IBIMA
Publishing
mobile

Journal of Organizational Knowledge Management

A Swap of Perspectives: Data Migration and Knowledge Management as Mutually Interrelated Disciplines

Authors

Peter Kažimír
College of Management, Bratislava, Slovaki

Vladimír Bureš Caldas
College of Management, Bratislava, Slovakia
University of Hradec Králové, Hradec Králové, Czech Republic

Tereza Otčenášková
University of Hradec Králové, Hradec Králové, Czech Republic

Abstract

Development of business environment is strongly influenced by quick penetration of information technologies (IT) into all organizational processes. This process generates several problems, which single organizations need to cope with. A specific problem is closely related to vast amount of data which is produced every day, processed to valuable information and consequently applied during decision-making processes. There are several reasons, such as progress in business informatics and the IT industry in general, that lead to necessity to change the used IT system completely. This change is accompanied by the requirement of data migration. This process is performed only occasionally, therefore the lack of experience can cause troubles such as lost data or its low usability in the new system. On the

other hand, knowledge management offers tools and methods how to preserve experience and lessons learned and hence avoid several pitfalls of the data migration process. The paper investigates mutual interrelationship of two distinct areas, Data Migration processes and Knowledge Management programs. Basic facts together with various definitions and characteristics of both research topics are presented. The paper reveals that these are closely connected in terms of how data, information and knowledge should be created, enhanced and managed. Therefore, similarities and mutual features of both disciplines are outlined.

Introduction

The pursuit of higher competitiveness makes companies continuously try to apply various types of business concepts and methodologies, or information technology tools, techniques, and methods. One of the business concepts widely implemented in companies is Knowledge Management. Its scope or form is determined by the objectives of organization and the personal objectives and needs of people inside it. Generally, desired implications of Knowledge Management implementation are cost reduction, customer or employee satisfaction and quality (Spek and Kingma, 1999).

Knowledge Management principles are usually applied to business activities, which are knowledge intensive or demanding

(Bureš and Čech, 2007). In the business informatics domain there are projects which companies have to execute and are unavoidable due to penetration rate of information technologies into the contemporary business environment. Information technology (IT) migration in general or Data Migration in particular can serve as an example of such knowledge intensive projects (Kantawala, 2008). On the other hand, Data Migration projects rely on quite significant body of knowledge, which is usually not managed due to low frequency of Data Migration projects occurrence. Therefore, these projects become often more complicated and expensive than previously anticipated (Haller, 2009). Hence, interconnection of both disciplines can be very fruitful and beneficial.

Search for described experience with both Knowledge Management and Data Migration in scientific databases (e.g. Springer, or Elsevier) returns only journal papers or book chapters focused on each discipline separately. However, few studies implicitly tie Knowledge Management and particular aspects of Data Migration. For instance, general frameworks of the Data Migration projects can be considered as outputs based on certain volume of knowledge (Jing et al, 1998; Aboulsamh and Davies, 2011). Nevertheless, this connection is not explicitly stated. Therefore, there is a necessity for mutual interrelation of both domains and explicit identification of mutual features. This endeavor can be contributive to development of both theory and practice of Knowledge Management and Data Migration.

This paper is divided into three sections. First section provides the basic overview of Data Migration issues, including definition, or methodology of its execution. The second section describes Knowledge Management, its characteristics, features and the basics of its implementation. In the third section the relationship between Knowledge Management and Data Migration is issued. It contains a discussion on relationship between both projects, how they can help each other during implementation and comparison of project's methodologies and best practices from both areas of expertise.

Data Migration

There are various IT migrations projects realized by companies – application migration (CISCO, 2009), business process migration

(Aversano et al., 2003), or data center migration (EMC, 2011). Since in the IT world data represents the basic building blocks, all aforementioned types of IT migration have to appropriately cope with Data Migration issues, i.e. IT migration projects have to ensure that correct data from the old system will be preserved and transferred to a new system. Data Migration can be considered as the process of transferring data between storage types, formats, databases applications or computer systems (Bartkus, 2011). In order to have proper data in the new system, following high level activities need to be executed: planning, analysis and design, implementation and closeout (FSA, 2007). All these activities should have scheduled exact timeliness of their occurrence.

As we can see from the published case studies, Data Migration is unavoidable and it can get messy, time-consuming and difficult to conduct. Some surveys quote that 84 % of Data Migration projects running late, over budget or both (Howard, 2011). Data migration is a difficult and unattractive task with high potential for failure. There are five significant barriers to data migration success (Bell, 2011):

- Delaying the data migration effort until it adversely affects the system conversion effort.

- Failing to make informed data migration decisions due to lack of cost and time estimates.

- Failing to fully engage the business in the data migration project.

- Inability to access scarce internal subject matter experts.

- Using inexperienced staff with homegrown tools and unproven processes.

To prevent project failure there have been already surveys, research studies and methodologies created (FSA, 2007), (Howard, 2011), (QLOGIC, 2008), or (Manek, 2003) – see example in Table 1. In summary to ensure successful Data Migration companies need to focus on following nine critical success factors:

1. Perform Data Migration as an independent project, ranging from budgeting through to testing.

2. Establish and manage expectations throughout the process.

3. Understand current and future data and business requirements.

4. Identify individuals with expertise regarding legacy data.

5. Collect available documentation regarding legacy system(s).

6. Define Data Migration project roles and responsibilities clearly.

7. Perform a comprehensive overview of data content, quality, and structure.

8. Adopt a formal methodology that has been tried and tested.

Coordinate with business owners and stakeholders to determine importance of business data and data quality.

Table 1: A High Level Approach to Data Migrations

Stage 1 – Define migration approach	Stage 2 – Plan and conduct data cleansing	Stage 3 – Design migration system	Stage 4 – Construct and unit test migration systems	Stage 5 – Conduct system test	Stage 6 – Convert data into production
Confirm objectives and scope	Prioritise datasets for assessment	Identify data conversion tools	Develop / deploy the extract, transform and load software	Establish data migration testing mechanisms	Load reference data
Develop schedule	Define data quality criteria	Develop data reconciliation approach			Ensure all data cleansing complete
Identify stakeholders	Identify data quality tools				
Establish conversion roles and data quality committee	Assess source system data	Create migration system architecture	Unit test migration system	Conduct data migration trial	Conduct full production migration
Define activities, dependencies and deliverables	Review assessment with data quality decision committee				
Kick-off project		Create automated data cleansing specification	Identify and resolve software issues	Identify and resolve software issues	Resolve data quality and reconciliation issues
Develop data models and data mappings	Cleanse data				
Project management					
Planning		Communication		Risk Management	Quality Assurance

Knowledge Management

Although there are already a number of documented
achievements, many companies are reluctant to undertake
Knowledge Management initiatives because of the difficulty in
establishing a sound business case. The difficulty in establishing a
business case for Knowledge Management programs is
complexity, mostly handled with a method of trial and error. It
often stems from the fact that, since knowledge is intangible, it is
difficult to clearly see direct link from a Knowledge Management
process to a demonstrable business outcome (Yelden and Albers,
2004).

Knowledge Management involves a strategic commitment to
improving the organization's effectiveness, as well as to

improving its opportunity enhancement. There are three spheres of Knowledge Management (Pee and Kankanhalli, 2009):

- Technology – It provides a secure central space where employees, customers, partners and suppliers exchange information, share knowledge and guide each other and the organization to better decisions. This could be in the form of knowledge-portal on the corporate intranet or a centralized repository which allows the team members to use and share information.

- Knowledge Management processes – These include standard processes of knowledge contribution, content management, retrieval, membership on communities of practice, implementation projects based on knowledge reuse,

methodology and standard formats to document best practices and case studies, etc.

- People – The biggest challenge in Knowledge Management is to ensure participation by all team members in knowledge sharing, collaboration and reuse to achieve business results. This is achieved by making small changes in the culture through combination of trainings, motivation/recognition and rewards etc.

The goal of Knowledge Management as a process is to improve the organization's ability to execute its core processes more efficiently. In order to achieve this goal Knowledge Management is formed as a set of proactive activities to support an organization in creating, assimilating, disseminating, and

applying its knowledge. In addition, Knowledge Management is not one time job but it is a continuous process to understand the organization's knowledge needs, the location of the knowledge, and how to improve the knowledge (Hussain et al., 2004). As an interest in Knowledge Management and organizational knowledge grows IT researchers have been promoting a class of information systems, referred to as Knowledge Management Systems (Alavi and Leidner, 2001). In general there are four broad objectives of Knowledge Management Systems in practice (Davenport et al., 1998):

- Create knowledge repository.

- Improve knowledge assets.

- Enhance the knowledge environment.

- Manage knowledge as an asset.

All four of them try to bridge the gap between tacit and explicit knowledge. In practice, any technological solution that could assist in this process is highly appreciated (Stenmark, 1999). One of the keys of the Knowledge Management System is in the way of how to capture intellectual assets for the tangible benefits for the organization. As such, imperatives of Knowledge Management are to:

1. Transform knowledge to add value to the processes and operations of the business.

2. Leverage knowledge strategic to business to accelerate growth and innovation.

3. Use knowledge to provide a competitive advantage for the business.

One of the main goals of all three instances is to ensure that the right knowledge is delivered to the appropriate place or competent person at the right time to enable competent decision making. Applied knowledge has to be subjected to and pass tests of validation (Firestone, 1998). Moreover, the decision should be made based on knowledge which is supported by appropriate information. Appropriate information needs to be extracted, filtered, or formatted in a specific way.

Discussion

The previous two sections introduced Data Migration and Knowledge Management concepts and outlined their definitions, characteristics, typical features, and processes. They are used as a starting point for discussion in the following section, in which a connection between Data Migration and Knowledge Management is explained and areas where both can help each other to make execution easier and smoother are depicted.

Knowledge Management Features in Data Migration

Second section outlined nine critical success factors of successful Data Migration projects. Not surprisingly, they can be linked with

features of Knowledge Management. The explanation is provided in this subsection.

Perform Data Migration as an Independent Project, Ranging from Budgeting through to Testing

Since Data Migration is a project which is unavoidable (QLOGIC, 2008) then lessons learned should be created during the project execution for future reference. Obviously, the lessons learned from previous projects should be always revisited at the beginning of every project (PRINCE2, 2009). Knowledge Management can help to create and use high-quality lessons learned, which basically captures a knowledge that is applied to future action and derived from screening according to specific criteria (Patton, 2001):

- Evaluation findings — patterns across programs;

- Basic and applied research;

- Practice wisdom and experience of practitioners;

- Experiences reported by program participants/clients/intended beneficiaries;

- Expert opinion;

- Cross-disciplinary connections and patterns;

- Assessment of the importance of the lesson learned; and

- Strength of the connection to outcomes attainment.

The idea of high quality lessons learned is that the greater the number of supporting sources for a "lesson learned", the more rigorous the supporting evidence, and the greater the triangulation of supporting sources, the more confidence one can have in the significance and meaningfulness of a lesson learned.

Establish and Manage Expectations throughout the Process

Previous experience embodied in lessons learned can be applied as a foundation for expectations setting. They can be further shaped by knowledge of experienced employees who can contribute to the formulation of expectations. The significance of establishment of expectations is strengthened by the fact that this

factor is important for both types of discussed projects. Therefore, generalization or analogy can be used during this process, and hence basic ideology can be shared. The advantage of the idea to have shared expectations between both implementations is in the centralized manipulation of data, information and knowledge. It will ensure that the same activity is not repeated for both projects separately.

Understand Current and Future Data and Business Requirements

Data is always created in a specific context and, if it is digital, then it is always created by a program of one kind or another. Some data is created for local use. A sales order system records sales orders and that data may be used elsewhere in the order-to-cash

system of which it is a part (Bloor, 2001). Knowledge Management can help to analyze the data and acquire better understanding of what information data contain and identify individuals who benefits from getting this knowledge, and information. Consequently, the knowledge can enable better decision making and give better insight into future business requirements. Certainly, this approach has an impact on development of new IT infrastructure features, business applications and design of processes.

Identify Individuals with Expertise Regarding Legacy Data

It is an advantage if legacy data, which needs to migrate, are handled during migration not only by professionals who have technical expertise but also by professionals who knows what

knowledge data can provide to business stakeholders. Therefore they can identify more accurately which data needs to migrate and in which form they should be stored or transformed.

Collect Available Documentation Regarding Legacy System(s)

Individuals, who work with legacy data and legacy systems, have a knowledge which needs to be available to ensure successful Data Migration. The collection of knowledge about legacy systems is not an easy task to perform. In this case Knowledge Management activities can help to ensure that appropriate information and knowledge are collected and used during Data Migration. The usefulness of knowledge should be guaranteed if four broad objectives of Knowledge Management systems have been met: create knowledge repository, improve knowledge

assets, enhance the knowledge environment, and manage knowledge as an asset. Again, in this way Knowledge Management Systems can be used to help develop new IT infrastructure which will accommodate current and future business requirements.

Define Data Migration Project Roles and Responsibilities Clearly

Even the project will be executed by outside resources there should be developed at least some internal competency with respect to the project. Identification of an appropriate candidate with proper set of knowledge in the given area is crucial. Moreover, ethical issues are of high importance here (Semrádová and Kacetl, 2011). There should not be confusion about Data

Migration project roles and their particular responsibilities. Based on the sphere "People" Knowledge Management can help to identify roles which ensure that the data, which are subject of the migration, are really the data which needs to migrate. It also can help to define responsibilities for the particular roles to ensure that knowledge is shared and prepared to be reused to achieve successful Data Migration.

Perform a Comprehensive Overview of Data Content, Quality, and Structure

It is desirable to start work early on understanding companies' legacy data assets and use the knowledge gained about the data assets to develop defendable time and cost estimates to attract management attention, resources and commitment (Bell, 2011).

The knowledge about legacy data can help also to design a new IT infrastructure which will accommodate customers' and business needs for less cost. To achieve the best results it is advised to use data cleansing, data profiling and data integration tools. Broad analysis of data is not easy to accomplish as well as to create extensive overview of the outcome of analysis. Additionally the overview needs to be intelligible not only to IT staff but also to business staff and end users. The first objective of Knowledge Management System is to create knowledge repository which once created can help to understand data more easily and subsequently help to create an overview of their content, quality and structure.

Adopt a Formal Methodology that has been Tried and Tested

Methodology can be defined as a body of practices, procedures, and rules or study or theoretical analysis of working methods. Basically it provides already created knowledge about what tasks are needed to be done and the reasons why and how they need to be executed. The objective of Knowledge Management is not only to create knowledge but also to improve, enhance and manage knowledge. Consequently the benefit of Knowledge Management is in the way how methodology can be adjusted and how knowledge included in methodology can be used during Data Migration.

Coordinate with Business Owners and Stakeholders to Determine Importance of Business Data and Data Quality

The common feature of all Data Migration and Knowledge Management projects is that the business MUST be engaged throughout all stages of projects, from initial scoping to final completion (Bureš, 2006). One of the spheres of Knowledge Management is "People". Knowledge Management should ensure participation by all team members in knowledge sharing, collaboration and reuse to achieve business results. In the case of Data Migration it should ensure knowledge sharing, collaboration and reuse not only between project team members but also between IT and Business (Jorfi et al., 2011) to achieve successful Data Migration.

Data Migration Aspects in Knowledge Management

Third section delineated essential features and characteristics of Knowledge Management. Four keys of successful Knowledge Management implementation were pointed out. All four of them can be linked with aspects of Data Migration. The explanation is provided below.

<u>Create Knowledge Repository</u>

The objective is to create repositories by storing knowledge and making it easily available to users. In order to store knowledge there is a need to create knowledge. It was pointed out in (Huber and O'Deil, 2000) that information and knowledge form a virtuous circle. Knowledge can be perceived as "information in

use". Knowledge cannot exist without information. With good information, people can make better decisions and take intelligent action. As we already know information comes from data which in the case of Data Migration companies want to transfer to new environments such as databases, storage devices, computer systems, etc. While the data needs to be analyzed during Data Migration and likewise they need to be extracted, filtered, and formatted in a special way it would be beneficial to take advantage of this activity to support Knowledge Management programs to accelerate the speed of knowledge creation and transfer in the company (Coviello et al., 2001). One of the ways how to create knowledge could be via modeling from data (Abdullah et al., 2002). Consequently knowledge is stored in new environment where it should be easier accessed by end users as it was in old environment.

Improve Knowledge Assets

This objective expects that accesses are provided to knowledge and hence knowledge transfer is facilitated. In this case Data Migration can be seen as a strategy to transfer data, information and knowledge. To get the best out of it from the Knowledge Management perspective, a codification strategy with IT can be used to make the knowledge even more explicit. Consequently, the dissemination of knowledge throughout the organization can be performed quicker, by making it readily available in databases, decision support systems, expert systems, or recommendation systems (Čech and Bureš, 2007), ((Bloodgood et al, 2001).

Enhance the Knowledge Environment

The outcome of the objective should be an environment that encourages the creation, transfer and use of knowledge, regardless the specifics of particular environment (Mikulecký, 2003). Data Migration does not only transfer data from one data storage to another but also support and encourage implementation of new tools and systems which accommodate new business needs. Consequently, all systems and tools which are involved during Data Migration can help to design and support a Knowledge Management solution. Such typology consisting of tools as intranet systems, Electronic Document Management (EDM), groupware, workflow, artificial intelligence-based systems, Business Intelligence techniques (BI), knowledge mapping, competitive intelligence tools and knowledge portals

were discussed already in terms of their potential contributions to the processes of creating, registering and sharing knowledge (Baroni de Carvalho and Ferreira, 2001).

Manage Knowledge as an Asset

Data Migration enables the rejuvenation of existing business systems and leverages application use, offering opportunities that current and future technologies provide (Syntel, 2006). For example the successful migration can ensure that business is fed by reliable and accurate reports which can be otherwise delivered in very time-consuming process (Manion, 2001), (SkyParc, 2010). Likewise by adopting new service-oriented solutions, the interfaces of current applications can be updated to

provide additional information, knowledge which can be managed as an asset on the balance sheet afterwards.

Conclusion

The paper has introduced specific information about two areas of expertise: Data Migration and Knowledge Management. It has provided definitions, processes, methodologies and nine success factors to ensure successful execution of Data Migration. It has covered also Knowledge Management topics, namely Knowledge Management goal, three Knowledge Management spheres, and objectives of Knowledge Management System. Afterwards the information about both topics has been used to find mutual beneficial characteristics which can help to make both implementation projects smoother and ensure their successful

completion. The research showed that there are couples of features of Knowledge Management which can help Data Migration to be more successful and likewise there are several aspects of Data Migration which can help Knowledge Management to meet the strategic objectives. Even though results are promising, still detailed research needs to be done in this area. The deeper investigation of the provided ideas would be beneficial for both theoretical research in both areas and practical implementation of both types of projects. The research could also include a comparison of best practices from both areas.

References

Abdullah, M. S., Benest, I., Evans, A. & Kimble, C. (2002). Knowledge Modelling Techniques For Developing Knowledge Management Systems, Proceedings of the 3rd European Conference on Knowledge Management, Dublin, Ireland, 15-25.

Aboulsamh, M. A. & Davies, J. (2011). "Specification and Verification of Model-Driven Data Migration," *Lecture Notes in Computer Science*, 6918, 214-225.

Alavi, M. & Leidner, D. E. (2001). "Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues," *MIS Quarterly*, 25 (1), 107-136.

Aversano, L., Canfora, G. & De Lucia, A. (2003). Migrating Legacy system to the Web: A Business Process Reengineering Oriented Approach, Polo, M., Piattini, M. and Ruiz, F. (eds), Advances in Software Maintenance Management: Technologies and Solutions, *Idea Group Inc*.

Bartkus, G. (2011). 'Data Migration: Basic Overview,' Hie Electronics, McKinney, TX.

Bell, G. (2011). "Data Migration – Key Considerations," *The Data Administration Newsletter*, May 2011. [Online], [Retrieved April 4, 2012], http://www.tdan.com/view-articles/15145.

Bloodgood, J. M. & Salisbury, W. D. (2001). "Understanding the Influence of Organizational Change Strategies on Information Technology and Knowledge Management Strategies," Decision Support Systems, 31 (2001), 55-69.

Bloor, R. (2011). "What you don't Know about Data: What Should Data Know about Itself?," [Online], [Retrieved February 10, 2012], http://www.dataintegrationblog.com/robin-bloor/what-should-data-know-about-itself/.

Bureš, V. (2006). 'Knowledge Management and its Implementation,' Proceedings of the 2nd International Conference on Web Information Systems and Technologies, Setubal, Portugal, 115-118.

Bureš, V. & Čech, P. (2007). "Knowledge Intensity of Organizations in Knowledge Economy," Proceedings of the 3rd International Conference on Web Information Systems and Technologies, Barcelona, Spain, 210-213.

Čech, P. & Bureš, V. (2007). 'Recommendation of Web Resources for Academics - Architecture and Components,' Proceedings of the 3rd International Conference on Web Information Systems and Technologies, Barcelona, Spain, 437-440.

CISCO (2010). 'Planning the Migration of Enterprise Applications to the Cloud,' White Paper. [Online], [Retrieved April 4, 2012], http://www.cisco.com/.

Claypool, K. T., Jing, J. & Rundensteiner, E. A. (1998). "SERF: Schema Evolution through an Extensible, Reusable and Flexible Framework," Proceedings of the International Conference on Information and Knowledge Management, Worcester, MA, 1-8.

Coviello, A. et al. (2001). 'Standardized KM Implementation Approach,' IST Project No 2000-26393 Deliverable D 3.1. European KM Forum.

Davenport, T. H., Delong, D. W. & Beers, M. C. (1998). "Successful Knowledge Management Projects," *Sloan Management Review*, 39 (2), 43-57.

De Carvalho, R. B. & Ferreira, M. A. T. (2001). "Using Information Technology to Support Knowledge Conversion Processes," *Information Research*, 7 (1), paper 118.

EMC (2011). 'Planning a Data Center Migration: Five Key Success Factors,' *EMC Corporation*, Hopkinton, MA.

Firestone, J. M. (1998). "Basic Concepts of Knowledge Management," White Paper prepared for Executive Information Systems, Inc. Wilmington, DE.

FSA (2007). Data Migration Roadmap: A Best Practice Summary, Version 1.0. Department of Education Office of Federal Student Aid. [Online], [Retrieved February 24, 2012], http://federalstudentaid.ed.gov/static/gw/docs/ciolibrary/ECONOPS_Docs/DataMigrationRoadmap.pdf.

Haller, K. (2009). "Towards the Industrialization of Data Migration: Concepts and Patterns for Standard Software Implementation Projects," *Lecture Notes in Computer Science*, 5565, 63-78.

Howard, P. (2011). 'Data Migration – 2011,' Bloor Research, London, UK.

Hubert, C. & O'Deil, C. (2000). "Successfully Implementing Knowledge Management," *American Productivity and Quality Center*. [Online], [Retrieved April 4, 2012], http://www.providersedge.com/docs/km_articles/Successfully_Implementing_KM_-_APQC.pdf.

Hussain, F., Lucas, C. & Ali, M. A. (2004). "Managing Knowledge Effectively," *Journal of Knowledge Management Practice*, May 2004, 1-12.

Jorfi, S., Nor, K. M. & Najjar, L. (2011). "The Relationship between IT Flexibility, IT-Business Strategic Alignment, and IT Capability," *International Journal of Managing Information Technology,* 3 (1), 16 - 31.

Kantawala, A. (2008). "Case Study: Data Migration for a Global Semiconductors Manufacturer," Messner, W., Hendel, A. and Thun, F. (eds), *Rightshore*!: Successfully SAP® Project Ofshore, *Springer Verlag*, Heidelberg.

Manek, P. (2003). Microsoft CRM Data Migration Framework, White Paper. [Online], [Retrieved April 4, 2012], http://download.microsoft.com.

Manion, J. (2011). "Streamlining the Reporting Process, Part 1," [Online], [Retrieved February 18, 2012], http://www.stratigent.com/community/websight-newsletters/streamlining-reporting-process-part-1.

Mikulecký, P. (2003). "Information and knowledge Support of a Student in a University Environment," Proceedings of the International Conference on Computer as a Tool, Ljubljana, Slovenia, 108-111.

Patton, M. Q. (2001). "Evaluation, Knowledge Management, Best Practices, and High Quality Lessons Learned," *American Journal of Evaluation*, 22 (3), 329-336.

Pee, L. G. & Kankanhalli, A. (2009). "A Model of Organizational Knowledge Management Maturity Based on People, Process, and Technology," *Journal of Information & Knowledge Management*, 8 (2), 79-99.

PRINCE2 (2009). 'Managing Successful Projects with PRINCE2: Office of Government Commerce,' *The Stationery Office*, Norwich, UK.

QLOGIC (2008). "Data Migration – A Never-Ending Story," *White paper*, *QLOGIC*, Aliso Viejo, CA.

Semrádová, I. & Kacetl, J. (2011). "Ethics in the Future Manager's Professional Training," *E+M Ekonomie a Management,* 14 (2), 79-89.

SkySparc (2010). KEVA: Stremlining the Reporting process with Skyreport, SkySparc Wallstreet Excellence. [Online], [Retrieved February 18, 2012], http://www.skysparc.com/pdf/case_study_keva.pdf.

Stenmark, D. (1999). "Using Intranet Agents to Capture Tacit Knowledge," *Proceedings of the WebNet 1999, Chesapeake,* Honolulu, Hawaii, 1000-1005.

Syntel (2006). Six Steps to Migration Project Success, *Applications: A White Paper Series, Syntel Inc., Troy, MI.*

Van der Spek, R. & Kingma, J. (1999). "Achieving Successful Knowledge Management Initiatives," CBI/IBM (eds), Liberating knowledge, business guide of Confederation of British Industry, *Caspian Publishing, London.*

Yelden, E. F. & Albers, J. A. (2004). 'The Business Case For Knowledge Management,' *Journal of Knowledge Management Practice*, August 2004, 1-12.