ADAPTIVE CASE MANAGEMENT - A MODERN WAY OF SUPPORTING KNOWLEDGE MANAGEMENT PROCESSES IN AN ENTERPRISE

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Summary: The subject of this article is a knowledge-based company constantly looking for new solutions in its operations. As this management discipline is progressing rapidly, the authors intend to present a new approach to supporting management processes at an enterprise. The first part of the article discusses the practice of knowledge management and sketches the picture of a knowledge worker at a modern organisation. The next part presents a new trend in knowledge support processes, namely Adaptive Case Management. The authors describe the theoretical grounds as well as the opportunities for practical implementation.

Keywords: knowledge management, knowledge worker, Adaptive Case Management.

"The most important, and indeed the truly unique, contribution of management in the 20th century was the 50-fold increase in the productivity of the manual worker in manufacturing.The most important contribution management needs to make in the 21st century is similarly to increase the productivity of knowledge work and the knowledge worker."Peter Drucker, Management Challenges for the 21st Century.

1. Introduction

Nowadays, companies with ample new technologies, qualified staff and a high quality of services provided or products manufactured turn their attention to the knowledge possessed by the organisation. This, in a sense, represents a search for another link in the organisation which will distinguish it from its market competitors. This perspective is correct, as the intellectual potential of organisations is underestimated. Frequently valuable people are not noticed in one company, but once they are appreciated in the next, they give a huge boost to its development, evidenced by patents, unique recipes, methods or new technologies. This is why it is good to know who works for us as well as what competencies and skills they have. It is worth following the words of one of the greatest management thinkers, Peter Drucker, whose ideas will accompany the main theme presented in this article, and realise that "a company is really its people – their knowledge, capabilities and relationships" [3].

2. Importance of knowledge in an organisation

Knowledge management has now become a very popular management discipline. This is due to the conviction that knowledge is something special, or one can even risk saying, exclusive. So a thesis can be put forward that every company would like to be seen to be knowledge-based, while the opposite is not probable. In the contemporary world, we can

observe the growing trend of organisations based on expert knowledge, i.e. built on specialised, well-developed knowledge of a given field which offers it opportunities to achieve a strong and stable competitive advantage. The important information is that the "knowledge management system of a company is made up of many linked elements: activities, procedures and tools. It can be assumed that the necessary components of this system include: the organisational culture, procedures, recruitment system, training system, rules adopted by the company to manage intellectual property rights, rules of communication and decision-making, research and development work, as well as the IT systems used" [4]. When building the structure of a knowledge-based organisation, one should consider the original source of this knowledge.

Knowledge used in an organisation comes from the knowledge and capabilities of the people working for it. It is their work consisting in correctly interpreting information that creates knowledge, which enriches an enterprise, making it better, more competitive and capable of continuous development. Every action leaves information behind it and the correct analysis of this information produces knowledge significant for further operation. This is a reflection of the common saying that we learn from our mistakes. This perspective of an organisation for which the source of knowledge consists in the people creating it, can be considered a creative factor, a motor driving it to get even better, closer to perfection and unequalled.

This idea is confirmed by many publications of P. Drucker and A. Toffler, who agreed that knowledge is "the only important means of production". Elaborating further on this subject, Toffler stated that "knowledge is the richest source of power and a key to gaining it, its core".

Providing the appropriate knowledge becomes the key element of every process, both in production and service provision. The organisation's success is founded on information, which, when properly processed, turns into knowledge used to perform work. Nowadays, nobody can function without having knowledge of the field in which he/she tries to specialise. Knowledge is undoubtedly the most desirable "resource" of organisations. Many methods have been developed for mining data so that it is as useful as possible, so that it meets the analytical needs of enterprises intending to use the data they possess to continuously improve the effectiveness and reliability of products manufactured or services provided. Various approaches to knowledge management are distinguished, but the first step for an organisation is to realise that the knowledge it possesses is of utmost importance for it, constitutes its weaponry in the market, allows it to gain competitive advantage, generate profits and at the same time forms the foundation on which the enterprise builds its strategy.

However, there are some concerns about the quality or reliability of the information received as well as the ability to process it. This problem exists because in the world in which the Internet has become such an important medium in the process of obtaining information from data, the information that is significant has to be skilfully selected so that after a synthesis process it would provide valuable knowledge for the organisation. In order to more easily and optimally apply the information possessed, IT companies and scientists are vying with one another to develop new tools supporting knowledge management. These methods are based on information technology. They cannot replace the human mind, but they can support human work by generating, codifying and transferring knowledge. The main requirements for such systems include [2]:

- supplying up-to-date, comprehensive information,
- ensuring a selective and effective use of information and its exchange between

units as well as the ability to obtain data and information without delay,
- ease of use,
- information flow and feedback.

Apart from IT systems, another important link consists of the people working for the enterprise, who participate in building the entire organisation, its systems and, what is important from the perspective of this article, also its knowledge management system.

3. Knowledge worker

Knowledge workers are members of an organisation who perform their work using their mind more than manual skills with which knowledge is inseparably connected. This term was coined by Peter Drucker in 1960. He believed that these employees "possess *high levels* of education and/or expertise" and the job they have in an organisation is to create, practically use and disseminate the knowledge they have.An additional strength of those workers is their ability to combine substantive competences with intellectual ones, as a result of which they can develop solutions not yet used in the areas of production, technology and also organisation. Thanks to knowledge workers, an enterprise becomes the owner of the greatest 'means' of production, namely knowledge. Such transfer is possible due to qualified staff composed of specialists in a given field.

Knowledge workers do not like strict controls, they need autonomy to work. While contributing intellectual capital, they need freedom in executing the work entrusted to them. Peter Drucker believed that leaving complete autonomy to employees was rather risky, so he supported minimum control, but thought that some risk had to be taken so people could define their own ways of executing tasks.

To better illustrate this problem, it is worth quoting an idea formulated by M. Strojny, Ph.D., here: "In an industrial society, the worker needed the capitalist to survive and support his family – in a knowledge-based society it is the enterprises, if they wish to remain competitive and keep developing, that must attract the best employees and provide them with conditions that would discourage them from working for the competition" [4].

In the latter type of society, the employee becomes the supreme asset that can strengthen an organisation. Skilfully introducing the employee to the enterprise's affairs and providing them with the conditions for working most effectively and making something extraordinary of their work should now be the priority task of every manager. This changed view of the employee does not concern management only: if knowledge workers want to function in the labour market in the long term they must learn continuously. Life-long learning is also a part of the framework of a knowledge worker. A learning organisation needs people who can create this learning, new experience and ideas in it and will use them in operations. This situation is caused by the changing professions and functions, less and less job security, and what is more, "a job becoming a task, and not a place for performing actions" [9]. The role of creative thinking and group work is increasing, so it is becoming necessary to manage one's own time, health and career. It is also necessary to constantly disseminate knowledge.

From the point of view of the organisation's knowledge, the ability to use the existing knowledge support tools is important because it enables the experience of all employees of the enterprise to be utilised. What is more, one can claim that today, almost every employee uses their intellectual potential in their everyday tasks, and uses a computer to perform their work. This situation has led to the development of many IT tools supporting people's work, which will be discussed in the following chapter.

4. Adaptive Case Management

In recent years, companies have focused their activities on implementing systems supporting enterprise management, such as Enterprise Content Management (ECM), Customer Relationship Management (CRM) or Business Process Management (BPM). This was mainly aimed at more efficient process handling, improving the planning capability, improving accounts payable management etc. The majority of predictable processes have been automated using computer technologies. Yet there is a problem with processes whose occurrence cannot be foreseen or programmed – and these require knowledge workers to intervene. Thus a need appeared to support these workers, allowing them to use their capabilities more effectively to improve their productivity and customer satisfaction, and this also boosted the workers' satisfaction with their work. The most frequently used tools allowing employees to transfer information about a given problem used to be verbal communications and e-mail. In order to fill the gap that appeared in systems like ERP or BPM, the concept of Adaptive Case Management [7] was formulated. In terms of process complexity and unpredictability is has been compared to other IT systems supporting management, as presented in Fig. 1.

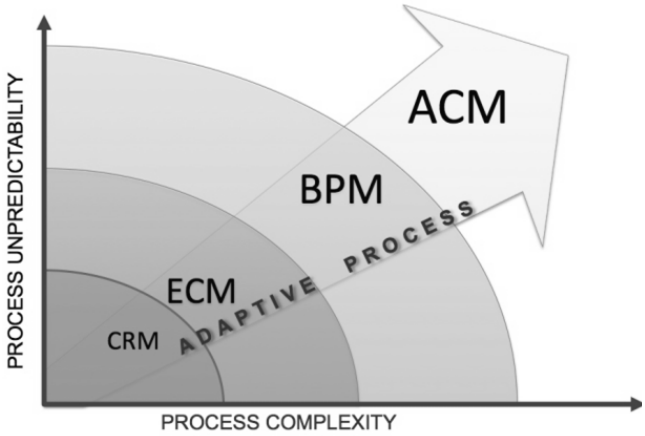

Fig. 1. Functionality of adaptive case management

Case management is defined as a comprehensive combination of work, content management, business rules and cooperation support tools that allow the business process to be completed. In other words, it is a combination of tools that supports the case process from start to finish (end-to-end). Case management integrates tools supporting the execution of a knowledge worker's tasks by acquiring data from external sources. It is a tool that collects information both in the form of data (files, documents) and the context of the decisions and actions taken, and shows audit trails or meta-data (for example), thus contributing to simpler, faster and therefore also more effective database management. So far, BPM/CRM/ERP systems have been designed to support processes and decisions being taken, but ACM allows the employee to create certain rules by reference to the database of previous cases, which represent the best practice. This makes it possible to minimise repeated work thanks to system information about a similar phenomenon and the suggestion of the best solution [8]. In this context, the opportunities for control should be considered, because as Peter Drucker said, giving an employee unrestrained freedom to create rules may be a risky move.

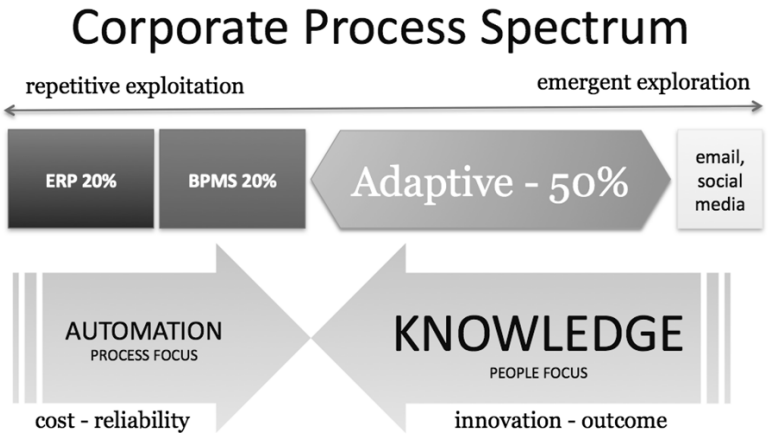

Fig. 2. Enterprise process stream

Adaptive Case Management allows the characteristics of BPM, CRM, ECM and project management to be combined.

ACM provides users with a tool allowing them to execute knowledge-based work which was not supported by previous systems for many reasons (the processes were too dynamic, variable and unstructured). Managing a case end-to-end took too much time both for the customer and employees due to a number of external factors, such as: resources, incomplete information, no standardization, difficulties with enforcing action compliant with the policy, rules and best practice, no access to key information about the current status of the process and previous actions [7]. Employing the ACM concept can bring benefits in the form of a significant improvements in running processes which have so far been supported only by tools such as e-mail, as shown in Fig. 2. There are still about 50% of processes (requiring the involvement of an employee possessing the necessary skills) running in an enterprise which are currently executed without any use of systems allowing their automation. The case management scheme need not be based only on an expert's assessment or business rules. Some tasks and processes necessary to complete the case can be predefined by creating case templates. ACM becomes an invaluable tool supporting processes which [6]:

- are unpredictable in their execution,
- are driven by the occurrence of unforeseen events,
- require executing, but their consequences are unpredictable,
- require the ad-hoc involvement of new employees,
- are characterised by unknown input and output variables,
- require rules to be created by employees in every instance,
- need secure and verifiable interactions between knowledge workers,
- require transparency and auditing.

ACM allows business actors to strengthen the safety of all people involved in the production or sales process, regardless of where they are. It should be kept in mind that both the producer and the customer have certain goals to achieve, and if the adaptive case

management concept is applied, these goals increasingly converge, as shown in Fig. 3. This is because ACM is also a platform on which tasks that are qualitative, unique and require special skills can be finalised to the mutual satisfaction of the parties. As a result, the enterprise can maintain customer loyalty and satisfaction.

Fig. 3. Area in which adaptive case management works

5. ACM in designing mining works

Adaptive Case Management seems a worthwhile approach to various types of design work. Applying this concept may be particularly right in planning preparatory and extraction works at hard coal mines. This is due to the following factors, among others:

- the specific nature of the mining process design,
- the necessary exchange of experience,
- the need to fill the generation gap,
- the requirement of retaining the knowledge and expertise of employees to retire.

ACM supports developing rules that would allow the management to obtain knowledge from the experience of employees who no longer work for the enterprise, but whose intuition and proficiency in mining works is inestimable.

One example of the idea of applying adaptive case management is the advisory system being developed to support preparatory and extraction work planning at hard coal mines which consists of the following components: [1]:

- a knowledge base,
- a knowledge acquisition module,
- a reasoning module,
- an interface allowing the user to interact with the knowledge base.

This system is to help engineers designing production preparation at hard coal mines select the right equipment for the mining geology conditions of planned headings, combining mining machines into long-wall systems; determining the characteristics of mining results in planned headings. The designed system, which will constitute an innovative solution allowing knowledge about mining works executed in the past to be utilised, seems to be a great tool in which ACM may play a significant role.

6. Summary

Companies use information technology to support internal and external processes more and more effectively , as a result of which a need arises for a more effective management of

processes whose occurrence cannot be foreseen at the design stage. An employee possessing the appropriate knowledge, qualifications and skills plays a significant role in creating company value as his/her knowledge as well as creativity allow problems not encountered before to be solved. Cooperation between employees, knowledge sharing and learning should become a part of a system, and not just be left on paper, in e-mail or verbal communications. Adaptive Case Management is an approach whose implementation will make it possible to significantly streamline the communication between employees and the knowledge transfer. It will also facilitate more efficient and faster problem solving. Formulating rules at the problem-solving stage will allow other employees to receive valuable information as well as a model procedure allowing the case to be processed from start to finish in the best way. ACM can become a noteworthy supplement to integrated management systems, allowing the employees of not just the same unit, but also of ones hundreds of kilometres distant, to acquire knowledge and expertise, thus allowing the company to improve its operations, and making the apparently unnoticed, but valuable employee an important link in the organisation.

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