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MODELING OF KNOWLEDGE MANAGEMENT PROCESSES IN IT OUTSOURCING PROJECTS

Summary: The author presents the complexity of activities and tasks, related to the transfer and transformation of knowledge in IT-related outsourcing projects, in the form of graphical models and detailed account of the most important aspects of knowledge management in outsourcing projects. Core competences and organizational needs in the IT area are defined, with delineation of key personnel involved in proper management of the outsourcing relations and their respective roles in "knowledge processes". Selected processes of knowledge and information management in IT outsourcing projects are illustrated in the form of process maps.

Keywords: outsourcing, knowledge management, information and knowledge transfer, knowledge processes, process maps.

1. Introduction

The significance of outsourcing is growing at a steady pace, particularly in the aspect of information technology tasks. The scale of outsourcing is expanding, covering various areas of organizational functioning, resulting in steady departure from traditional structures towards networking, largely virtualized and based on advanced technologies of information processing and communication. "The technological revolution, by providing new capabilities in respect to business virtualization, has changed the character of work, but has not yet been successful in replacing the previous principles of management" [Warner, Witzel 2005, p. 20]. The most important focus of the management process is still the human factor, i.e., people that fulfill various functions within the organization.

Information processing, including IT outsourcing, can be an interesting area for further research, since they employ two most important components of the knowledge process, namely human resources and information technologies. IT projects are carried out under significant pressure resulting from external signals (such as technological advancement or legislative changes), time and budget limitations and elevated customer expectations. On the one hand, the technological base of the IT sector is evolving and changing at a most dynamic pace; on the other hand, it is extremely difficult to adapt the pace of such changes to the existing solutions as well as to the knowledge and skills of both technical personnel (IT specialists), and

end users of IT systems. The above features of IT projects also affect the stability of project realization, particularly in the face of new organizational forms introduced on the market, involving partial or complete virtualization of operational environment [Wojtkiewicz-Wydra 2010, p. 42].

The effective management of IT outsourcing cooperation requires qualified personnel with suitable skills and knowledge. On the other hand, **knowledge management in outsourcing projects**, which to a great extent overlaps the outsourcing cooperation management, **may be defined as identification and coordination of processes that influence: knowledge localization, knowledge development, knowledge exchange, knowledge utilization and preservation of knowledge related to carrying out the outsourcing process, based on the use of properly selected methods and instruments and intended to facilitate completion of the outsourcing goals as well as extending of organizational knowledge.**

This paper aims to demonstrate the complexity of activities and processes involved in the transfer and transformation of knowledge in outsourcing projects related to the area of information technology. It attempts to indentify key subjects in outsourcing relations, their respective roles in "knowledge processes", as well as the course of selected processes related to identification, transfer, creation and protection of knowledge in outsourcing undertakings. The notion of knowledge management in this paper will be used in the context of: intellectual capital management, information management and information access, as well as managing the knowledge of processes involved in IT outsourcing. The considerations will relate to selected undertakings of strategic significance for the organization. Furthermore, the considerations presented herein will be limited to contractual relations, due to the fact that contractual outsourcing is the most frequent form of outsourcing relationship in IT-related projects.

2. Identification of organizational knowledge resources

The stage of identification of organizational knowledge resources involved in outsourcing requires, in the first place, identification of core competences, which – in turn – significantly impacts the optimization of outsourcing decisions. Outsourcing of core competences may prove suicidal, similarly to the failure in recognizing such core competences in the organization [Kłos 2009, p. 91]. Despite this admonition, more and more companies nowadays choose to outsource tasks in the areas that decide on competitive advantage, such as information processing, finance, personnel management or even research and development. In the light of the above, skilful coordination of relations with external service providers is a prerequisite for safeguarding valuable resources and improving the competitive advantage of both parties during the contractual period.

Facilitation of IT outsourcing decisions involves the following activities:
- Determining the requirements (knowledge and skills) for realization and improvement of IT processes/services in the organization;
- Analyzing the potential and feasible range of organizational needs that can be satisfied using internal resources – identification of key personnel for IT-related tasks, determining competence gaps, overview of IT technology, systems and tools used in the organization;
- Determining the impact of IT on organizational functioning and identifying the IT outsourcing risks involved (such as the risk of core competence loss);
- Planning the involvement of key IT personnel in the realization of the outsourced tasks (to safeguard the organization against the loss of organizational knowledge resulting from key personnel outflow);
- Designing changes related to IT outsourcing, in the form of outsourcing realization scenarios;
- Determining potential barriers in the course of IT outsourcing implementation (staff resistance, unanticipated costs incurred in the outsourcing preparation phase, organizational problems, barriers resulting from implementation of new technology, legal limitations, communication problems, etc.) and potential methods of alleviating such barriers (e.g. involving the HR department in organization and implementation of activities designed to limit the negative impact of outsourcing on IT personnel – such as supplementary training to improve the skills and knowledge of the personnel relegated to the outsourcing company, developing efficient communication as a key factor in limiting the staff resistance to changes, or even considering the involvement of external consultants);
- Analyzing the cost of carrying out IT tasks using internal resources against the cost of outsourcing the tasks to external providers;
- Analyzing the maturity of IT service providers market (Does it offer services required by the organization? Do the IT service providers have sufficient experience in implementation of such services based on the outsourcing principles? Are the services required by the organization monopolized by a single provider?);
- Determining whether the organization will be able to effectively monitor and coordinate the cooperation with external service provider (Can it effectively define the range of outsourced processes/services and their respective evaluation measures? Is it able to define the agreeable level and quality of such services? Is there anyone in the organization who, based on personal competences and skills, may properly evaluate the quality of the services against the measures defined in the contract? etc.).

The above activities may be supplemented by a range of instruments designed to suit particular needs and limitations of the organization. These may include matrices for evaluation of core competences (Table 1) and matrices for evaluation of service outsourcing susceptibility (Table 2). In the initial phase, the organization should

identify all services carried out by the IT department and proceed with evaluation of their quality against the criteria provided in the matrices. Matrices presented in Tables 1 and 2 may be supplemented by additional criteria to help the organization verify its knowledge of the areas under study.

The analysis of organizational resources and needs in the IT sphere may be carried out internally, contracted to a third party consulting company or relegated to a potential service supplier. The latter solution, although observed in practice, is burdened with considerable risk. The potential service provider may be tempted to exploit the unawareness of the purchaser to sell superfluous services and functionality features.

Table 1. IT core competences evaluation matrix

IT service/ process	Appraisal of own knowledge and skills related to the IT service/process	Appraisal of suitability of existing technology/tools related to the IT service/process

Postulated appraisal scale: 1 – low, 2 – adequate, 3 – good, 4 – outstanding.

Source: own research.

Table 2. IT outsourcing susceptibility evaluation matrix

IT service/ process	Outsourcing susceptibility appraisal	Appraisal of the maturity of outsourcing services market in relation to the IT service/process	Preference in realization of the IT service/process (outsourcing/insourcing/in-house servicing on the same base as before)

Postulated appraisal scale (columns 2 and 3): 1 – low, 2 – average, 3 – high.

Source: own research.

The choice of IT service option should be based, in the first place, on the organization's intent to "relegate" certain services (outsourcing susceptibility evaluation) and market potential to provide such services, coupled with maturity of potential outsourcing partners.

3. Distribution of roles in the IT outsourcing management process

The organization intent on outsourcing selected IT services should commence with establishing an IT outsourcing taskforce (team), with a direct involvement of the following staff members (own research based on [Cullen, Willcocks 2006, p. 91]):
• Director – responsible for general control over the cooperation with the service provider,

- CIO (Chief Information Officer) – responsible for financial management and IT systems,
- Contractor Manager – responsible for safeguarding the contractual agreements between the organization and the service provider,
- IT Manager – supporting the tasks relegated to Contractor Manager and directly involved in everyday operational tasks, with special regard for technical tasks,
- Other personnel – representatives of the HR division, finance department and IT service recipients, whose involvement and opinions on the implementation of the outsourcing project may directly influence the effects of the contract.

Similar taskforce structure should be present on the part of the service provider, involving key personnel with direct influence on the course of the cooperation. These include:

- Managing Director – responsible for supervising the cooperation and financial matters,
- Finance Manager – responsible for comprehensive, strategic relations with the client,
- Customer Relations Manager – responsible for satisfying the contractual quality of service as defined in the SLA (Service Level Agreement),
- Servicing personnel – responsible at the operational level for all matters regarding technical, logistic and organizational tasks, including the service concordance with the SLA,
- regular communication, reporting and working meetings,
- supplementary tasks related to servicing,
- maintaining the Information Repository on communication with the client, well as stockpiling running documentation of services rendered and making it available to the authorized representatives of the client.

Exercising the above roles, which in practical application may be allocated to smaller teams, should warrant proper execution of IT outsourcing activities or even, in some cases, increase the effectiveness of the process. The previous knowledge of the personnel, as well as knowledge gathered in the course of the outsourcing process may largely influence the decision-making processes. For example, negative opinions on the level of services rendered – be it system failures, application errors, lack of prompt support in solving current problems – may lead to contract termination or refusal to renew the contractual cooperation with the service provider.

4. Informational needs of actors involved in the outsourcing process

For the outsourcing project to fulfill the projected requirements, the organization not only requires knowledge indispensible for making informed decisions on the soundness of the outsourcing solution (as presented in the previous chapter), but also a clear strategy of communication between various actors involved in the outsourcing process.

Table 3. Actors involved in the IT outsourcing project, their respective informational and communicative needs and potential methods of satisfying those needs

Internal stakeholder	Issues	Options
Staff	How will I be affected? What are my options? How do I explore them? What assistance will I be given? What is working for a supplier like? When is it all going to happen? What is expected of me now?	– Open forum – Meetings – Newsletters – Counseling – E-mail – Hotline
Customers/ IT system end users	How will this affect service? How can we ensure our needs will be met? Who should we be talk to?	– Liaison groups – Briefings – Newsletters
Human resources department	Which employees will be affected? Who will remain, transferred, made redundant, etc.? What precedence has been set within the organization and by other organizations? What is our role?	– Meetings – Working party – Steering committee involvement
Finance/accounting department	What is the budget for the project? How will the supplier be paid for different services? Will there be interfaces to our financial systems? Will there be any asset sales? What is our role?	– Meetings – Working party – Steering committee involvement
Legal department	What sort of contract will be signed? What are the applicable laws? Will we be using external lawyers to draft the contract? What is our role?	– Meetings – Working party – Steering committee involvement
Management	What are all the options being considered? What are other organizations' experiences? What are our competitors doing? Who are the potential suppliers? What is the bottom line impact and what are other benefits? What risks are present and how will we manage them? What is the schedule? What are the key issues?	– Steering committee involvement – Progress reports – meetings
External stakeholder	Issues	Options
Suppliers	What products/ services are desired? What is the contract worth? How long is the contract? What sort of relationship is desired? Who should we be talking to? What is the timetable?	– Briefings – Site visits – Informal and formal discussions
Media	Who won? How much is it worth? What will change? Will there be job losses?	– Press releases – interviews
Competitors	What are the premises for outsourcing? What tasks are being outsourced? What service providers are potentially considered for the contract? What will happen to the employees?	– Press releases – Interview – Informal relations and meetings of personnel

Source: own research based on [Cullen, Willcocks 2006, p. 47].

It is advisable to prepare a written outline of all such actors (groups, teams) together with their respective informational needs and potential methods of addressing those needs (see Table 3 for an example of such outline).

A well-formulated strategy for "diffusion" of outsourcing information, one that warrants effective and timely access to information for all parties involved in the process, may prove a good starting point for the anticipated change.

Good understanding of the reasons for outsourcing and the range of tasks being outsourced is a precondition for success of the IT outsourcing process. This applies both to the recipient and the provider of the services. However, this may prove problematic in the face of considerable disproportion of knowledge and skills between both parties (this is why some organizations need to employ third-party consulting companies in the process of selection of IT services for outsourcing). On the other hand, it must be remembered that proper definition of the range of services being outsourced forms a basis for further elaboration of contractual details, such as performance measures as well as the range and methods of information exchange between the contracting parties.

Another important aspect of the process, strictly related to the issue of knowledge management in IT outsourcing, is the issue of intellectual property rights (especially in relation to the content authored by the service provider), together with specific procedures for contract termination and transfer of "goods" (databases, know-how, equipment, software, etc.). Any contractual deficiencies in this respect may result in severe disputes, both during the contractual period and after contract termination.

5. The significance of knowledge management processes in IT outsourcing and process modeling methods

Implementation of knowledge transfer and development processes, both inside the organization and in relation to other companies, requires considerable effort on the part of organization management and other actors of knowledge transfer processes. On the one hand, it is essential to secure proper information flow to the outsourcing partner and precise definition of the range of knowledge passed on to the service provider to satisfy the requirements of the client. On the other hand, it is of utmost importance to protect knowledge and information vital for maintaining the organization's competitive advantage and secure the inflow of information and knowledge from the service provider in order to be able to continue operation in a given area after termination of the contract or after contactor change.

The process approach to knowledge management may facilitate the construction of a model that warrants proper level of service provision, while maintaining the organizational ability to extend knowledge and provide security of vital information. Such an approach requires formulation of process maps and determination of actors responsible for individual processes in a given sequence of activities.

The main motivation for formulation and use of knowledge management models in IT outsourcing should be based on the need for comprehensive picture of informational relationships and dependencies that may occur in the course of collaboration with external service providers. Such models may prove useful in the process of determining principles of communication with the outsourcing partner as well as for coordinating the individual tasks. Consequently, such models may improve knowledge access and knowledge utilization in any organization making use of IT outsourcing solutions. Due to the widespread use of knowledge sharing phenomenon – being a result of increased dependence on cross-organizational relationship networks – the need for coping with both beneficial and negative results of this phenomenon becomes increasingly important. It seems that the best method for addressing this need is to formulate a comprehensive model of knowledge management, to comprise various types of relations, both internal and external.

A knowledge management model for IT outsourcing purposes may also be incorporated as a module of an overall, comprehensive model of knowledge management within the organization. Formulation of a knowledge management model for IT outsourcing purposes should be based on proper process mapping. This applies both to processes planned for outsourcing and those that may impact communication between the parties of the outsourcing contract. Such process maps may significantly improve the transfer of knowledge to external service providers as well as facilitate comprehension of operational determinants of individual tasks and early detection of potential vulnerabilities that might impact the efficiency of existing processes. Typically, the process map includes information on the following:
• tasks constituting the process,
• relationships between individual tasks,
and, in the case of more elaborate maps:
• actors responsible for individual tasks (positions or organizational units),
• task implementation mechanisms (such as IT systems used),
• information required for individual tasks (input information),
• information resulting from task completion (output information).

The maps presented below are only simplified examples of tasks in a selected area of IT-related processes that may be considered for outsourcing. The tasks illustrate such key processes emphasized in professional literature as: knowledge localization, knowledge acquisition, knowledge development, knowledge sharing, knowledge utilization and knowledge preservation [Probst, Raub, Romhardt 2002, p. 42].

The modeling examples presented herein are limited to general map of knowledge management processes for distinct stages of the IT outsourcing activities (Figure 1) and a basic outline of the process of *Setting the information security guidelines in contacts with the service provider* (Table 4). The author hopes to continue the research into the subject at hand and provide more advanced models of knowledge management within the scope of contractual relations between the client and the IT service provider.
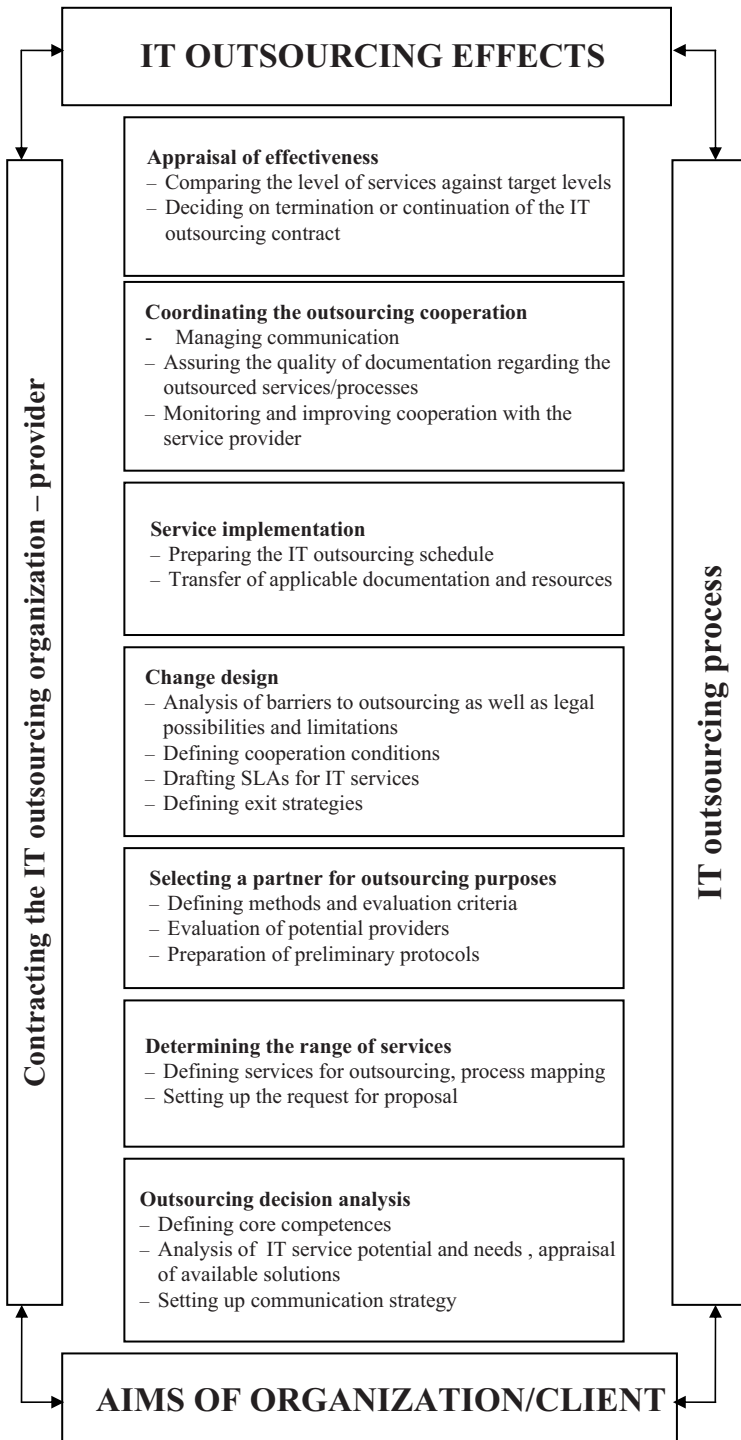
IT OUTSOURCING EFFECTS

Appraisal of effectiveness
– Comparing the level of services against target levels
– Deciding on termination or continuation of the IT
   outsourcing contract

Coordinating the outsourcing cooperation
-   Managing communication
– Assuring the quality of documentation regarding the
   outsourced services/processes
– Monitoring and improving cooperation with the
   service provider

Service implementation
– Preparing the IT outsourcing schedule
– Transfer of applicable documentation and resources

Change design
– Analysis of barriers to outsourcing as well as legal
   possibilities and limitations
– Defining cooperation conditions
– Drafting SLAs for IT services
– Defining exit strategies

Selecting a partner for outsourcing purposes
– Defining methods and evaluation criteria
– Evaluation of potential providers
– Preparation of preliminary protocols

Determining the range of services
– Defining services for outsourcing, process mapping
– Setting up the request for proposal

Outsourcing decision analysis
– Defining core competences
– Analysis of IT service potential and needs , appraisal
   of available solutions
– Setting up communication strategy

Contracting the IT outsourcing organization – provider

IT outsourcing process

AIMS OF ORGANIZATION/CLIENT

Fig. 1. Model of knowledge management processes for IT outsourcing

Source: own research.

Table 4. Process map applying to *Setting the information security guidelines in contacts with the service provider*

Name of the task/ subprocess	Executor	Description of activities
Identifying core information	Organization director in cooperation with internal/external experts	Identifying information/data crucial for the functioning of the organization or maintaining its competitive advantage
Determining the actors responsible for information security within the organization	Organization director	Identifying employees who, based on qualifications and skills, may be appointed to manage information security for the duration of the IT outsourcing contract and to provide security training for personnel working in cooperation with the outsourcing partner
Setting up methods of protecting core information	Information security manager/outsourcing manager	Analysis of the adequacy of existing security procedures and postulating new forms of safeguarding; managing information access rights
Determining location and methods of storing information	Information security manager/outsourcing manager	Designating physical location for core information carrier storage and data storage; data backup
Construing a system for monitoring information processes within the scope of relations between the client and the IT service provider	Outsourcing manager	Determining personnel responsible for monitoring contacts with the service provider and tools supporting the monitoring process; determining mission-critical points for enhanced monitoring, both in the organization and at service provider; determining methods of supervising mission-critical documentation (contract, operational procedures, reports, etc.)
Determining representatives of the service provider responsible for information transfer for the duration of the contract	Director of the service provision company / customer relations manager	Appointing personnel for maintaining communication with the client, based on communication skills and expertise

Source: own research.

Analysis of the postulated maps shows that the organization may undertake a number of tasks of varied complexity to ensure effective transfer of open knowledge needed for proper implementation of outsourced tasks, while simultaneously providing effective security of information related to the contracted tasks. It must be noted, however, that while the involvement of the service provider in the knowledge management process is described here mainly in its "technical" aspects (provision of information in line with predefined operating procedures), practical application

requires also a certain level of trust and effort to build proper conditions of knowledge sharing between the organization and the provider of outsourced IT services in order to facilitate participation of external companies in creation of sealed ("silent") knowledge.

6. Conclusions

This paper emphasizes the role of systematic and far-sighted approach to knowledge management in IT outsourcing projects. The analysis of organizational resources of contracting partners, informational needs and processes of information and knowledge management illustrates the vast number of factors which should be taken into account to minimize the risk of improper "utilization" of knowledge by any of the contracting parties and to provide effective cooperation between partners of the IT outsourcing project.

The most important conclusions that can be drawn from the above considerations include the following:

1. Organizations deciding on outsourcing its mission-critical area of information technology should emphasize proper preparation steps, such as detailed analysis of needs and potential benefits as well as potential risks that may result from this type of organizational change.

2. Modeling of knowledge management processes in outsourcing relations and formulation of process maps (both for IT processes and information/communication processes) may effectively:

- limit the extent of communication problems with external provider,
- facilitate and streamline the implementation of IT outsourcing,
- improve security of organizational knowledge (through proper recognition and protection of core "knowledge carriers", protected access to "results' of the service provision after contract termination, etc.),
- improve information exchange between the organization and the service provider,
- facilitate development of organizational knowledge in the course of the outsourcing contract, both in its organizational (project management knowledge) and technological aspect (of particular importance if the organization plans to restore in-house servicing of the outsourced tasks after contract termination),
- improve the outsourcing process in relation to the overall strategic objectives of the organization.

3. Building the atmosphere of trust and developing conditions for sharing knowledge between the contracting partners boosts the potential for developing sealed knowledge in cooperation with external companies.

4. Knowledge management in organizational relations with the IT service provider should be regarded as a module of a wider, comprehensive model of knowledge management formulated with the main purpose of identifying methods, instruments

and relations for organizational survival and development, while at the same time limiting its dependence on external actors.

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MODELOWANIE PROCESÓW ZARZĄDZANIA WIEDZĄ
W PROJEKTACH OUTSOURCINGOWYCH Z ZAKRESU IT

Streszczenie: Celem artykułu było ukazanie złożoności działań i procesów związanych z przepływem i transformacją wiedzy w projektach outsourcingowych z obszaru technologii informatycznych w postaci modelu graficznego oraz opis najważniejszych aspektów związanych z zarządzaniem wiedzą w przedsięwzięciach outsourcingowych. Dokonano w nim próby identyfikacji kompetencji i potrzeb organizacji w obszarze IT, wskazano podmioty kluczowe dla funkcjonowania układów outsourcingowych oraz ich rolę w „procesach wiedzy". Ponadto zilustrowano w postaci map wybrane procesy związane z zarządzaniem informacją i wiedzą w outsourcingu IT.

Słowa kluczowe: outsourcing, zarządzanie wiedzą, transfer informacji i wiedzy, procesy wiedzy, mapy procesu.

Część III

Technologie internetowe