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## HOW NOT TO LOSE VALUABLE KNOW-HOW IN AN INDUSTRY?

**Summary.** Know-how belongs to the intangible assets of enterprises. They are defined as information consisting of verified in practice technical knowledge and skills in goods trade (which are not covered by patents) allowing the entrepreneur to achieve a competitive advantage. Intangible assets are currently the key resource of enterprises, within which innovative competencies are included. They are not visible in the balance sheets of companies, they do not grow in proportion to property investments and do not yield to ownership. They have a spatial dimension of a special character, and they create the intellectual capital of the organisation, which along with the acquired knowledge, using active growth factors, can gain the ability to process innovations and act towards the development of the organisation. However, this is not always the case, hence, the attempt to answer the question of how not to lose valuable know-how in an industry. The conducted surveys among enterprises providing services for the industry have shown that they have innovative potential. This means that not only the industry and its development may affect the service sector and its performance, but the reverse - the service sector may influence the demand of the industrial sector. The article presents the potential for innovation growth with the employees' own knowledge.

**Keywords:** industrial enterprises, know-how, acquisition and loss of knowledge

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## 1. INTRODUCTION

Forecasts for the future indicates the decline of production in the traditional form. The increase in the share of services provided to industries is a determinant of changes in the industry. This process does not proceed in a uniform manner; some industrial functions based on outsourcing, are adopted from industrial enterprises to the service sector or industrial related services remain in the industrial sector, as activities provided by a service entity linked by capital or provided by employees. Such a limitation of strictly production activities and a statistically visible increase in services in the industrial sector, however, does not entail any increase in market competitiveness as if it were done in the case of services provided by external entities. There are benefits here, which lead to an improvement in the allocation of resources and the possibility of achieving profit specialisation and they result from changes in the value chains of industries and services (in industry reduction and in services growth of value chain), considered by industries, show economic benefits from the scale of outsourcing [4].

Globalisation has created many conditions, including for industry products. Currently, industries require much more services than several years ago and this trend is still growing. Global competition means, among other things, offering the best product or service at the lowest price [8]. As a result, the quest for ways to reduce costs leads to business mergers or closures of companies, and mergers of companies resulting in the emergence of enterprises that seek to dominate on a global scale. All forms of mergers bring redundancies as well as changes in the labour market.

A deeper analysis of the mutual relations between industries and services, which goes beyond the statistical data on employment and value-added services, makes it possible to recognise from the point of view of industrial development that the industry sector is more important for the service sector or inversely. This type of extended analysis also shows the area of so-called "Related services", that is, services for which demand increases appear as a result of increased demand from the side of the industry. There are intensified interactions in the area of "related services", industry for the development of the services sector and the simultaneous impact of the services sector on the productivity of the industrial sector. Moreover, we not only observe an increase in the demand for services related to the production industry but mainly the growing interdependence of industries with service companies. It means within the sectoral integration of production and services, which in consequence results in the growth of intersectoral links (industries and services) and the development of new organisational forms in industries.

Linking services to industries can be understood in two ways. The first method comes from the industry specified in the official statistics for which its services are defined. In this case, the services also include related companies. However, the problem is that the services are provided to other service providers who are often industrial enterprises. It is difficult then to distinguish which services depend on the demand for manufacturing companies and which do not. The second problem is the criterion for the division into services related to a specific industry and to the industry sector, in general. In this sense, an industrial enterprise that in part of its process is included in the production process of another industrial enterprise provides service around the industry, but official statistics do not include this and both companies are included in the industry.

The second way to understand industrial services is to perceive them as services provided by emerging industrial enterprises in connection with the supply of industrial products to other companies. This distinction concerns the development of cooperative services in

industrial enterprises, which distinguish this difference as a product-service in their own reports as part of the industrial benefit.

The analysis of the process of building innovative competencies of enterprises with any types of market competences, which are often accompanied by the possession of specific innovation potential, was carried out using the MeRKI-U method [1]. The methodology refers to enterprises that can build their innovative competencies from scratch, they can develop the already existing innovative potential, and can also assess the impact of innovation potential or competences on the value of the company.

The method has been verified in the research project 4126/B/H03/2011/40 “Methodical basis for the dynamics of development of industrial services in Poland for the purpose of merging the European Union market”. The research subject was based on the analysis of technological connections between the industry and the service sectors in Poland, guaranteeing the development of industrial related services. For the purposes of the integration of the industrial services market in the EU, it was necessary to recognise whether the innovative domestic industry provides the services sector with new technologies and knowledge, mainly through the supply of intermediate products and the kind of absorption capacity the service sector have in Poland.

The cooperators were identified in ten selected branches of industry in terms of establishing the dynamics of development of industrial services in Poland and the links between intermediate products and services and the industry. The research concerned a representative sample of 100 classified enterprises into 10 selected industries, that is, mechanical, construction, textile, plastics, chemical, power energy and electricity, cross-industry services, machinery, food, and paper and printing industries. The survey was conducted in Poland, in the form of direct interviews, using a questionnaire. These were mainly individual interviews with the representatives of management boards and extended interviews with the owners or co-owners of the surveyed enterprises, at their respective company headquarters.

The surveyed enterprises varied in size (small, medium, large), ownership relations (private, state treasury), capital origin (Polish, foreign and mixed capital), industry and voivodeships. The sector of small and medium enterprises was the dominant environment among the surveyed enterprises, while large companies constituted the minority.

Small enterprises were dominated by services provided for one industry (53%). Medium and large companies usually provided services for two or three different industries. Services related to the manufacturing process is foremost, product-related services came second; the lowest percentage concerned the service industry. The structure shown is a reflection of the current needs of the Polish industry, which in the context of ownership changes resulting from privatisation, are characteristic of countries after systemic transformation. The market of machine and equipment maintenance services has been limited due to the introduction of internal servicing within the corporate organisation. Other companies that have modernised the machine park also make use of the maintenance service provided by suppliers, obligatory during the warranty period and for the most part in the further period of operation. Enterprises largely lost their machines and devices of the older generation replacing them with modern machines, and thus, the market of maintenance services changed. The maintenance services market is dynamic in relation to domestic suppliers as it mostly concerns IT services, electric motors, etc.

The majority of surveyed enterprises (over 90%) are engaged in pro-innovation activities, both products and processes.

This paper in its theoretical part addresses the circle of scholars studying and describing the phenomena of knowledge management. In the practical (research) part, it focuses on specialists and managers professionally involved in the management of corporations and enterprises, who often face the problem of assessing the value of innovative enterprises in the perspective of increasing the company's value.

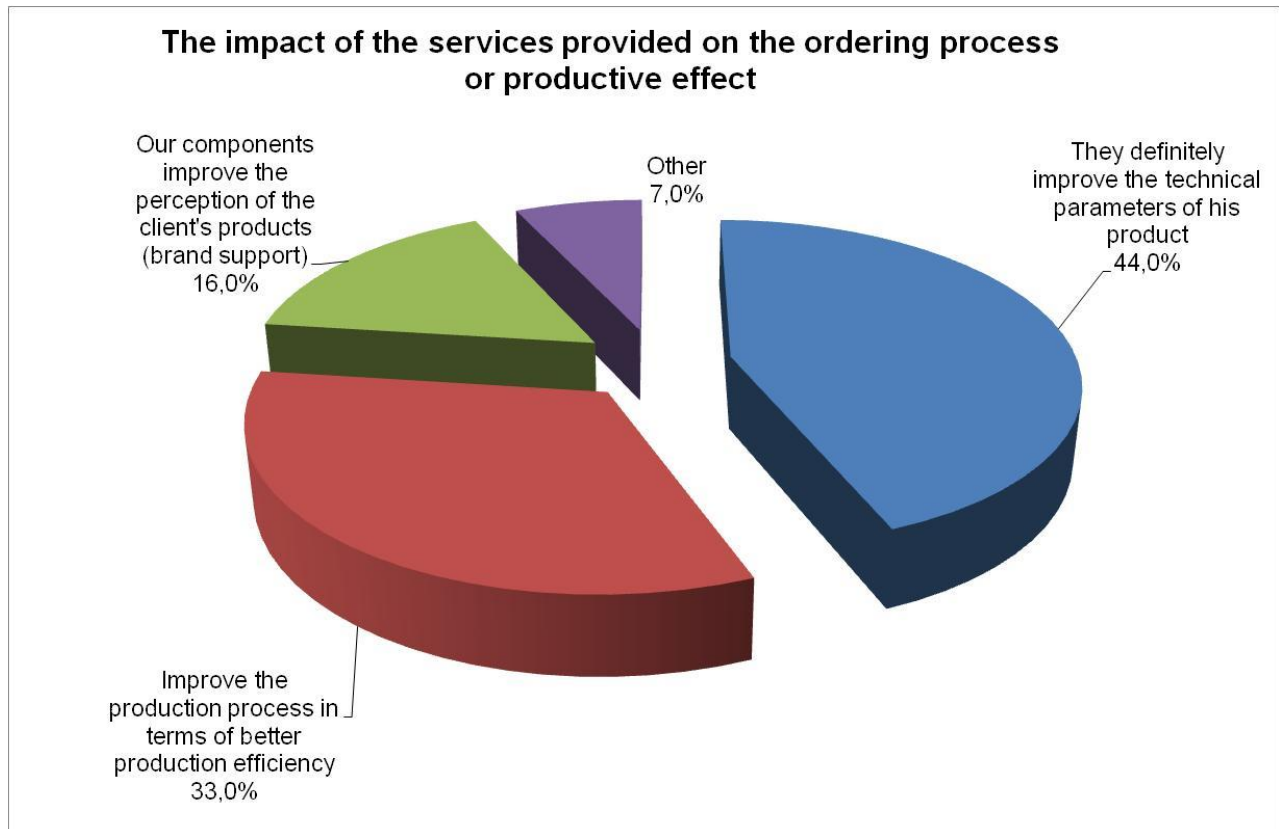


Fig. 1. The impact of the services provided on the ordering process or productive effect  
Source: author

## 2. SERVICES DEVELOPMENT ON A GLOBAL SCALE

In a direct way, industrial-related services are part of industrial added value and they concern the production process or the product itself. Services are understood as cooperation in the process of making subassemblies, parts, elements and components or providing production services in the scope of processing or refining of the products ordered by contracting entities as part of the logistics supply chain. These are often manufacturers executing orders from other manufacturers (as an intermediate product) and contractual relationships between them. Indirect production may be associated with the product - for example, packaging, conditioning, completing, etc. or with the production process - components included in another product ordered by its manufacturer, with specific technical and operating parameters, moulds, specialist tools etc. made from own or entrusted materials or services on entrusted materials.

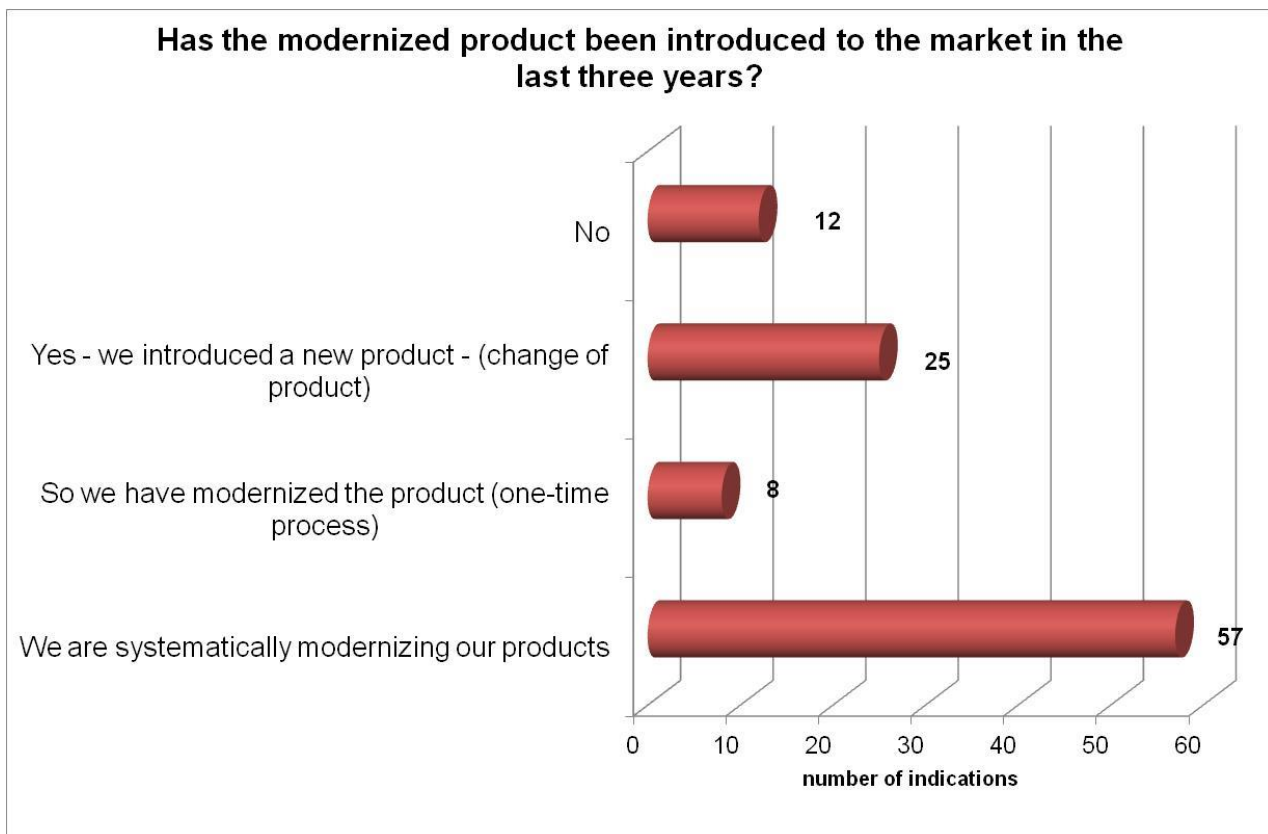


Fig. 2. Has the modernised product been introduced to the market in the last three years?

Source: author

The needs of services on a global scale mean that their character has changed. The need for global communication, transport, planning needs, market information, etc. is different today. This change made it almost impossible to sell industrially produced devices or products without additional services. Customers' expectations also concern 'pre-sales' and 'after-sales' services.

The number of industrial products is increasing, in which services cease to perform auxiliary functions and start to play a major role, thus, contribute to the company's profit. This is the case when the use of the product depends on the offer of services (service, software, facilities, etc.). In some cases, the share of industrial services in the value-added chain of producers exceeds even 50%. In many transactions of investment property, lessors, maintenance service companies and companies offering software are taking part simultaneously. Without their participation, the sale of some products would be significantly hampered or even impossible. This strong hybrid combination of goods with the existence of services has created the concept of a "bundled product" – prearranged combination of a given product with other services offered at an inclusive price. In such cases, the definitions of industrial production and services are blurred. An example could be the production of television sets, which would be impossible to sell without access to television programs as complementary services.

Industrial related services can be classified differently, but two groups are visible from the point of view of a close relationship with an industrial product. The first group of services is to launch the product and enable it for usage. These are typically technical services related to documentation, assembly, installation, maintenance, repairs, training. The second group of

industrial services includes the offer of services that increase the value of an industrial product for the buyer, for example, financing, insurance, service packages, etc. In this kind of service-related products, the interaction between producers and customers is usually higher than in the first group of products related to services. At the same time, the flow of information from buyers to suppliers of this type of services is particularly high, as financial service providers and insurers have access to the specific field of the client's business. In this way, if necessary, you can get data for managing customer relationships and cross-selling of other goods or services that are offered by industrial enterprises.

Sophisticated buyers can be attracted and maintained only by the offer of newer and more innovative products and services. It also requires focusing on the development of services that are tailored to individual customer segments. In this context, it is very important to exchange information with clients. This means that in the case of new insights and changing customer needs, industrial enterprises with high production flexibility can react quickly to the product. Therefore, it is not surprising that the increasingly widespread use of information and communication technologies in recent years has given a significant boost to the development of products related to services.

Foreign direct investments in the internal market are dominated by services. Given the fact that services also control the European economy, the potential benefits of merging the service market can be enormous. This explains the importance of the Services Directive [3], which shows the full potential of the EU service sector. This potential, however, is not fully used. The problem is that despite the possibility of increasing foreign investment in services by 20-35%, the services market is not fully regulated by law. National law can work in favour of domestic companies and at the same time discriminating foreign companies. The lack of competition in the financial services sector leads to the conclusion of unfavourable contracts by customers: (high prices, less availability of credit). It is estimated that existing barriers to foreign companies in the financial sector caused an increase in prices by an average of 5.3% in 2005. The elimination of such barriers would increase wages and salaries throughout the EU by 0.4% on average and increase employment by 0.3%. In addition, with a merged market, there is potential for an increase in European trade by 15-30%.

Foreign investments within the EU-15 are focused on the service sector. In general, the share of foreign investment in services is three times higher than in production; (in 2002, the share of services was eight times greater). European companies put services overproduction like in other regions of the world, but significantly less than in Europe.

German research on the determinants of the expansion of services related to industries has shown great determinants in the development of industries and industrial services [5]. Germany has a competitive advantage mainly in the production of high-tech equipment, but the high export rate also applies to pharmaceutical firms, chemical companies, machinery industry and transport as well. In comparison with the rest of the production, they show a high level of growth in demand for services. This sub-sector represents a demand factor of exceptional importance and shows the highest expenditure on development and innovation.

### **3. INNOVATION OF THE INDUSTRIAL RELATED SERVICE SECTOR**

The challenge for the scientific world in Poland is to develop a knowledge-based economy faster than other countries do. The partners in this matter are enterprises that need to invest in innovation to participate more in international markets. According to IFW [6], the decisive factors for successful management results are innovations and the process of

disseminating it. Innovation is the ability to develop and implement new solutions, both technological and organisational, which affects the competitiveness of enterprises and other organisations.

In an innovative process consisting of many stages, the most important issue is the organisation's ability to transform innovation for its own use. This ability is called innovative competence. Intangible assets are currently the key resource of the organisation, within which innovative competencies are included.

The most significant are changes in the way the information is being used and how much the perception of its value has evolved lately. Nowadays, information has become a source of wealth and career. These changes can be observed in the whole economy. Even those entrepreneurs who operate on the market in a traditional way now use electronic devices and way of obtaining information and communicating with the environment and employees. This means that intangible resources, not material as formerly held have become a source of economic value. Affluence is determined by knowledge, inventions and intellectual property.

We have entered the era of information with all its consequences in terms of methods of obtaining information, its processing speed and value for creating profit. Enterprises today have smooth organisational structures and multidimensional networks of informal relationships based on intellectual values of employees. Qualifications, know-how and specialist knowledge of co-workers have an increasing impact on the strategic success of the company. At the same time, faster technological development means that the distance to the once acquired knowledge is on the decline, hence, the need for more investment in the most important factor of success: company's know-how.

The organisation of the virtual environment and tools is not hierarchical; it does not have structural characteristics in the traditional sense but ensures the relative stability of the organisation of this virtual background. This is due to the "IT core", which is distributed horizontally in the form of a network (Fig. 3) and it is expected to be a strong structure that can carry significant loads.

The electronic economy based on IT features means that it is possible to achieve huge economic effects in the new conditions of communication and cooperation, but at the same time, changes can be observed in the old ways of doing business. The market of an IT-based economy is not divided; you can make transactions of material, financial and intellectual property. The present-day local entrepreneur who exists in virtual reality has access to the global market.

Tracking the achievements of Scania, which has increased the number of alliances in five years with a virtual crew scattered around the world, it has been demonstrated that human capital is decisive in the knowledge age and that intellectual capital is crucial to the long-term success of the organisation.

Intangible resources include assets and competencies [7]:

- the assets are determined by such elements as patents, trademarks, brand names, copyrights, databases, contracts concluded, commercial contracts and company's reputation,
- competences are determined by knowledge and skills of staff and employees, ability to learn and implement changes, and organisational culture.

Competence Management (Fig. 4) is an organised, methodical activity conducted by the organisation by performing the following functions:

- determining the competencies necessary for individual positions,
- determining the employees' individual competences,

- determining the possibilities, interests and preferences of managers and employees in terms of the development of their competences,
- determining missing competencies in relation to job requirements,
- undertaking a set of activities in order to complete missing competences,
- substantive and psychological preparation of managers and employees to function in the changing conditions in order to meet the company's development needs.

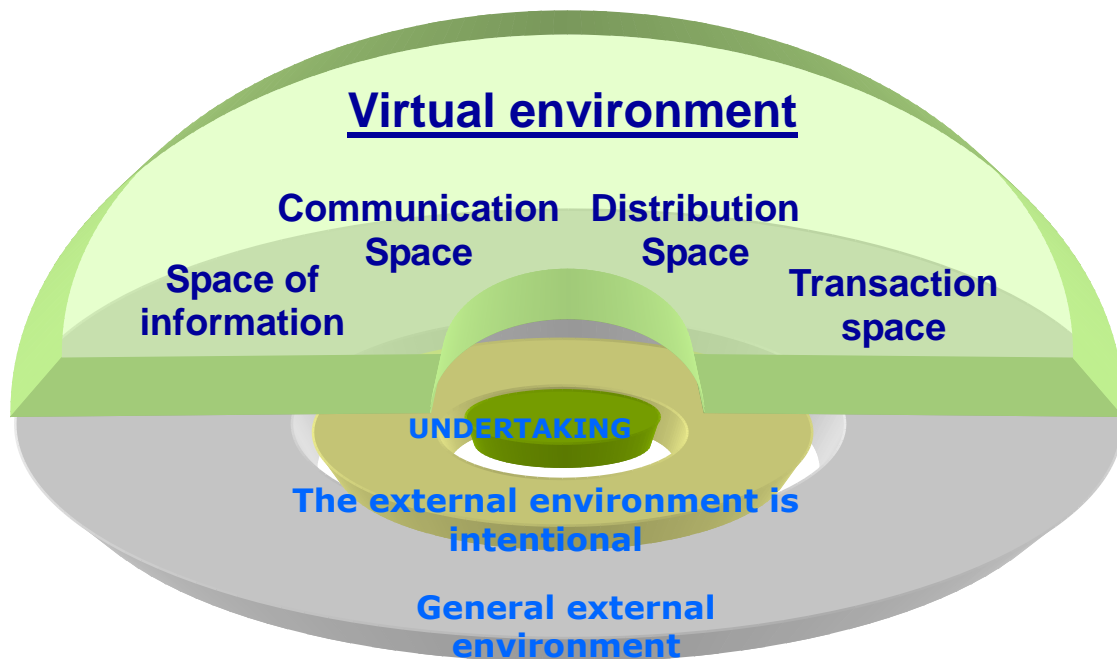


Fig. 3. The external environment of the enterprise, taking into account the virtual environment  
Source: author

#### 4. SILENT KNOWLEDGE OF EMPLOYEES

Research has shown that apart from knowledge undergoing management processes, there is also a significant area of “hidden” knowledge, which remains largely unused by the enterprise. This is the employees’ own knowledge (Fig. 5), which under certain conditions can be obtained or lost by the company.

The management, manufacturing and information processing system were analysed. In the process of each of the above-mentioned systems, there were two types of existing knowledge, that is, employee's own knowledge and documented knowledge as well as knowledge kept by the employee who does not share his knowledge or skills with his employer. Extended studies of this last type of knowledge allowed to estimate the balance of loss and acquisition of employee’s own knowledge (Fig. 5).

This part of employees' specific knowledge was analysed in the three systems mentioned above and in two other significant areas in which the company's management system has significant impact, particularly during recruitment of employees and in the area of acquiring knowledge from the external environment. The results of this analysis are presented in Table 1, where the process of acquiring employees’ own knowledge is clearly visible through



various management methods such as compliance of competences with the position, employee activation strategy, designated fields of activity, management decentralisation, motivation system, open innovation, competency management, internal communication system, controlling, implementation of quality systems, process management, integration and open discussions, workshops, training system of company's new joiners and training materials, including published and non – published materials.

The balance of loss and acquisition of employees' own knowledge presents a heterogeneous picture. During the recruitment process, employees are sought for specific job positions where job ranges are defined. In the case of management members, more knowledge is obtained from the employee when competence complies with the position, while in the case of employees, the balance sheet is negative (more employees' own knowledge remains unused). The new employer usually does not ask for knowledge, but only checks if he has the knowledge he needs. In this way, the additional knowledge acquired by the employee before is not subject to the transaction related to current employment.

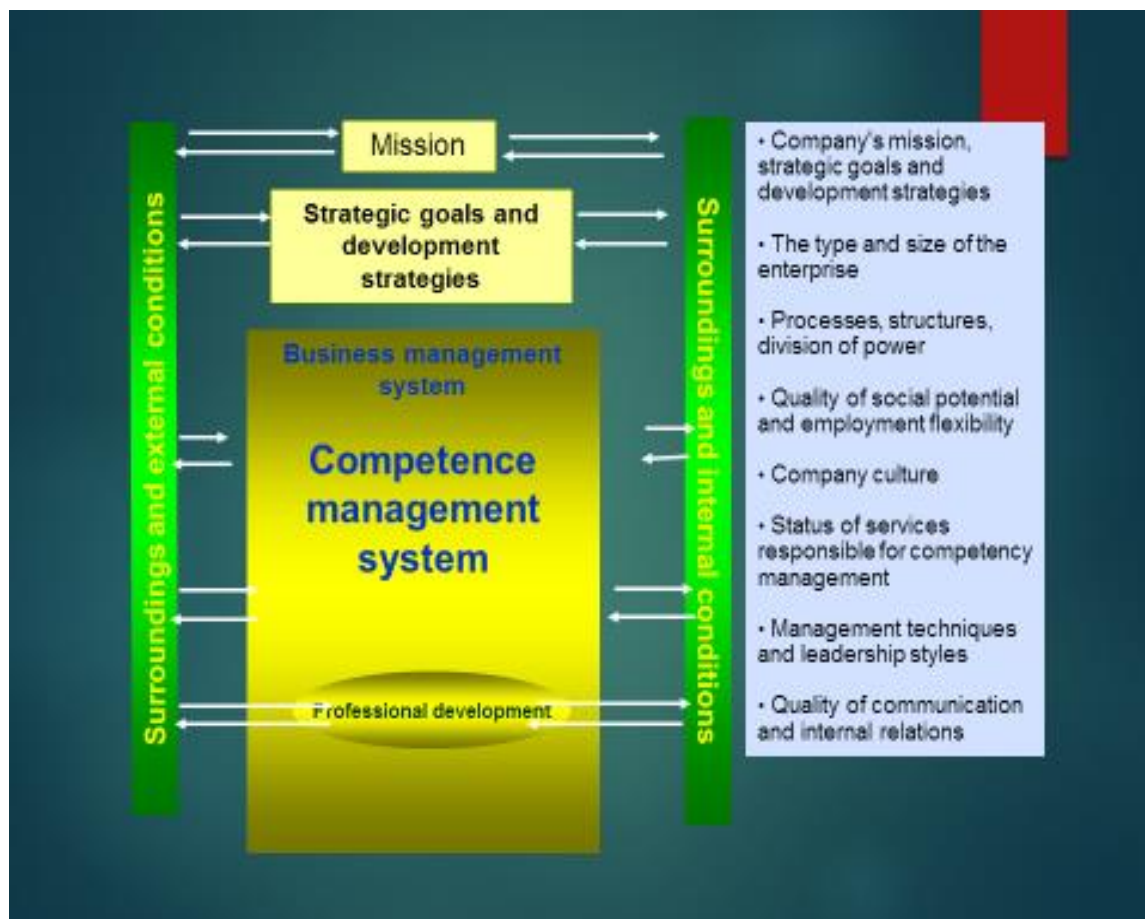


Fig. 4. Place of Competence Management System in an enterprise management system  
Source: author

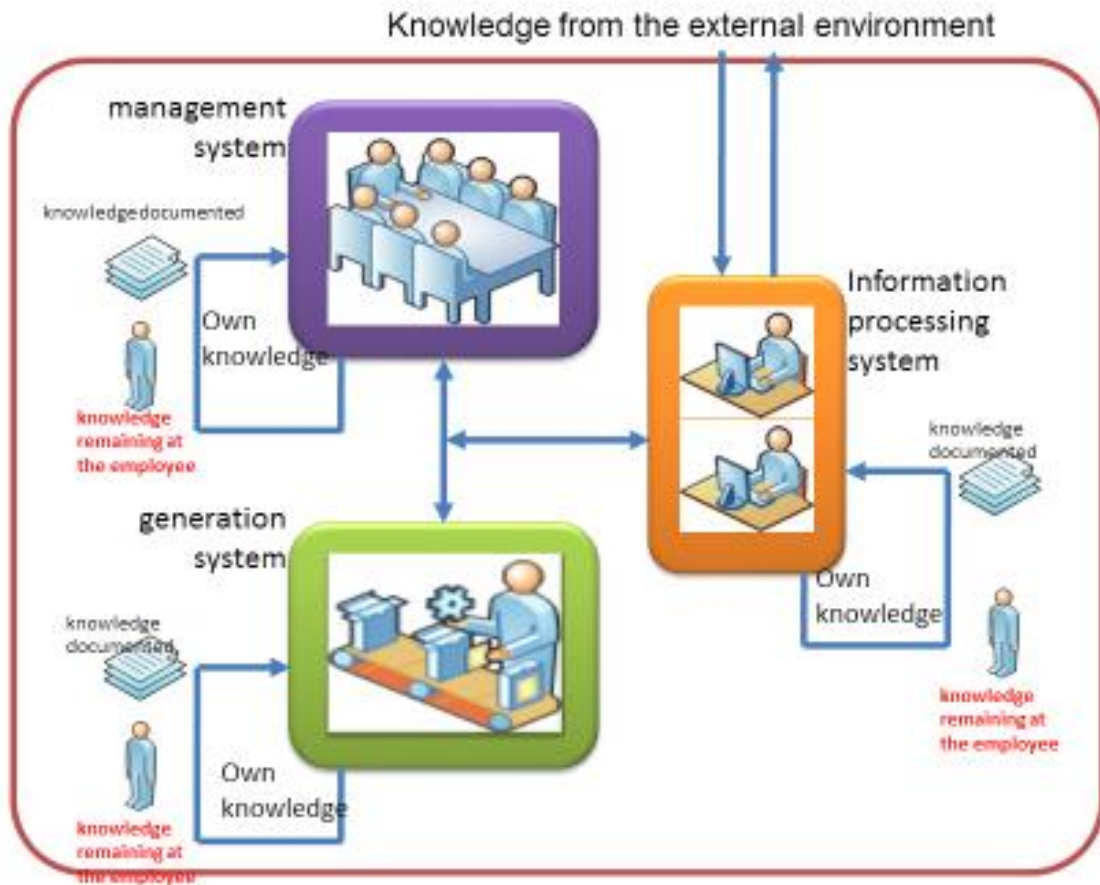


Fig. 5. Share of knowledge in industrial processes  
Source: author

The second area where the balance of loss of employees’ own knowledge can be defined as unfavourable is the type of knowledge that is derived from the external environment both by the employee and by the employer. Previous management practices in the form of integration meetings or open discussions do not ensure that a large part of the company’s knowledge remains available to the employee. The company acquires more knowledge by imposing an obligation to educate young employees, and in developing areas through obtaining publications and unpublished works, often in the form of manuals or handbooks.

Tab.1

Balance of loss and acquisition of the employee’s knowledge.

| The scope of knowledge           | Loss of knowledge% | Acquiring knowledge%         | +/- % |
|----------------------------------|--------------------|------------------------------|-------|
| Knowledge brought by an employee | Management members | Compliance of competences 70 | +40   |
|                                  | 30                 | 20                           | -10   |
|                                  | Directors 30       | 10                           | -40   |
|                                  | Employees 50       | Activation strategy 20       | }+20  |
|                                  |                    | Activity areas 10            |       |

|   |   |   |       |
|---|---|---|-------|
| Management system                       | Management members 20<br>Directors 40<br>Employees 40   | Decentralisation of management 20<br>Motivation system 40<br>Open innovation 20<br>Competence management 40           | }+20  |
| Information processing system           | Management members 30<br>Directors 20<br>Employees 5  | Internal communication 40<br>Controlling 30<br>Computerisation 25   | }+20  |
| Production system                       | Management members 40<br>Directors 20<br>Employees 10   | Process management 50<br>Quality systems 40<br>Quality trainers 30  | }+30  |
| Knowledge from the external environment | Training 40<br>Self-education 50<br>Acquired information 50<br>Experiences 30<br>Personal contacts 70 | Integration meetings 20<br>Open discussions 30<br>Training of new employees 70<br>Unpublished works / publications 50 | } -70 |

Loss of employee's knowledge in the field of training is related to the company's financial losses. Such investment in an employee remains only as the company's costs. The employee returns from the training and nobody expects anything from him, and yet he could pass on the acquired knowledge to other employees or transform this knowledge into innovative ideas.

The employee's knowledge also results from his personal contacts, self-education or information gathered directly from the environment. In this case, the loss and acquisition balance is negative as well. Research has shown that only a few employees, in a well-managed company, could notice the use of the so-called "advance knowledge" for the needs of the enterprise.

## 5. CONCLUSION

The challenge of modern industrial management is to acquire intellectual resources and creative staff that increase the value of the company in a non-investment manner. Because of the growing link between industries and services in many aspects, unilateral promotion of the service sector is not a suitable strategy to stimulate collective growth and employment. The results of this research illustrate the fact that these services, which show an above-average growth (services connected with enterprises), directly depend on the production demand and the employees' competencies. Technological innovation consists of the introduction of new production methods, new ways of implementing services and the adoption of new organisational order in the domain of production processes or services.

The mutual relations of industrial enterprises and service providers also play a significant role. Between them, there is not only the exchange of goods and services but also the transfer of knowledge. It can be assumed that in sectors of the economy where there is intensive cooperation between producers and service providers, a much greater amount of new knowledge is generated than the other ones. However, we encountered a significant amount of unused employees' own knowledge that is not shared with co-workers or employer

everywhere. The greatest loss of employees' own knowledge concerns knowledge gained from the environment in the form of training, self-education, acquiring information, gaining experience and obtained through professional contacts.

Technology transferred through training and transfer of know-how is measured by the costs of resources used to carry them out. Payments for technology are provided in the form of royalties (for example, for copyrights) and license fees with a systematic increase since the eighties and intra-firm trade between parent enterprises and their foreign subsidiaries showing constant development.

Enterprises use many solutions that support knowledge management by participating in management operational systems, such as employee competency management, employee activation strategies, computerisation, quality systems and motivation systems. The innovation rate defines the share in the surveyed population of industrial enterprises that introduced technical innovations over a 3-year period.

However, research has shown that the balance of loss and acquisition of employees' own knowledge is still negative, which means that current management practices are not sufficient, there is no focus on the so-called "advance knowledge", which is located in the intellectual capital of employees. Only the management of intellectual capital that creates the conditions for greater acquisition of this type of knowledge.

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