The investment into information and communication technologies within perspective of organizational sustainability

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Abstract: The economic crisis has been considered as both the main cause and the consequence of current business environment. We aspire to bring principles of national and international level closer to the level of knowledge management, as that is what business units should do in order to secure own etrepreneurship sustainability and thus, contribute to overall development of national economies. For the organizational management we try to emphasize the importance of both internal and eternal information. Within the sustainability prospective, we believe in important role of investments into ICT, especially in problem solving processes. This papers defines sustainability on the level of knowledge management, introduces managerial expectations of ICT tools, specifies functions of ICT within management processes and identifies seven basic organizational resources. The final chapter brings to readers attention funcion of knowledge, unfortunately, frequently overlooked in problem solving.

1 Introduction

The main goal of this article is to draw on the importance of investments into ICT within perspective of sustainable development of enterprise. If a business can be looked at as a system, then information participating in the system plays an important role in it. The information transmission via ICT speeds up not only decision making processes, but also communication flows and at the same time shortens process of recipients' knowledge gathering. In such a case the most crucial role of ICT is transmission of information. „The goal of information is to remove or eliminate entropy (uncertainty) within decision making" (12), finding solutions to tasks and problems of both individuals and groups. „The information can be viewed as data complemented by certain importance according to recipients knowledge" (1). Within perspective of sustainable development, such information has a key value for the organization long term, in particular.

One of many definitions of sustainable development says that it is „target-oriented way of development of human society, which generates and harmonises economic and social progress with a full protection of the environment" (9). This belief can lead us towards definition of sustainable development of the enterprise understood as sustainable development occuring on the lower (organizational) level. The sustainable development of the enterprise is a purposeful activity creating internally balanced economic and social system, which protects the environment and effectively manages all enterprise resources. As well as at the transnational level, at organizational level we distinguish among three pillars: economic, social and environmental.

Information communication technologies have several important functions within sustainability development. This paper discusses these functions and introduces basic organziational resources that need to be effectively

managed. It also stresses the importance of investments into ICT as it has been proved to be crucial for the organization performance.

2 Sustainability development of the organization

The basic goal of economic organizational activities is profit maximization. This is achieved by reducing costs and increasing revenues. On one hand, social policy support economic activities, because it creates satisfied and motivated employees. On the other, it contributes to costs increase, such as those related to salaries, variety of benefits, or paid vacation. Similarly, environmental protection generates costs. Renewable sources of energy, environment-friendly cars or simple sorting of waste creates additional costs, loss of labor work time, etc. Therefore, sustainable development of businesses is associated with long-term profit maximising, social policies supporting motivation of employees to higher labour productivity, environmental protection and effective management and allocation of company resources.

However, harmonization of economic and social objectives, is a difficult task, for example, similar to resolving a problem of economic growth and sustainable consumption. A number of economic and social objectives set in a mutual relation create a certain system of which complexity keeps growing by adding other objectives in order to protection the environment, effectively manage company resources, etc.. In order to achieve the main goals, companies use set of 'purposes' – lower objectives, strategic and tactical plans, programs, commands, tasks, and so on. All of it is executed with a certain necessary number of employees, who have a firm place in this complex system. That place is clearly defined in the organizational structure as a post through which the organizational communication flows and it is that specific post's responsibility to direct communication the best way towards fulfilling the organization objectives. The system at this point is characterized by extremely high level of complexity.

In addition, the memory capacity of an employee is limited, thus leading to natural sorting and filtering of information, forgetting and -- without the use of ICT to extremely limited mutual sharing of information within the organization. With respect to sustainable development a common approach withouth ICT support would probably succumb to described drawbacks and the company would reach its set goals with difficulties, if at all.

However, ICT have become a common corporate standard. It is known that investments into information technologies contribute to productivity increase at work (see Kelemen (5) and Tiruneh (10). Investment into the transfer of information reduces time to get to the user and, if necessary, can also help to forecast further development. According to defined rules, it selects the flow of information to the user who should not lack any information from either internal or external environment. Just the opposite: Continuously growing information pressure is requiring more and more sophisticated technological and software solutions, which in combination with human interaction get converted into knowledge. Knowledge gained this way may become the engine of overall organizational development. ICT should, therefore, provide users with current (up-to-date) information about implementation of sustainability development objectives so that they become a part of balanced system of company goals.

3 Expectations of managers related to ICT

"The managerial expectations of ICT include economic, fast, and well placed delivery of needed data. It should allow for doing the old things new ways and above all, for doing new things" (11). It is a general requirement that managers need to resolve tasks and the subsequent problems. The requirement to behave economically means that the price of information system should not exceed the value of transmited information. The information should reach the recipient at the time, when he finds it useful, etc. Data is transformed into information should bring innovative or even completely new solutions.

Conceptually, the text includes terms, such as knowledge, information, data, skills, experience, and problem solving. Instead of clarifying each of those separately, the following diagram describes these concepts as well as their relations, see Figure 1.
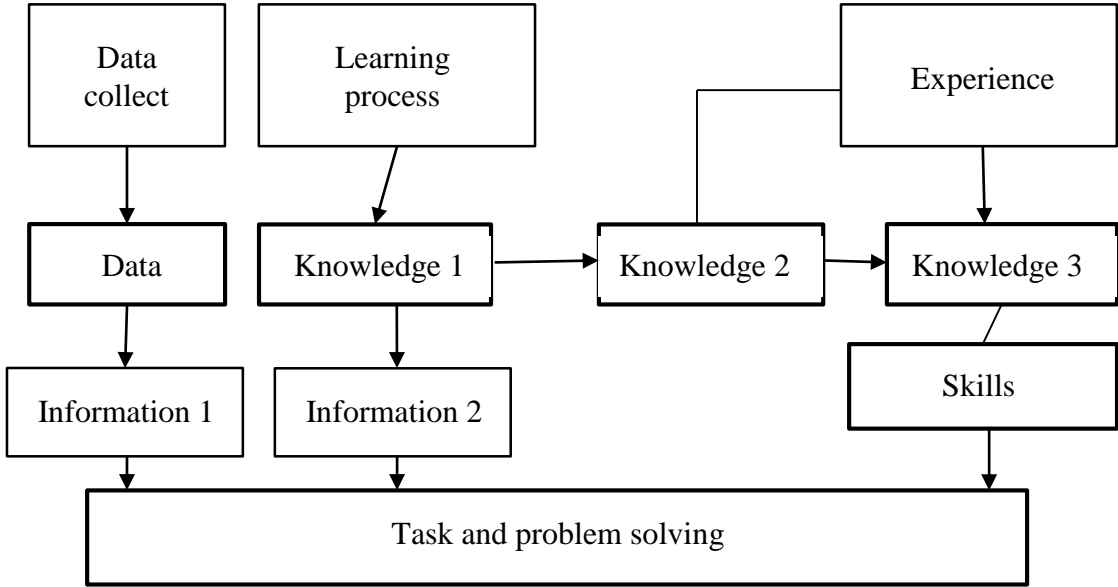
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┌──────────┐   ┌──────────┐                              ┌──────────────┐
│   Data   │   │ Learning │                              │  Experience  │
│ collect  │   │ process  │                              │              │
└────┬─────┘   └────┬─────┘                              └──────┬───────┘
     │              │              ┌─────────────┐              │
     ▼              ▼              │             │              ▼
┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
│   Data   │   │Knowledge 1├──▶│Knowledge 2├──▶│Knowledge 3│
└────┬─────┘   └────┬─────┘   └──────────┘   └──────┬───┘
     │              │                               ┌──────────┐
     ▼              ▼                               │  Skills  │
┌──────────┐   ┌──────────┐                        └────┬─────┘
│Information 1│ │Information 2│                         │
└────┬─────┘   └────┬─────┘                             │
     │              │                                   ▼
┌────────────────────────────────────────────────────────────┐
│                  Task and problem solving                  │
└────────────────────────────────────────────────────────────┘
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Table 1 Structure of information – skills system (4)

There are may ways how to collect data, such as data mining or statistical methods that help to create information. Data may enter into the learning process in which it is enriched by knowledge, thus creating information of higher quality. With the assistance of personal experience, information is transformed into knowledge. The final result should be a personal skill/ability to turn it into activity leading to task and problem solving. If an employee is given a task to solve for which there is a lack of information, basically, there are options of approach:

1. Look at the statistical reports – for ex. graph of production output for the previous month – and on the basis of such information resolve given task
2. If the employee does not fully understand the graph and still needs more information, it is wise to look at graph for other previous time periods and then resolve the task

3. If statistics for the recent three years still does not suffice, the employee should approach his/her supervisor and ask for explanation. Gained knowledge should be combined with own experience and used for task resolution.

3.1 Functions of ICT within management processes

When gathering sufficient amount information, one should consider not only its quantitative aspect but also qualitative value. "The information should be the most accurate, current and reliable. Generally it is recommended that prior to their further processing, one also verifies credibility of the source" (7). As mentioned above, task/problem solving requires to have certain data, information, knowledge and skills. "ICT as a whole allows to collect, store, search, analyze, process, disseminate and exchange data, information and knowledge" (6). These features of ICT far exceed human limits, which is the reason why information communication technologies have become an integral part of the management process.

3.2 Basic organizational resources

There are many available additional resources that companies use in order to successfully manage their entrepreneurship activities. So far, the prevailing part of our attention has been paid to information sources. They play an important role, which may, at first glance, seem even more significant than the role of human resources. However, that is not true. Even the scheme shown in Figure 1 shows that the human factor is essential. The transformation of knowledge on the basis of experience, creation of knowledge and consequently - skills necessary to handle problems in current companies – are still within the human domain. Therefore, human resources keep indispensable place in the company, which does not become affected by degree of business processes automation. That (business process automation) only expands the capacity of human resources by information resources.

For completeness it is necessary to also mention other corporate resources, such as "relations with stakeholders, organizational resources (organizational culture, brand, reputation, etc.), natural resources (geographic location, property, etc.), financial resources and legal resources" (3). For better clarity Figure 2 shows them all under 'basic business resources' heading.
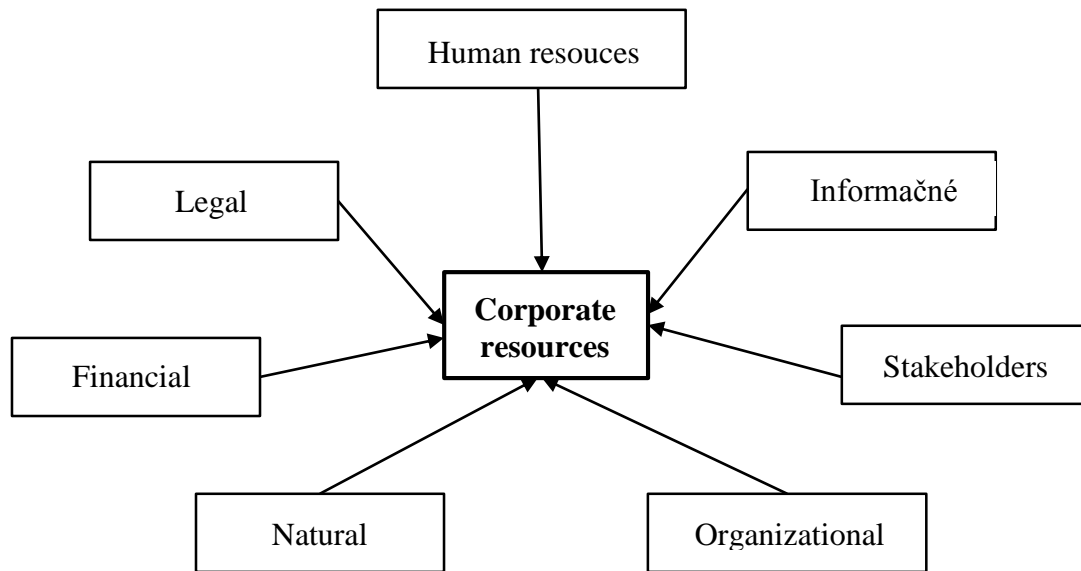
Figure 2 Basic business resources

4 Underestimated knowledge

Corporate goals, including goals of sustainable development, such as economic, social and environmental, constitute a major set of corporate objectives. Besides awareness and knowledge of corporate goals, tasks and problem solving requires distinguishing between doing right things and doing things right way. The difference says that it is not enough to solve the problem; also, it needs to be exactly determined. The exact determination of the problem must always precede its proper solution. Otherwise, we would solve the problem, however, we would not meet the real problem resolution.

Therefore, the right problem solving in the common practice, is not sufficient, even in cases, when an employee is heading towards set business objectives. The employee needs to have exceeding knowledge and that is awareness of the fact that "a significant, although in the practice often overlooked part of knowledge is the objective of a problem" (2). Every employee in the company should be aware of this as it provides answers to a number of employees comments to situations when they have followed work processes and done all in accordance with company objectives, however, the manager remains unsatisfied. Within this perspective of learning and knowledge gathering, employees did not understand the real objective of problem resolution.

'Knowledge' and 'knowledge' may not be the same. When dealing with tasks and problems, it is necessary for the manger to make sure that employees have all necessary knowledge about workflows. They must be familiar with business objectives, which are related to execution of on-the-job activities. Last but not least, employees need to have a clarified goal of the problem being solved and they need to be asked for feedback whether they understood. That needs to precede finding solutions. Only then knowledge contributes to learning occuring in accordance with the expected reality in the organization.

The last expected reality, by which we aim to conclude this contribution, is exposure of the company to the external environment. Within the perspective of sustainable development, where "if a company does not bring through its customers any added value to the system, it (company) becomes useless, harmful and healthy system will try to eliminate it" (8). In such a case, the organization must alarm all its resources. It needs to have such information and skills set, which will be able to respond to all changes of internal and external environment. The set (system) that exceeds limited capacities of human resources, stakeholders, organizational, physical, financial and legal resources. The sustainable development of information sources assisted byt continuous investments into ICT can help the organization collect, store, search, analyze, process, disseminate and exchange data, information and knowledge needed for solving almost all of the problems. Suspension of investments into information technology resources at the time of the technological development might make the organization redundant within the system. Therefore, we consider investments into ICT to be an crucial tool helping sustainable development.

5 Conclusion

We discussed the sustainable development of the company, which is, just as well as at transnational level, built on three pillars: economic, social and environmental. In addition, the enterprise must effectively allocate its own resources — human, informational, organizational, physical, financial, legal, as well as stakeholder outreach. We introduced managers expectations of ICT, the output of which was the information-skills system, which we enhanced by quantitative and qualitative characteristics of information. We stressed the indispensable role of human resources in the current corporate environment and through information resources we expanded their capacities for collection, storage, processing, analysis, dissemination and transfer of knowledge within the management process. We have explained when an enterprise becomes redundant, and what should be done if it finds itself in such condition. The recommended solution involves continuous investments into ICT as a perspective for long term sustainable development of organizations.

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