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Information management in Polish industry. Diagnosis of the transformation results

Introduction
The aim of the study is to present the final conclusions of the analysis of the transformation in Poland after 1989, which the authors have reached and partially published since 2007. The final stage focused solely on industry was co-financed from ESF (European Social Fund)1. At this stage the method of a questionnaire survey of employees and employers [Report…, 2012] as well as comparative and complementary analysis verifying the results of the authors’ own research results from the methodology and data of Polish CSO (Central Statistical Office) as well as from British innovativeness strategy program KTP (Knowledge Transfer Partnerships) perspective were applied.

1. Identification of paradigms in Polish industry
21st century paradigms have been developed in the second half of the twentieth century as a result of intensive research in the basic sciences area, which materialized in the form of key technologies and the immensity of innovation (Figure 1). The main social paradigms2 include among others, information society and learning society, which are closely related to information communication technologies (ICT) as well as information and knowledge management [Covey, 2010, p. 19-50]. The paradigm of the dependence of context and comprehension with regard

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1 The study was conducted in 2012 for the needs of a testing innovative project with an over-national component “The way to professional excellence” realized within the Operational Programme Human Capital, Priority VIII Regional human resources for the economy; 8.2 Transfer of knowledge; 8.2.2 Regional Innovation Strategies; The Project Leader is NSZZ Solidarność of Gdańsk Shipyard.

2 The notion of paradigm is used in accordance with Covey’s interpretation, i.e. it means “a model, theory, perception, assumption or a reference point”
to the data, information, knowledge and wisdom has a permanent position.

Figure 1. 20th and 21st centuries science strategies

<table>
<thead>
<tr>
<th>Research and politics of innovativeness</th>
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<td>Basic sciences</td>
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<td>1945 50 60 70 80 90 2000 2010 2020</td>
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Source: Own elaboration based on [Wawarzyniak, 2004, p.279].

The ongoing degradation of industry in Poland mobilizes to search for the reasons. One of the directions of searching is to identify contemporary paradigms in the activities of industrial enterprises. The authors inspired and participated in 2012 in opinion surveys of over 200 employees of technical engineering positions in 50 design-production companies in Pomorskie Voivodeship. The studies were multidimensional and separately addressed employees and employers and, among others, two opinions focused on innovativeness of their companies:

- in my opinion the company I work for (I represent) is an innovative/modern one;
- in my opinion the company I work for (I represent) encourages its employees to implement changes/innovations.

Opinions on innovativeness and employees encouragement to implement innovations were highly optimistic as 60-70% of participants responded positively. Employees’ opinion is significantly better than the employers’ (the difference equals to ca. 5%, 12%). However, after the analysis of the answers to the questions concerning the use of ICT, it has proved that 44 – 55% of the respondents believe that technologies used in their companies are out of date, 79 – 86% declares the need to apply better ICT to make their work more effective and 75 – 85% need ICT software which is easier in use and providing with wider possibilities of applying ICT. In this case it were also the employees who assessed the situation in the company better than the employers (the difference equals to ca. 7%, 10%, 11%).

The results obtained in Pomorskie Voivodeship are significantly wider (research areas include: adaptability, flexicurity, new technologies,
education, co-operation), but unfortunately there are more similar discrepancies between the declared and observed values, which makes the concluding on realities more difficult. In view of the above, they have been related [Innovative, 2011] to the results of the national surveys conducted by CSO (Central Statistical Office). The key to concluding on the innovativeness of industrial enterprises in Poland is their differentiation depending on the number of persons employed, which is presented in Figure 2.

Figure 2. Industrial enterprises innovatively active and innovative in Poland by the number of persons employed in 2008-2010 (% of general number of enterprises)

Source: Own elaboration based on [Innovative, 2011, p.19, 23].

Unfortunately in Poland, fewer than 10% of small industrial enterprises were innovatively active\(^3\) or innovative\(^4\) in the years 2008 – 2010, ca. 30% of medium enterprises, ca. 50% of big ones employing up to 499 persons and 60-70% employing above 499 persons. Thus, the condition of an enterprise active innovatively in Polish industry fulfilled only 18,1% enterprises, which accounts to ca. 36000 industrial enterprises (excluding micro-enterprises).

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\(^3\) An enterprise active innovatively means an enterprise which in the studied period implemented at least one product or process innovation or realised in this period at least one innovative project which was stopped or abandoned (finished without a success) or had not been finished by the end of this period (i.e. is continued).

\(^4\) An innovative enterprise in the range of product and process innovations is an enterprise which in the studied period launched at least one product or process innovation on the market (a new or an essentially improved product or essentially improved process).
2. Problems of sources of information in Polish industry

Should we assume the paradigm of innovation is "the adequate one", the results of this research do not prognosticate to well for the future of Polish industrial companies and it is worth searching for the main reason of such a state and working out the solution guaranteeing the improvement in this area. The authors found, that the foundation for working out a supporting solution should consist in the analysis of the importance of the information source for researched industrial enterprises. The following 13 sources of information can be considered important. They can be arranged in 4 groups: internal (2), market (4), institutional (5), other (2), i.e.:

- internal 1: inside the company (its own research and development resources, managing personnel, marketing services, sales department, etc.);
- internal 2: other enterprises belonging to the company group;
- market 1: machines and technical devices, equipment, materials, components and software suppliers;
- market 2: customers;
- market 3: competitors and other enterprises from the same branch of industry;
- market 4: consulting companies (consultants), commercial and private R&D laboratories;
- institutional 1: research institutes;
- institutional 2: universities;
- institutional 3: science and technology, specialist and professional societies and associations;
- institutional 4: establishments of Polish Academy of Sciences;
- institutional 5: foreign public research institutions;
- other 1: conferences, fairs, exhibitions;
- other 2: scientific/technical/trade journals and publications.

Figure 3 presents the significance of individual information sources. The results show how incredibly low support obtain industrial enterprises and from institutional sources of information (1-5) in particular. Obviously the responsibility for such a situation has to be searched for on both sides: one possessing information essential for industry functioning and the other managing information and its sources in industrial companies.
The above results in significantly low results connected with cooperation in the range of innovative activity, which means an active participation with other enterprises or non-commercial institutions in common projects (Figure 4). In the conducted research the definition of such cooperation was very broad and assumed that it may be of a perspective and long-term character and does not have to result in direct, measurable, economic advantages for the participating partners.

In the case of cooperation of industrial enterprises in the range of innovative activity the diagnosis of such a situation was identified and published in previous works by the authors [Sala, Tańska, 2007, p. 85-95]; [Sala, Tańska, 2008, p. 1038-1041]; [Sala, Tańska, 2009]; [Sala, Tańska, 2010]. This diagnosis can be explained as the “lack of trust” and a low tendency to share knowledge, which in the opinion of the authors, results from the system transformation. The above is clearly confirmed by the results of the previously mentioned studies on partners of cooperation of companies in the range of innovative activity conducted by CSO [Innovative, 2011, p. 88]:
- foreign R&D public institutions (0.6%),
- establishments of Polish Academy of Sciences (0.9%),
- competitors and other companies from the same branch of industry (3.2%).

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5 CSO research assumed, that contracting works externally without an active participation in their performance cannot be considered as a cooperation in the range of innovativeness.
– consulting companies (consultants), commercial and private R&D laboratories (7.8%),
– universities (11.1%),
– research institutes (11.4%),
– customers (15.7%),
– companies from the same branch of industry (19.6%),

machinery, materials, components and software suppliers (29.7%).

Figure 4. Industrial enterprises in Poland which co-operated in 2008-2010 in the range of innovative activity by the number of persons employed in 2008-2010 (% of enterprises innovatively active)

Source: Own elaboration based on [Innovative, 2011, p.85].

The analysis of categories of partner institutions with which the co-operation in the range of innovative activity was most advantageous for enterprises is very difficult due to the fact that Polish industrial enterprises have the greatest confidence to equipment, materials, components and software suppliers, but only 30% out of ca. 36,000. While nearly 0% of industrial companies co-operated with foreign and Polish research institutions (PAN), and their trust to universities and research institutes was at the level of 10%. The tendency to co-operate within the cluster\(^6\) initiative was studied as well, but as it is easy to foresee this

\(^6\) Cluster an cluster initiative – according to M.E.Porter’s definition – a cluster is a geographical concentration of mutually connected companies, specialized suppliers, companies providing services, companies active in similar sectors and institutions connected with them (e.g., universities, trade associations, financial institutions) in individual branches, competing among themselves, but also co-operating.
activity is only symbolic. For the needs of the study the cluster initiative was understood as co-operation links based formally on the letter of intent, association agreement, agreement of consortium foundation, etc.

3. On the border of science and practice

If a paradigm is a theoretical or ideological product or it is culturally strange, it is perceived by the active in practice as a myth. Unfortunately in Polish socio-economic life the spheres of science and practice function separately. They recognize the need to start co-operation but they lack mutual trust, methods and skills. In other countries similar phenomena are also observed, however, such obstacles may not be observed to such extent as in Poland. The authors studied the British Government model to motivate enterprises to co-operation with scientific institutions and innovativeness (Knowledge Transfer Partnerships [www.onlinektp.en, 2013] programme) as well as with its effectiveness and efficiency. Without any doubts it is a perfect solution worth its adaptation, but unfortunately it is not included in the present Polish government pragmatics. Other proposed solutions of this problem will only be a substitute in relation to the current state which the authors verified in initial studies preparing the assumptions for the project “Cultural and Technological Adaptation in Industry”. The knowledge of present paradigms as well as of methods and skills supporting them is essential for persons’ and organisations ability to survive. The authors chose the elementary paradigms, methods and skills accompanying the “formation” of an information society (Table 1) and verified the level of their acceptance by representatives of industrial enterprises (employees and employers) in Pomorskie Voivodeship. However, significant discrepancies between declared knowledge and their practical use were observed. The results of the survey on the a small sample group from Pomorskie Voivodeship were similar to the results of the national survey in respect to the selected methods (col.2 Table 1) of stimulating employee’s creativity and the use of selected employee’s skills (col.3 Table 1). In the national survey of industrial enterprises the percentage of those which apply methods of stimulating employee’s creativity is dim as for individual methods it amounts from 10% to 19%.

The authors studied to a deeper extent employee’s incentives methods and employee’s training. Unfortunately the results were incredibly low. For example, above 40% of employees on technical and
engineering positions have not participated in any kind of training or obtained new knowledge for two years. Moreover, 78% of employers are interested in supporting their employees by providing them with training (advanced ICT), but only one out of five does not see a problem in financing such training. It means, that Polish enterprises are not focused on stimulating creativity, do not use selected employees’ knowledge management methods, do not invest in their training and incentives. Unfortunately they do not even use intensively their employees’ additional skills (col.3 Table 1) which are specifically useful in undertakings of innovative character (from 13% to 37%).

Table 1. Selected social and managing paradigms, methods and skills

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<tr>
<th>Paradigm</th>
<th>Method</th>
<th>Skills</th>
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<tr>
<td>Information society</td>
<td>Multidiscipline or interfunctional working teams</td>
<td>Engineering, applied sciences</td>
</tr>
<tr>
<td>Learning society</td>
<td>Employees rotation among different departments</td>
<td>Mathematics, statistics, data bases management</td>
</tr>
<tr>
<td>Information management</td>
<td>Non-financial incentives for employees</td>
<td>Multimedia</td>
</tr>
<tr>
<td>Knowledge management</td>
<td>Training for employees</td>
<td>Market research</td>
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<tr>
<td>ICT</td>
<td>Financial incentives for employees</td>
<td>Objects and services design</td>
</tr>
<tr>
<td>Information sources</td>
<td>Brain storm</td>
<td>Software creation</td>
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<tr>
<td>Partners co-operation</td>
<td></td>
<td>Graphics, composition, structures, publicity</td>
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<tr>
<td>Innovativeness</td>
<td></td>
<td>Web design</td>
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Source: Own elaboration based on [Innovative, 2011, p.78, 80].

Technology transfer and issues connected with protection of intellectual property are among the appreciated management paradigms. To the types of new technologies which are subject to the phenomenon of the transfer belong among others: licences, research and development works, means of automation of production processes, consulting services. A competitive position of an enterprise, and of an industrial one in particular, is strictly connected with its purchase and sale, whose state in the years 2008-2010 presents Figure 5. The number of purchases is
relatively small (for ca. 197 000 of functioning industrial enterprises and ca. 36 000 innovatively active), but unfortunately the sale is of symbolic size.

Figure 5. Number of industrial enterprises participating in technologies transfer in Poland and EU in 2010

![Chart showing comparison of technologies transfer in Poland and EU in 2010](image)

Source: Own elaboration based on [Innovative, 2011, p. 93,94].

It is necessary to state in the diagnosis of the transformation results that in Poland at the beginning of the transformation small and medium enterprises developed incredibly quickly due to the fact that their starting position was definitely better than in other post-communist countries i.e. 50% of agriculture was in private hands, there were above 100 000 private shops and above 450 000 private craftwork companies. At present small and medium enterprises count to over 99% of all enterprises in Poland and they generate ca. 60% of GDP. Undoubtedly it is the result of hard work of Polish enterprises. No one doubts that due to the hard work of Polish entrepreneurs and their high talents and skills, the relatively small results of the global crisis are observed in Polish economy. Employees as well as employers are well educated and very flexible. Unfortunately the lack of co-operation of the scientific sector (R&D) with small and medium enterprises is observed.

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[Statistical ..., 2012] the amount of 197 418 industrial enterprises refers to year 2011, in this amount: 192 619 enterprises employ 99 and fewer persons, 2539 employ 100-199 persons, 1618 employ 200 – 499 persons, 391 employ 500 – 999 persons, 251 industrial enterprises employ 1000 and more persons.
Conclusion

One of Professor J.Bańka’s thoughts of technique philosophy explains that “The crisis of modern civilisation is to a significant measure the crisis of a human’s reliability in the situations of innovation concentration” [Bańka, 1980, p.198]. The concept of human’s reliability is certainly ambiguous but it also has deep cultural and historical reasons [Bańka, 1980, p. 341-344]. Poles’ historical reasons are surely different and incomparable with the experience of other nations, which in consequence results in different cultural cause and effect relations. “The cultural trend in management struggles with basic epistemological problems relating to the ways of comprehending the organizational culture. The consensus on the ways of comprehending or on paradigms of organizational culture does not exist among the researchers” [Sułkowski, 2012, p.188]. Nevertheless it seems undisputable to link culture with organisation, which methodologically justify among others [Smircich, 1983] and [Janicijevic, 2011]. The studies conducted among others in Polish ship industry [Kania, 2007] confirm the right direction in searching for solutions dedicated to Polish industrial enterprises.

In summary of the previous reflections on the condition of Polish industrial enterprises in the first decade of the 21st century, the authors wish to point out to the elementary reasons of their continuous degradation leaving aside the ones universally diagnosed. Thus, an enterprise cannot be an innovative or innovatively active without:

– objective identification (employee’s and employer’s self-reflection) of their activity state, and in consequence without reliable and advanced ICT applications,
– use of variable sources of information, and in consequence without co-operation with other subjects active innovatively,
– resignation of making allowances by small enterprises,
– using effective methods and skills, and in consequence without the consciousness of paradigms essence (independently of the fact a paradigm is a theoretical or ideological product or it is culturally strange),

8 “80% of entrepreneurs’ complaints refers to the irrational tax system, excessive reporting system and difficulties with interpretation of Polish law. The troublesomeness of numerous state institutions is the following one. I mean here prosecutor’s office and tax services” the interview of 16th October 2011 with J. Steinhoff, the deputy prime minister and economy minister in J. Buzek’s government.
training and reliable communication among employees, employees and employers, an enterprise and subjects of socio-economic environment,

consciousness of organisational culture and applying its aspects in the enterprise management.

On one hand it is difficult to perceive the Poles as people deprived of creativity, and on the other hand, we observe a very low innovativeness of enterprises (both industrial and service ones). The past 30 years of system and socio-economic transformation in Poland is to be identified as the restricted trust and restricted co-operation in relation to the information management. According to R.S. Covey these two measurements – trust and co-operation affect the level of communication. He mentions three crucial for individuals and teams communication levels: defensive, with a respect mechanism, synergic.

The defensive level of communication can be considered for the underestimated diagnosis of transformation results, and at the same time the most important reason of socio-economic life difficulties (among others J. Sala, H. Tańska) [Sala, Tańska, 2008, p. 1038-1041]; [Sala, Tańska, 2007]; [Sala, Tańska, 2005]. Low trust and low co-operation result in communication assuming the result of winning – losing or losing – winning. Achieving the levels of communication with a respect mechanism (a compromise) and synergic (winning – winning) constitute a barrier. The history will assess whether this specific defence strategy is suitable for surviving the present socio-economic crisis. Undoubtedly the cultural and historical reasons are justified here, even in the view of the Washington Consensus (according to [Stiglitz, 2006]). Whereas, the information management in such a context is illusory.

References
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7. *Report from the diagnostic survey of employees on technical and engineering posts in design and production companies in Pomorskie Voivodeship. Diagnosis of the needs and potential in the range of ICT tools* (2012), Analysis within the Project “The way to professional excellence” NSZZ Solidarność of Gdańsk Shipyard, Gdańsk.


Information management in Polish industry. Diagnosis of the transformation results (Summary)

The authors present the diagnosis of the results of the social and economic transformation in Polish industrial enterprises in the view of paradigms connected with information management and ICT. The diagnosis is based on the results of the research conducted in Pomorskie Voivodeship in relation to the national research of the Central Statistical Office (CSO) on the innovativeness in the industry. The results show that the paradigms leading at the turn of the twenty-first century, i.e. information society, knowledge management, innovativeness etc. are of the secondary importance in the observed struggle to survive in the unfavourable conditions. The study constitutes the base to justify the need to undertake activities taking the cultural and historical reasons into consideration.

Keywords
transformation results in Polish industry, innovativeness, sources of information, co-operation, information management.