes	No

Source Authors

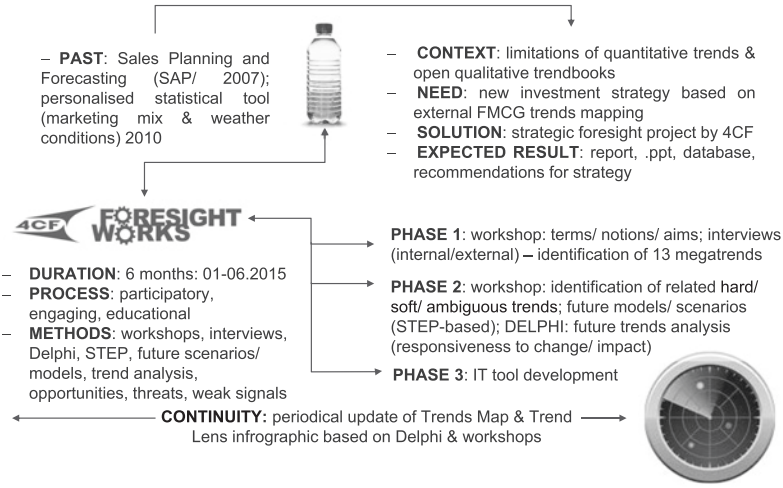

Fig. 7.1 Overview of foresight process in BEWA (case A) (*Source* Authors)

(1) methodological study, (2) execution of the study, (3) preparing a report entitled "The Trend Map", and (4) implementation of trends-based Early Warning System called "The Trend Lens". The process and the results are shown in Fig. 7.1.

The first stage of the project was a strategic workshop for board members and key company executives. To work out a common level of communication and introduce a shared concept of foresight, the current strategic objectives were analyzed and reframed in relation to improvised future scenarios. Then the set of 13 Megatrends that would affect the beverage market was identified. The next step consisted of workshops for generating subtrends resulting from the previously selected Megatrends. In total, several dozens of historical trends were identified and then divided into three classes: (1) hard trends,[1] which are characterized by high probability, (2) soft trends,[2] which are less predictable, and (3) ambiguous trends, which could bear both characteristics. This classification helped in the selection of trends to the Trend Map variation called Trend Lens—a continuously updated strategic management and early warning tool (see Fig. 7.2).

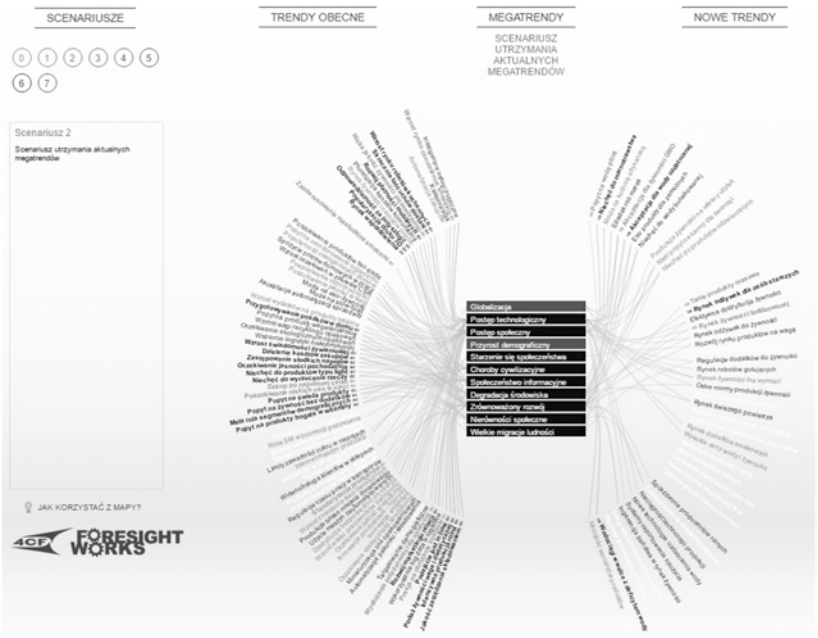

Fig. 7.2 BEWA Trend Lens screenshot (case A) (*Source* Archival)

At the next step, the 4CF team developed a set of 7 scenarios—Models of the Future. These models were in the form of narrative descriptions of the possible socioeconomic and technological development. They were used to generate the set of possible future trends through the confrontation of the classified initial trends, Megatrends, and Models of the Future. This collection helped the 4CF team to identify (using Delphi method) potential areas of threats and opportunities not yet addressed by BEWA's competitors.

The team then included the description of trends in terms of quantitative data—which was executed through interviews and Delphi surveys among employees and management, as well through reframing[3] of the Megatrends and Models of the Future—for the further data processing. The results of these operations were presented in report and presentation. The final step of this part of the project was the confrontation the results of the study with current strategy of the company in order

to update medium- and long-term development plans. The above was realized during the recommendations session conducted by 4CF for the management board of the company.

Practical results from the foresight study included the database of trends identified by The Trend Lens Early Warning System (updated regularly and available within the company's intranet) that need to be considered by BEWA while making decisions on investment. Among the key practical benefits for the company, there are the following:

– Knowledge about highly resistant trends (present with medium to high probability in at least 6 out of 7 scenarios);
– Systematic anticipation of new sector trends before they emerge on the basis of global megatrends (which triggers in-house innovation).

The described foresight process reflects a feedback loop: (1) The Trend Lens tool is updated quarterly based on knowledge management system and scouting, (2) the management board conducts a continuous analysis of the changing positive and negative external factors, and (3) 4CF moderates semi-annual workshops that aim to update The Trend Lens in the company's intranet.

In summary, the implemented approach met the BEWA's management's expectations in terms of getting methodically developed basis for verification of strategic objectives. The management board used the project's products to update the strategy and to verify the means of cooperation with key clients. After one year, since the end of the initial project BEWA is still effectively using the tool, which proves its value in managing the company's strategic development needs.

Foresight Impact and Sustainability Measures (Case A)

When trying to synthesize sustainability measures utilized in BEWA to sustain the future-thinking processes in the organization, it is inevitable to consider the main impacts of foresight activities. Based on the review of some foresight evaluation frameworks (Poteralska and Sacio-Szymańska 2014), the following immediate, temporary and ultimate

foresight impacts, which occurred at BEWA, could be distinguished (Table 7.2).

BEWA's management included knowledge from their foresight process in decision-making on all levels. Tactical decisions were made immediately following the realization of the gap between specific product innovation versus trend development. Planning and strategic communication were improved with new confidential knowledge to be used in exploration and negotiation talks with key partners. Successful strategic acquisition aimed at a "name brand" beverage company to improve market grip and capacity to execute strategic product innovation is a capstone undertaking cementing the new future-oriented strategic agenda.

Case B: ITeE-PIB—Public Research Institute

Institute for Sustainable Technologies (ITeE-PIB) is one of approximately 100 applied research institutes based in Poland, whose tasks are to solve practical problems of an individual or group of companies by applying the latest knowledge and technologies in the co-creation of useful products, services, and processes. ITeE-PIB employs approx. 240 specialists who pursue research in the following fields: surface engineering, manufacturing and maintenance, ecology and environment, industrial biotechnology, tribology, innovation management, and lifelong learning. It holds a unique status of a National Research Institute, which is given to public R&D entities performing research of highest importance to the national economy.

In 2008, ITeE-PIB took on a challenge to set detailed key priorities for its medium-term research agenda, which could be feasibly implemented in the Polish economy. The main objectives of this forward-looking undertaking were:

– To determine research priorities of the institute and a set of corresponding key technologies targeting manufacturing businesses;
– To build alternative scenarios for development of scientific-research at the institute;

Table 7.2 Foresight impacts at BEWA

Immediate foresight impacts	Intermediate (temporary) foresight impacts	Ultimate foresight impacts
• Gap analysis between trends and marketing strategy performed and results directly implemented into product range tactical choices • Increased understanding of the function of foresight among quality and product innovation staff	• Including confidential information from the Trend Lens visualization and sense-making into strategic communication with key partners and into investment decision-making	• Maintenance of competitive edge within strategic segment of the market to optimize company turnover and maximize net value • New investment advised by foresight knowledge
Metrics/Outputs		
• Launching of new product varieties with a more comprehensive bag-in-box NFC blended juice offer	• New private label product line aligned with strategic partners' new brand featuring BEWA innovative NFC and/or exotic juices incl. blended juices in innovative plastic bottle packaging • Strategic acquisition (horizontal expansion)	• Maintenance and expansion of strategically significant relationship with discerning buyers marketing BEWA strategic product innovation under private label
Timing		
2015	2015–2017	2015 onwards

Source Authors

– To design a research programme, that would allow to put the results of the institute's foresight into practice.

The process (Fig. 7.3) was managed by the internal team from within the Innovation Strategies Department.[4]

The main phases of the foresight process illustrated in Fig. 7.3 include (Sacio-Szymańska 2011):

– Analysis of the institute's research potential,
– Selecting priorities for R&D and recommending key technologies,
– Creation of alternative scenarios of the institute's R&D development,
– Development of operational plan for the implementation of the preferred R&D scenario,

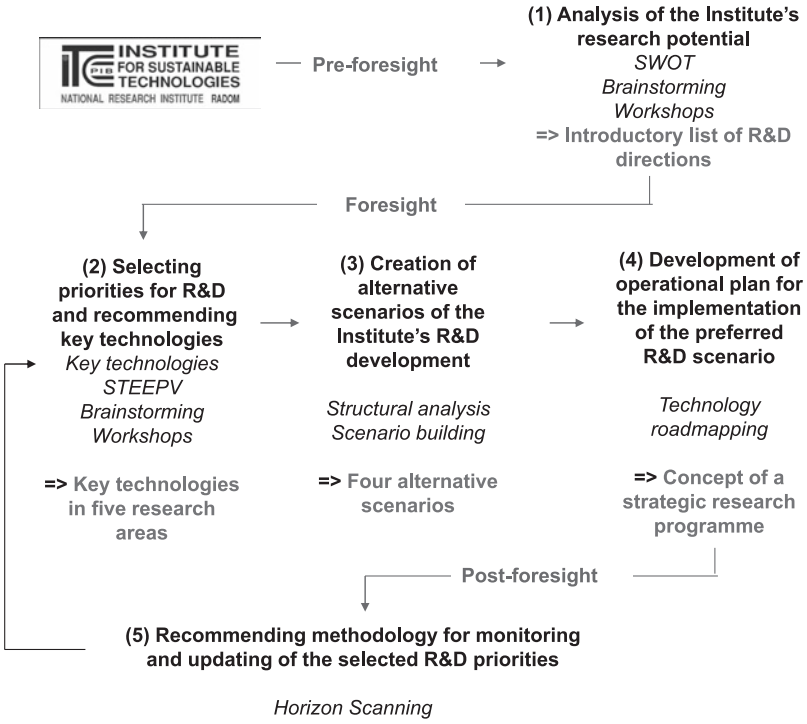

Fig. 7.3 Foresight process at ITeE-PIB (case B) (*Source* Authors)

– Recommending methodology for monitoring and updating of the selected R&D priorities.

The main methods used in the process were: SWOT, STEEP, scenario building, key technologies, technology roadmapping, and structural analysis. Additional methods included: expert panels, workshops, questionnaire surveys, and brainstorming.

Continuing, the processes of generation and selection of the promising R&D priorities and technologies were incorporated into the framework of a pilot strategic foresight project (own funding) and a sectoral foresight: "*Advanced industrial and ecological technologies for the sustainable development of Poland*"[5] coordinated by the institute within the Innovative Economy Operational Programme (EU-funding). Altogether, 74 technologies[6] were generated by internal experts representing ITeE-PIB and external experts representing science and industry. Each technology was characterized (Table 7.3) and the description included information whether the technology was already functioning on the market, was ready to be commercialized, was presently subject to testing or would only emerge in the future. The information on the sectors in which the technology was or could be applied was given, as well as, its development prognosis for 2015 and 2020 and the potential ecological, economic, and social impacts. Also, the alternative technological solutions and their application areas were explained. Information from technology characteristics cards was applied in the prioritization process of the technologies, in which the following criteria were considered:

Table 7.3 Fragment of the designed technology characteristics card

Thematic area:	Advanced material technologies and nanotechnologies and technical systems supporting their design and application
Name of technology:	Hybrid technology of increasing the durability of selected compounds of engines
Development phase of technology:	Design/development
Scope of application:	Mass scale application
Alternative technologies:	Production of coatings from materials resistant to oxidation

(continued)

Table 7.3 (Continued)

Description of technology:	*Aim of technology application*: To increase the endurance to high-temperature oxidation and erosive wear in gases *General characteristics*: Technology consists in the production of advanced material solutions with particular attention paid to hybrid coatings produced with multi-source methods
Areas of current application:	Energy, gas, hot water, air for air-conditioning systems production and supply
Expected development direction:	*2015 prognosis*: Increase of the endurance of ignition plugs of engines on bio-gas *2020 prognosis*: Increase of the durability of valve compounds of engines on bio-gas
Sectors of application:	*Current sectors*: Energy, gas, hot water, air for air conditioning systems production, and supply Example of application: to increase the endurance of ignition plugs of engines on bio-gas *Potential new sectors*: Water supply, waste and sewage management, and activities connected with reclamation Example of application: to increase the endurance of ignition plugs of engines on bio-gas

Source Authors based on http://www.foresight.itee.radom.pl/chartech/index.php (in Polish)

– Sustainable development including subcriteria of ecological, financial, and social effects (Destatte 2010);
– Critical level of technologies including the level of interdisciplinarity of solutions.

Both criteria were considered to be of equal importance, each represented numerically, however in the case of sustainable development criterion, the assigned points could be negative indicating potentially

detrimental impact of specific incremental and emerging technologies on the environment, or their hampering effects on the societal developments (if a solution raised, i.e., serious ethical concerns). The R&D priorities and technologies were grouped under 5 main research fields:

- Specialised research and test apparatus;
- Mechatronic technologies and control systems;
- Advanced material technologies and nanotechnologies;
- Environmental technologies, raw materials, natural resources, and renewable energy sources;
- Technologies of technical and environmental safety.

The next stage of foresight involved scenario building based on key factors and generated technologies determining the suggested scope of research. Key factors were selected with the use of quantitative and expert methods. As a result of the conducted analyses the two key factors identified included: *scientific and research potential* and *financial standing*. Following the scenario-axis technique, the two key factors were projected onto the Cartesian coordinates plane, where the beginning of the axis represented the lowest value of the factor, and the end—the highest (Notten 2005). The four areas marked in that way formed the framework for the creation of scenarios: A (Basic Research), B (Sustainable Development), C (Market), and D (Under threat of existence). Further analyses were focused on scenarios A, B, and C (the negative scenario was considered inadequate for directing future research of the institute).

The final phase of foresight at ITeE-PIB involved the conceptual design of a strategic research programme, which would allow for pursuing research in the five, aforementioned fields and in the detailed priority research directions. Such a programme was conceptualized, launched, and executed by the institute in cooperation with Polish academic institutions and enterprises within the Innovative Economy Operational Programme (co-financed from the EU structural funds) in the 2010–2015 period.[7] It aimed at the development of advanced product and process solutions ready for practical industrial implementation in the thematic fields corresponding to the ones identified within foresight exercise. An important thematic field of the programme

contributed to the research of knowledge and technology transfer processes. It allowed the internal foresight team to continue research on updating foresight methodologies and secured two follow-up rounds of internal foresight processes in collaboration with the institute's and external stakeholders. Nevertheless, after the programme ended in 2015, internal foresight activities were stopped as well.

Foresight Impact and Sustainability Measures (Case B)

The following immediate, temporary, and ultimate foresight impacts, which occurred at ITeE-PIB, could be distinguished (Table 7.4).

The key sustainability measure, which was applied at ITeE-PIB to maintain the future-orientation of the engineering staff (after the first internal foresight project ended), was the setting-up of a temporary task unit/team composed of young researchers who represented all research departments of the institute. Team members were responsible for performing horizon scanning to search for future technological and investment opportunities for their respective departments. The expected key success factor of the team's performance was the number of European project proposals in the institute's key research areas submitted and funded. The horizon scanning activity was an additional task of the team members, whose job description and standard daily activities involved pure engineering tasks. They were provided with methodological guidance and international networking support from the institute's innovation strategies department. What is more, the top management fully supported this organizational innovation.

However, in the long-run, the team dissolved. The discrepancy between each department's future research priorities and the individual call topics at EU-level was one of the key (external) factors that led to low success rate in the EU calls for proposals targeted by respective departments (10%). The hierarchical organizational structure, was another (internal) factor, which most likely affected the team's performance and ability to be successful in the long term. In the case of some departments, delegation of responsibilities did not imply the delegation of authority to subordinates, which made it impossible to immediately

Table 7.4 Foresight impacts at ITeE-PIB

Immediate foresight impacts	Intermediate (temporary) foresight impacts	Ultimate foresight impacts
• Articulation of joint visions and organizational priorities for the future • Better understanding of the function of foresight among engineering research staff • Effective actions taken	• Setting up a temporal team pursuing interdisciplinary research into foresight theory, technology assessment, and scientific-business cooperation • Setting up a temporal internal team of young researchers to perform horizon scanning for future technological and investment opportunities • Creation of follow-up projects	• Ongoing research into foresight theory and practice oriented toward foresight capacity building within the department of innovation strategies • Establishing foresight projects pipeline
Metrics/Outputs		
• The launching of a strategic research program	• Three PhD degrees in the field of foresight and technology management earned by ITeE's innovation strategies department employees • Ten EU-level project proposals in ITeE research priority areas submitted (one funded) • The launching of the Future Engineering conference (2014, 2015, 2016 editions)	• ITeE's active presence in key networks at local, national, or EU-levels in the field of foresight and Industry 4.0 • 4 EU-level project proposals in the field of foresight capacity building submitted (three funded, one under review)
Timing		
2010	2011–2016	2014 onwards

Source Authors

translate project ideas into actions. Both factors combined, contributed to the relatively short longevity of the team.

When initial organizational strategies proved to be short-term solutions; a new sustainability measure was introduced. It implied a switch from distributed technology foresight within various institute's engineering departments to enhancing individual foresight competence among selected employees of the innovation strategies department. It was achieved by partnering with the key national or foreign teams of foresight researchers and practitioners. In the longer term, the strategy resulted in ensuring a continuous pipeline of projects able to attract external customers interested in foresight capacity building.

Nevertheless, building internal foresight capacities across ITeE-PIB departments is itself, a thing of the future.

Comparative Analysis of the Two Cases

Organizational Motivation

In Case A, foresight was initiated by the company management board; conceptualized and implemented by the analytical and advisory strategic consultancy, which specializes in business foresight. The company's management decided to revise the company's strategy in order to support their medium term-oriented investment decisions. The study aimed to develop (1) a database and (2) a managerial presentation supporting the identification and monitoring of upcoming opportunities and threats present in the FMCG sector, as well as questioning assumptions through the simulation of possible changes.

In case B, foresight was initiated by the director of the organization; designed and managed by internal department of innovation strategies. The goals included the generation of the key long-term research priorities, the outcomes of which (i.e., technologies) should be successfully transferred to the commercial sector for public benefit.

In both cases, the underlying motivations for foresight triggered positive organizational changes, however, in case B, they were temporary. In

case A, given the period of time that has passed since the end of the project; it might be too early to conclude whether the so far positive trend of foresight continuity within the organization will last over time.

Methodological Approach

In Case A, foresight process consisted of the following phases: (1) methodological study, (2) execution of the study, (3) preparing a report entitled "The Trend Map", and (4) implementation of trends-based Early Warning System called "The Trend Lens". The final step was the confrontation the results of the study with current strategy of the company in order to update medium- and long-term development plans.

In case B, the main phases of the foresight process included: (1) methodology design, (2) analysis of internal research potential, (3) prioritising lines of R&I and the selection of key development directions, (4) creation of scenarios for R&I development, (5) elaboration of operational plan for the implementation of the preferred R&I scenario, and (6) methodology for monitoring and updating of the selected R&D priorities.

A formally organized, collective methodological approach was in line with the organizational culture of the institute in case B as opposed to less structured foresight processes implemented in more flexible organizational environments in business sector (case A). In spite of the rather traditional foresight methods used (in case B), the initial project objectives were met. Also, in the latter two consecutive internal foresight exercises at ITeE-PIB two methodological improvements were introduced.[8] However, the focus on the scientific weight of the methodology and the scientific evidence of the results did not help in counteracting the limitations of hidden assumptions (Miller 2007).

The surprise and groundbreaking change in organizational setting of all public institutes of applied research (including new laws set for introduction in 2018), which is taking place in Poland after seven years since the completion of the process, demonstrates that omitting the negative scenario ("Under threat of existence") in further analyses might have been a misjudgement, or biased decision. If openly acknowledged and addressed at

the time of the realization of the process, it could have widened the list of possible, yet challenging tactical options and thus might have helped the institute to be better prepared for the future.

In this context, the designers of the foresight process implemented at BEWA managed to keep it methodologically rigorous, but also more participatory, engaging and educational for the staff of the company. Foresight in the case A revealed common goals and shared assumptions about the future of the organization, it also united the management team and helped them to build confidence needed to make decisions about the future. As a consequence, the improvement of team and leadership capacities (Miller 2007) was another successful impact of the project.

Stakeholders Engagement

In case B, even though the number of external participants who contributed to the institute's foresight analyses surpassed the number of internal experts, their role in the foresight process was limited to the first phase of the research, (i.e., setting of R&D priorities). External personnel participation in the scenario building was restricted to the stage of selecting key influencing factors and the roadmapping phase, a strategy consistent with research findings by Phaal and Farrukh (2000). This phase was thus realized exclusively by internal research personnel of the institute. Not to be overlooked, however, the affiliation of external experts can have a positive impact. In case of the institute, which depends both on public and private financing, the involvement of the innovative SMEs representatives, as well as, relevant governmental stakeholders, should have been strengthened. Whereas, the academic background of the majority of experts may have resulted in the too scientific nature of the selected avenues for R&D development, thus only partially addressing the needs of the business sector.

In case A, on the contrary, a successful merger of confidentiality and participation in the foresight process at BEWA enabled focus on future competitive advantage and practical application of the knowledge generated to business decision-making in a multimillion PLN acquisition project started shortly thereafter.

Organizational Policy

In Case A, the practical result from the foresight study included the database of trends: The Trend Lens Early Warning System (available within the company's intranet and updated regularly) to support strategic decisions on investment, as well as, accessibility as a reframing device for short and mid-term decision-making. Foresight process has been a feedback loop: (1) The Trend Lens tool is updated quarterly based on knowledge management system and scouting, (2) the management board conducts a continuous analysis of the changing positive and negative external factors, and (3) strategic foresight consultancy moderates semi-annual workshops that aim to update The Trend Lens in the company's intranet.

In Case B, apart from mapping the array of research opportunities and setting the scene for pursuing specific technological and application—oriented projects, the organization set temporary teams that aimed to improve the efficiency of foresight methodologies and look for potential research and investment opportunities in the ITeE-PIB's priority areas. However, the organizational changes that facilitated conducting horizon scanning activities in a more systematic manner did not continue. No organizational policy was developed to clarify tasks and set criteria for accountability. Currently, in this case, it is more the task of individual research teams or engineering departments to set their research priorities and keep a sustained track of projects with business actors.

Management Strategies

Among the key practical benefits for the Case A company there were the following: (a) Knowledge about highly resistant trends (present with medium to high probability in at least 6 out of 7 scenarios); (b) Systematic anticipation of new sector trends before they emerge on the basis of global megatrends (which triggers in-house innovation). The implemented approach met the company's management expectations in terms of getting methodically developed basis for verification of strategic objectives. BEWA's management has included knowledge from their

foresight process in decision-making on all levels. The management board used the project's products to update organizational strategy and to verify the means of cooperation with key clients. After one year, since the end of the initial project, the company is still effectively using the tool, which proves its value in managing the company's strategic development needs.

Within Case B, 74 specific technologies were generated by internal and external experts, which were grouped under 5 main research fields, such as mechatronics and control systems, surface engineering, environmental and technical safety, research apparatus. They were the basis to design and launch, in the final and follow-up phases of internal foresight process, a 5-year long strategic research programme co-financed from EU funds, that aimed to pursue research in the so identified areas. However, in the long term, after the completion of the strategic program, the renewal of the R&D strategy was not pursued and the organizational change, which made cooperation among engineering and foresight teams feasible, appeared to be temporary.

Fulfillment of Objectives

In both cases, the objectives of the assumed foresight processes were met. However, unlike the situation in case A, the team responsible for the foresight exercise at ITeE-PIB did not succeed in proving the relevance and positive impact of foresight. Consequently, it did not manage to raise organizational foresight awareness among its hard science research staff. The failure could be associated with the neglect of agreeing (in advance) on the common dictionary of terms, objectives, and expected results with the key stakeholders in the organization.

The foresight team facilitating the process in the case of BEWA avoided making such a mistake. It launched the project with a strategic workshop for board members and key company executives in order to work out a common level of communication and introduce a shared concept of foresight in the context of the then-current strategic objectives of the company. Organizational culture, that is the role of hierarchy, individuality, and interdepartmental competition appeared to

be a factor that limited eliciting groundbreaking ideas and developing cross-cutting organizational vision (in case B). It later resulted in limited engagement and support for follow-up internal foresight activities.

Finally, after two further foresight exercises, the internal foresight process was temporarily suspended at ITeE-PIB and the responsible team started focusing on projects for external clients. On the contrary, the key members of BEWA continue using the database and the method internally, while regularly consulting the outcomes and possible upgrades of the tool and the monitoring process with the foresight consultancy. It clearly was a learning process that developed and embedded new organizational capacities and as such can be classified as a successful case for strengthening organizational foresight capacity and futures thinking.

Notes

1. A Hard Trend is a projection based on measurable, tangible, and fully predictable facts, events, or objects. It's something that will happen: a future fact that cannot be changed. Hard Trend categories include Technology, Demographics, and Government Regulations (Burrus 2014).
2. A Soft Trend is a projection based on statistics that have the appearance of being tangible, fully predictable facts. It's something that might happen: a future maybe. Soft Trends can be changed, which means they provide a powerful vehicle to influence the future and can be capitalized on (Burrus 2014).
3. Reframing is both a conceptual direction to think out of the box and a practical tool. Conceptually reframing means allowing the underlying beliefs commonly accepted within your domain or industry to surface, and to turn these around in order to come up with innovations (Wolfe 2016).
4. In 2009, within "National Foresight Programme Poland 2020" the institute's managing director coordinated the biggest of the three main research area panels, that is "Sustainable Development of Poland". ITeE-PIB staff was actively involved in foresight research, with Innovation Strategies Department designing detailed methodology and managing its implementation (Mazurkiewicz and Poteralska 2009; Sacio-Szymańska and Kuciński 2009).

5. http://www.foresight.itee.radom.pl/.
6. http://www.foresight.itee.radom.pl/chartech/index.php.
7. http://www.programstrategiczny-poig.itee.radom.pl/english/index.php.
8. (1) The improved scenario-building methodology encompassed a quantitative algorithm, which enabled more rigorous identification of key driving forces of highest influence and importance. (2) SWOT analysis was replaced with Intellectual Capital measurement methods, which helped better assess the institute's strengths and weaknesses by estimating the real value of the institute's IC assets (Leitner and Warden 2004).

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