Usage of Business Intelligence Solutions within the Mergers and Acquisitions process

CHRISTOPH MUELLER

Vysoká škola manažmentu v Trenčíne / City University of Seattle programs
Trenčín, Slovakia

Abstract: The more markets are developed, the more difficult it becomes to open up intrinsic business growth. Mergers and acquisitions are on the agenda. While this used to be a topic for large corporations in the past, this form of transaction is now becoming increasingly important for small and medium-sized companies as well. It is important to obtain a quick, yet holistic and well-founded overview of a company in today's fast-paced world. Due to a lack of time and ressources it is important to use intelligent solutions to support the process.

Keywords: Business Intelligence; Data Warehouse; Data Analytics; Scorecard Model; Mergers and Acquisitions

1 Introduction

The approaches for company growth are diverse. Organic growth through the gain or recovery of market share are possibilities as well as the development of new markets and the acquisition of competitors or complementary companies [1]. Depending on time, market and company, the right approach needs to be chosen. While in the past Mergers and Acquisitions (M&A) were more likely executed by multinational companies, the number of transactions of mid-size companies is nowadays growing steadily [2]. In addition to the above-mentioned background, there are still two specific approaches for smaller companies for a vertical or a horizontal expansion. On the one hand, the negotiating power with regard to customers and suppliers increases as a result of the increase in volumes. On the other hand, small and mid-size companies all around the globe facing the challenge of not having a successor of the company [4].

M&A are based on a thorough examination [5]. In big companies, whole de-partments are entrusted with the so-called Due Diligence (DD) in the context of company acquisitions. As a basis of the DD, the company to be examined is split into different subdivisions. Each one is examined with separate checklists to ensure that the essential points at each level have been subjected, analyzed and audited. However, the capacity of the company's internal assessment of the findings and the drawing of the correct conclu-sion are often limited due to a lack of time and experience. Therefore small- and mid-size companies often involve external partners to cover the missing experience and capacity [2].

Despite the fact that DDs have been outsourced and external experts such as con-sultants have been involved, companies are not seldom in a state of economic problems after the takeover. Sometimes the whole transaction is being completely cancelled. The success of an M&A activity is strongly depending on the analysis of the target company during the DD process. The success rate of M&As could be increased by integrating the DD into the strategic controlling approach of the company and evaluating the target company in the same way company controls its organization by using Business Intelligence (BI) solutions.

2 Controlling

Behind company-wide, active controlling and active corporate management, there is much more than a cost control system. An integral part of company-wide integrated controlling is the commercial, technical, sales, market and environment-based controlling. Nowadays, controlling by means of detailed and constantly reviewed planning and simulations prevents wrong decisions and efficiency losses of all kinds. Companies gain access to transparent structures and procedures, in which improvement and cost-saving potentials as well as growth potentials can be identified. It is the crucial foundation for current and market-oriented corporate governance. In general, it helps to permanently improve results, to plan the success of individual departments in detail and to detect and eliminate weak points. Controlling and the associated BI systems are a key factor in business success, regardless of size and global positioning. KAPLAN AND NORTON understood the shortage and inefficiency of the classical Performance Measurement System (PMS) and created a model that had a more holistic view which eliminated the problems of classical PMS. With the invention of the Balanced Scorecard (BSC), organizations focused on short and long-term goals, monetary and non-monetary indica-tors and perspectives of external and internal performances [6]; [7].

The ultimate goal of the BSC was to translate strategy and vision of an organiza-tion into measurable objectives. Those objectives can be subdivided into four different perspectives: Financial, customer, internal-business-process and learning and growth [8]. The expectations of the shareholders define the financial perspective. The customer perspective identifies how the organization wants to be seen by its customers. The internal-business-process perspective explains the business processes the organization adapted to satisfy the expectations of shareholders and customers. The learning and growth perspective shows the improvements and changes the organization needs to implement in order to translate vision into strategy. KAPLAN AND NORTON encouraged managers to monitor Key Performance Indicators (KPIs) of the four respective categories that picture a balanced view between short and long-term goals, monetary and non-monetary indicators, and a perspec-tive of external and internal performance [6]. But all KPIs should be linked with financial goals because if the employees are not satisfied with the new formed organization, their performance will not increase over time and hence the in-ternal processes will not become leaner [20]. Therefore, customer requirements cannot be pro-cessed in an appropriate time which can lead to unsatisfied customers. As a consequence, sales will drop, and this will impact the financial KPIs.

3 Due Diligence

There is not one overall valid definition of DD in the existing literature. It can be described as a detailed examination of a company and its financial records, executed before becoming involved in a business arrangement, such as buying or selling its shares [3]. It is the investigation with a reasonable standard of care [2]; [9]. Further specified is the careful analysis and valuation of an object in a business transaction [10]. Concept and wording were created and established in the United Stated of America as part of the security laws and is nowadays used all around the globe [11].

It does not primarily refer to the components and circumstance of the test but to the quality of the tested components [12]. Initially, the main components were financial, tax, legal, commercial, organizational and technical DD. Due to developing markets and the differences between industries the number and the content of DD can be different [23]. The reasons for a DD are diverse and range from the departure of a shareholder, on to the transformation of the

company form. Other reasons can be the follow up with a turnaround of an enterprise after its recovery and the final sale of the company [19]. The basic structure is further subdivided and adjusted depending on the reasons and the resulting focus of the audit. Depending on the scope of the test, a distinction is made between full and partial DD. When buying a company, a fully comprehensive audit is performed, which also has a high level of detail [14]. The main requirement is to recognize the opportunities and risks of a company purchase in advance and thereby to prepare the fundamental decision regarding a company purchase [2].

It is the goal to conduct a complete and consistent assessment of the target company. Therefore all all transactions that are responsible for the success of a company with a 360-degree view of the company need to be analyzed [24].

4 Business Intelligence

The term BI stands for an integrated, enterprise-specific, IT-based overall approach to business decision support [16]. The goal is to create in-house data sets, analyzes and evaluations supplemented by external data. These must then be made available to decision-makers in the company, according to the rights and roles within the company. It is important to clarify that BI systems cannot replace a cost-effective accounting within a company. However, they represent a supporting factor. This is especially the case when the controlling systems cannot provide the available data in the desired form and when there is a need for data analysis to obtain information.

Moreover, in times of internationalization and globalization a well-functioning BI solution is an essential resource in this context for creating a strategic competitive advantage [16]. To enable successful, strategic action, it is mandatory that those responsible have an in-depth understanding of the company's performance. The link to the corporate strategy is fundamental. The best BI solution is useless, if it does not result in improved business decisions that support the business strategy. Successful BI solutions should, therefore, include measurable business goals, KPIs and actions based on business results. Implementation of a BI system offers the company the opportunity to question the strategic goals and uncover inefficiencies in the organization's decision-making process. A very important factor of success of such a system is the acceptance by potential users. Accordingly, from the beginning, it must be considered which employees should have access to the system and which goals should be linked to the use of the system [30].

The BI approach consists of three main components. These components are referred to as Data sources, Data Warehouse, and its analysis tools. For a holistic view of the BI approach in a broader sense, the work below deals with the components used directly or indirectly for the decision support in more detail. The delineation of the individual BI subareas makes sense, since some concepts are used synonymously in practice, they are all components of BI, but based on completely different concepts. Overall, the BI approach can be seen as a value chain in which information is extracted from data at different stages, which information is captured by the users in the form of knowledge and ultimately leads to an action that improves the situation. The goal is more efficient management of resources which can generate a big advantage in the M&A process in terms of saving resources [21].

4.1 Data sources

The first step is to identify the information needs of users and decision makers. It is thus necessary to clarify which data are required to obtain the relevant information. It needs to be

evaluated if the data can be found internally or if additional sources of procurement need to be found for data that are not yet available [22]. The problem with obtaining data is a lack of consistency, a lack of up-to-dateness, a missing time reference, version problems and missing semantics. All this leads to performance losses and cost increases [21]. If possible, this step should be automated as much as possible; qualified employees should be more concerned about analysis than about preparation of the data and the data collection [31]. After determining the internal and external data requirement, automatism must first be created in the data acquisition and data transmission necessary for the operation of the system [16].

4.2 Data Warehouse (DWH)

Information is the fourth factor of production and also a decisive competitive factor in a company. The DWH meets the challenge of this task. It serves to create an information offer and forms the basis for the management of the production factor [21]. The goal is to develop a comprehensive database with the DWH to enable the analysis of complicated issues [17]. The idea for this is originally from the year 1990 and was conceived by INMON [26]. The term is used to describe a database isolated from operational data processing systems, which serves as a company-wide, consistent database of current and historical data as a management support system [23]. The difference between operational systems and the DWH is the following: in operational systems, the current data are stored. This can be changed by updates at any time. A DWH, on the other hand, contains a whole history of data [23].

Setting up DWHs improves the internal and external reporting of a company significantly in terms of consistency and availability of data as well as flexibility of the department in the information retrieval. High standardization in development based on a DWH specific process model also reduces both development time and costs, as well as subsequent maintenance costs [29]. The DWH contains the finest data granularity. All derivations, aggregations, and domain related relationships are referred to as data marts. The advantage is that the DWH creates a common information base. Data marts can individually access DWH data and external data. All data are collected centrally in the DWH. From this consistent database, called hub, function-related data marts are created. The issue of the heterogeneous data foundations described above influences not only the technical standardization but also the technical structure of the DWH [30].

4.3 Analysis tools

Nowadays, business is done in a confusing world of data. Data overflow and a lack of information are not contradictory. Internal data originate from the operative business; external data can be procured by third parties. The challenge is to prepare the relevant data out of large data volumes in such a way that they can be further processed by using suitable tools. The first big hurdle is taken with construction of the architecture and regular updating of the database. However, the data alone are not an added value [21]. Therefore, the extensive data stored in the DWHs and Data Marts must be analyzed. This only makes sense if they are brought into a context, resulting in valuable information. The problem is thus to process the large amounts of data with suitable tools to obtain relevant information [31]. For this, it is necessary to know if and if so, which relationships exist between the data and how they can be evaluated. Within BI, there are numerous approaches to analyzing the data. In the following text, three possible tools are presented: data mining, online analytical processing (OLAP) and reporting, which essentially provide the basis for all systems used in practice. Their use is essential to implement customer orientation [36]. In all kinds of businesses, Microsoft Excel is a popular tool for

processing information. Although it can not generally be defined as a BI instrument, it does represent a data source and a proven assisting tool [30].

a) Data Mining

The data mining process helps to identify and uncover new, previously unknown relationships and hidden patterns in large volumes of data before any concrete need for information or analysis exists [31]. The basic techniques of data mining are multivariate statistical methods, such as regression, factor and cluster analysis or induction, neural networks and data visualization. In this way, algorithms and associations are found which help to discover classifications and to make corresponding groupings. With the help of the association rule, correlations between different KPIs can be demonstrated. It is important to understand the link between the different levels of the company and how one perspective influences the other [36].

b) Online Analytical Processing (OLAP)

Another tool for analytical data evaluation is the OLAP concept. This is a hypothesis-based analysis method. Either the multidimensional structures revealed by data mining or manually generated queries are checked. The established hypothesis is then confirmed or rejected by the analysis result [30]. It is important to present the knowledge gained in the system in such a way that the provider can simply process it further. Thus, the alignment of the data to the needs of the management takes place. Specific views on multi-dimensional but hierarchically condensed data are typical. The analysis allows the user to break down the data into layers and cubes to get an overview of the data from different perspectives. OLAP supports the ability to perform ad hoc queries in addition to predefined queries as faster responses are delivered through shorter re-times. OLAP is particularly suitable for analysis of data in time dependencies and for filtering out deviations and outliers [29]. Furthermore, it is possible to change the level of detail within a perspective and change to another record on one perspective [37].

c) Reporting structure

The fast pace and complexity of the markets has an impact on the planning and controlling processes. They are increasingly in need of optimized reports that allow rapid adjustment. Furthermore, there is an increased need for well-founded information on the income and risk situations of institutions as the basis for decisions. In the past, this led to even more diverse, partially redundant and not user-friendly reports, which were very complex and, therefore, difficult to understand. The areas in which reports are generated can be divided into internal and external. Internal reporting includes the view on profitability, sales performance, risk, organization and processes. The external reporting system can be subdivided into supervisory law and accounting [37]. Reporting should increase the quality of information for users. Therefore, the reports must be easily accessible and must contain information for the purpose of the user [38]. It is very important to pay attention to the level of detail [29]. The individual reports must be linked together in the sense of a logical and technical top-down link in order to identify causes for changes [38]. The difficulty can be seen in the abundance of past-related data and the future-oriented strategy of deducing targeted actions. Furthermore, organizations, must be future oriented, this is why the importance of qualitative factors increases.

5 Mergers and Acquisitions setup

How could the theoretical concept of controlling, DD and BI end up in an overall setup combining all three aspects? It is the objective to increase the success rate of M&As by integrating the DD into the strategic controlling approach of the company. Furthermore, it is

the target to evaluate the target company in the same way as the company controls its organization by using BI solutions. The idea is to combine the different theories in a so-called DD Scorecard.

5.1 Due Diligence Scorecard

The DD Scorecard allows a potential acquirer of a company during a DD process to get a fast overview of the actual situation of the company.

For all the dependencies, the KPIs need to be defined to make the dependencies measurable. First of all, it is important to define goals. Goals which are measurable via KPIs and goals which can be compared via benchmarks. Those goals need to be defined for each marketing program, which has the goal to create customer engagement. An im-portant part of the marketing planning process is identifying up-front what decisions need to be made to drive company profits, and then building the measurements to capture in-formation that facilitates these decisions [25]. Things should not be measured because they are measurable, but because they will guide the company towards the deci-sions which need to be made to improve the company's profitability. It is important to set up control groups to evaluate the spending levels across markets to measure relative im-pact and to have an internal benchmark. This kind of variance within the marketing program is important to improve marketing programs as well as marketing precision and mix [18].

Benchmarks given by the market or the company need to be considered. The benchmarks differ depending on the company and the area the company is acting in. The experience and existing knowledge, as well as the resulting comparability of companies, are greater in the case of competing companies than the comparison of complementary companies up or down the value chain. A dashboard for the marketing program, there-fore, relates to companies which are in direct competition with each other [27].

As mentioned before there is a lot of data around, the important thing is to define, which ones are the relevant KPIs which help to measure the success of the company's marketing program. A small number of metrics is enough to lead, but the selection needs to show the key financial metrics [25]. But not only the right selection is im-portant, also the presentation needs to be considered. Speedometers for example show progress versus goals. Line charts show trends. KPI alerts are effective to indicate your upward, downward or flat progress against KPIs [18].

5.2 Back End

The DWH architecture is created according to the requirements of the implementing company. It is based on the key figures or the data needed to calculate them. The structure is important for future evaluations and relevant to the smooth migration of historical, current and future data. When building the solution, it makes sense to integrate as many components as possible into the back end from the technical side as changes in the structure are easier to implement there than at the front end [31].

It does make sense to outsource the Back End to a DWH server, which is hosted by an external provider. This leads to cost reduction through improved use of the hardware. Another advantage usually is increase in performance as the server structure of professional providers usually allows access to a variety of data sources. For the files of most different formats, there are extensive possibilities of transformation. The metadata are centrally managed and used throughout the company. This allows all users to access the same information without requiring synchronization. There is a high reuse in the platform based on user permissions and data

descriptions. The data must, therefore, be kept relational and multidimensional so that a parallel read in different aggregations is possible. The centralization of the metadata thus influences all areas of the concept. Subsequently, the historical data must be migrated into the new DWH structure [30].

5.3 Dashboard as Front End

For optimal communication with the internal and external partners, such as consutants and the target company visualization of the information must be done with web-based dashboards [28]. This can maximize the benefits of a BI system and minimize or, at best, eliminate the risks, including time and cost issues. Applications for laptops and smartphones also enhance this service. In addition, DWH data are always up-to-date as changes and entries in the system lead to an immediate update. These framework conditions are the basis for the realization of targeted and cause-appropriate decisions. In a web-based BI system, all the BI functionalities that are required are contained in the form of a total solution. This includes reporting, dashboarding, analytics, self-service, process integration, and upstream data integration. The service starts from a historical perspective and allows you to query historical events and results. Besides that predictions for the future are possible as well. Furthermore, the visualization as well as forecasts and developments for the future can be derived from the current business process. Root cause analysis minimizes risk by greatly reducing the time it takes to find irregularities and abnormalities. Each user has an individual dashboard, which in turn consists of predefined elements according to his roles and rights. For the tools, it is important to have a common, consistent operating philosophy that makes the job easier for the user. This creates a high level of acceptance [29].

The template shown below is an example of a dashboard, including some examples of the defined KPIs and evaluation according to their benchmark, is displayed. While in the lower part, the evaluation of soft KPIs is shown, the upper part shows the financial level and a selection of its key figures. The indicators are shown in different ways, which allows the evaluating employee to get a fast overview and to do further research on the ones in a critical stage.
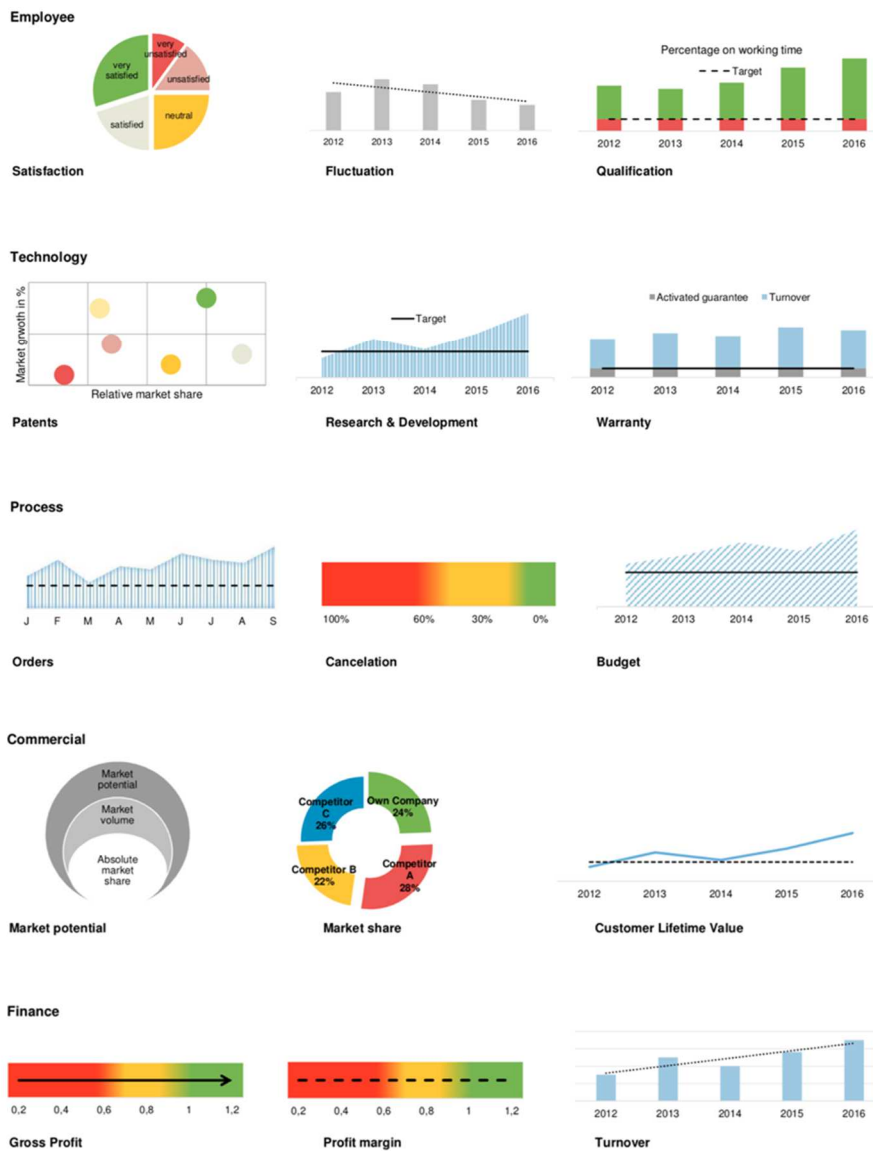
Fig. 1 *Strucutre of the Dashboard*

The data provided will be of benefit to the company only if they are also utilized by the use of tools [37]. In addition to the predefined key figures per level, it is possible to make individual adjustments. The output is in the context of result tables and graphics. They tell you what value each of these metrics currently has, how far away they are from the next critical value, and what size would be the optimal value. They illustrate the current situation and the expectaiton for the future. The top strategic targets are presented graphically. The number of parameters should be limited to about five. The user can access the underlying detailed information via a drill-down function from the highest hierarchical level of the various control and business areas. For example, if misconduct of a key figure becomes clear when opening the entry page, the decision maker can go directly to the next lower level by selecting the key figure and receive more detailed information there [38]. Presenting the most important data not only in the tabular form but also graphically provides the opportunity to give a quick overview of the degree of achievement of the tasks to be fulfilled. This results in a high degree of acceptance among the

respective process owners as they are supported in their task fulfillment and direct activities can even be initiated from a predefined set of measures [10].

6 Conclusions

Companies are limited in knowledge and capacity within the DD process. By establishing a standardized procedure companies can first create the knowhow of the DD process in house, which makes them being more independent from external consultants. This will already decrease the costs for coordination expenses within the company and the fees to be paid directly to the external consultants. Furthermore, it will be a concept, which can be multiplied and used for different DDs up to come in the future. Considering the scale effect the one time set up cost will pay off with a number DDs as well.

As the approach of the DD is new and generates a new and faster way of the DD this will not only save the time of the potential acquirer but as well of the potential seller. It makes the DD leaner and more efficient. The collaboration will be easier and this will increase the satisfaction of both parties involved. In every market, the players know each other. M&A are taking place in every one of them not depending on the business area. They are delicate as the involved parties do have different interests. A structured and transparent procedure helps to understand the parties, to understand each other better. At the end, the atmosphere during the DD process will be better, it won't even be important, if the merger is finally going to happen, as the parameters are clear and understandable for everyone. This will help to increase the respect and the reputation of the potential acquirer. As the rest of the market players will receive this information as well this can be a competitive advantage for future sales, when companies are searching for interested acquirers. The market will take note of the innovative approach which might even cause an interest of other companies in adapting to the model, which could even cause a new business model for the future.

The prodcut lifetime in IT is relatively low compared to other technologies. What still represents the state of the art today may not be up-to-date tomorrow. In addition, not everything that is technically feasible also makes economic sense. But there is no doubt that the BI approach offers companies a great opportunity to use their resources and potential more effectively and to increase their efficiency. However, individual distinguishing features are in the service from the customer's point of view. It is, therefore, advisable to carry out such a project with a partner who, in addition to the business administration knowledge, has the necessary IT know-how. It is important to understand that support can make a difference to successful implementation of such a project. Industries in which industrialization has already progressed have been aware of this fact for some time. The focus is, therefore, increasingly on product development, customer satisfaction and improved quality in the processes.

References

1. Gerybadze A., Hommel U., Reiners H. W. and Thomaschewski D., Innovation and International Corporate Growth. Heidelberg, Germany: Springer, 2010.
2. Koch W. and Wegmann J., Manual Due Diligence - Analysis of medium-sized companies, Praktiker Handbuch Due Diligence - Analyse mittel-ständischer Unternehmen. Stuttgart, Germany: Schäffer-Poeschel, 2002.

3. Koch W., Manual Due Diligence: Holistic Analysis and Evaluation of Companies, Praktiker-Handbuch Due Diligence: Ganzheitliche Analyse und Bewertung von Unternehmen. Stuttgart, Germany: Schäffer-Poeschel, 2011.

4. Hauser H.-E., Kay R. and Boerger S., Company succession in Germany 2010 to 2014 - estimation with further developed procedure, Unternehmensnachfolgen in Deutschland 2010 bis 2014 - Schätzung mit weiterentwickeltem Verfahren. Institut für Mittelstandsforschung Bonn (Hrsg.): IfM-Materialien, 198, 2010.

5. Stern L., The Crucial Role of Due Diligence. Mortgage Banking, 1993.

6. Fernandes K. J., Raja V. and Whalley A., Lessons from implementing the balanced scorecard in a small and medium size manufacturing organization. Technovation, 2006.

7. Horváth P., Controlling. Stuttgart, Germany: Vahlen, 2009.

8. Lehner S., Performance Measurement of an Internal Service Team. Munich, Germany: Grin Verlag, 2014.

9. Eichborn R., The small Eichborn, economics and business law, English-German, Der kleine Eichborn, Wirtschaft und Wirtschaftsrecht, Englisch-Deutsch. Burscheid, Germany: Siebenpunkt, 1994..

10. English G., Journal of Commercial Lending, pp. 19f, 1994.

11. Russ W., Due Diligence, in: K. Becker, M. Castedello and I. Esser, Valuation and Transaction Consulting: Business Evaluations, Due Diligence, Fairness Opinions, Bewertung und Transaktionsberatung: Betriebswirtschaftliche Bewertungen, Due Diligence, Fairness Opinions. Düsseldorf, Germany: IDW Verlag GMBH, 2018.

12. Howson P., Due Diligence: The Critical Stage in Mergers and Acquisitions. Burlington, USA: Gower Publishing, 2017.

13. Krüger D. and Kalbfleisch E., Due diligence on the purchase and sale of companies, Due Diligence bei Kauf und Verkauf von Unternehmen. DStR, 1999.

14. Scott C., Due diligence in practice; Minimize risks in corporate transactions, Due Diligence in der Praxis; Risiken minimieren bei Unternehmenstransaktionen. Wiesbaden, Germany: Gabler, 2011.

15. Unzeitig E. and Kulhavy H., Overview Due Diligence, Due Diligence im Überblick, in: J. Littkemann: Shareholder controlling, Beteiligungscontrolling. Herne, Germany: nwb, 2009.

16. Gansor T., Totok A. and Stock S., From Strategy to Business Intelligence Competency Center (BICC) - Conception, Operation and Practice Von der Strategie zum Business Intelligence Competency Center (BICC) – Konzeption, Betrieb und Praxis. Munich, Germany: Carl Hanser, 2010.

17. Heesen B., Effective Strategy Execution: Improving Performance with Business Intelligence. Wiesbaden, Germany: Spinger Verlag, 2015.

18. Epstein M. C. and Buhovac A. R., Making Sustainability Work: Best Practices in Managing and Measuring Corporate Social, Environmental, and Economic Impacts. New York, USA: Berrett-Koehler Publishers, 2014.

19. Winkler R., Corporate governance as a value driver of due diligence, Corporate Governance als Werttreiber der Due Diligence. Hamburg, Germany: Verlag Dr. Kovac GmbH – Fachverlag für wissenschaftliche Literatur, 2013.

20. Krafft M. and Frenzen H., Sales Controlling, in: Handbook Marketing Controlling. Effectiveness and efficiency of a market-oriented corporate governance,

Vertriebscontrolling, in: Handbuch Marketingcontrolling. Effektivität und Effizienz einer marktorientierten Unternehmensführung. Wiesbaden, Germany: Gabler, 2006.

21. Christians U., Performance Management and Risk Strategy implementation with risk-integrated balanced scorecard, intellectual capital statements and value networks. Methodology and case studies from the banking sector, Performance Management und Risiko Strategieumsetzung mit risikointegrierter Balanced Scorecard, Wissensbilanzen und Werttreibernetzen. Methodik und Fallbeispiele aus dem Bankensektor. Berlin, Germany: Berliner Wissenschaftsverlag, 2006.

22. Pufahl M., Sales Controlling - How to Control Sales, Sales and Profit, Vertriebscontrolling – So steuern Sie Absatz, Umsatz und Gewinn. Wiesbaden, Germany: Gabler, 2006.

23. Totok A., Development of a Business Intelligence Strategy - Analytical Information Systems: Business Intelligence Technologies and Application, Entwicklung einer Business Intelligence Strategie - Analytische Informationssysteme: Business Intelligence-Technologien und Anwendung. Berlin / Heidelberg / New York: Germany / USA: Springer, 2006**.**

24. Scherer C., Custodian banks are facing new challenges, Depotbanken stehen vor neuen Herausforderungen. Munich, Germany: IT-Banken & Versicherungen, 2007.

25. Hoffmann M. and Mertiens M., Customer Lifetime Value Management: Creating and increasing customer value: concepts, strategies, practical examples, Customer-Lifetime-Value-Management: Kundenwert schaffen und erhöhen : Konzepte, Strategien, Praxisbeispiele. Wiesbaden, Germany: Gabler, 2000.

26. Inmon W. H., Building the Data Warehouse. New York, USA: QED Publishing Group, 1990.

27. Johnson G., Scholes K. and Whittington R., Strategic Management - An Introduction: Analysis, Decision and Implementation, Strategisches Management- Eine Einführung: Analyse, Entscheidung und Umsetzung, Munich, Germany: Pearson Studium, 2011.

28. Hungeberg H. and Wulf T., Basics of corporate governance, Gundlagen der Unternehmensführung. Berlin / Heidelberg / New York: Germany / USA: Springer, 2007.

29. Humm B. and Wietek F., Architecture of Data Warehouses and Business Intelligence Systems, in: Computer Science Spectrum Architektur von Data Warehouses und Business Intelligence Systemen, in: Informatik Spektrum. Frankfurt, Germany: Springer, 2005.

30. Azevedo P., Business Intelligence and Reporting with SQL Server 2008 - OLAP, Data Mining, Analysis Service and Integration Services with SQL Server 2008Buiness Intelligence und Reporting mit SQL Server 2008 – OLAP, Data Mining, Analysis Service und Integration Services mit SQL Server 2008. Unterschleißheim, Germany: Microsoft Press, 2009.

31. Schneppel U., Analysis of Multidimensional Data Structures - Data Warehousing - Data Mining - OLAP Analyse multidimensionaler Datenstrukturen - Data Warehousing – Data Mining – OLAP. Bonn, Germany: mitp, 1998.

32. Martin W., Data Warehousing – Data Mining – OLAP. Germany; mitp, 1998.

33. Hönig T., Desktop OLAP in theory and practice, Desktop OLAP in Theorie und Praxis. Bonn, Germany; mitp, 1998.

34. Hildebrand K., Data and information quality: on the way to information excellence, Daten- und Informationsqualität: Auf dem Weg zur Information excellence. Wiesbaden, Germany: Vieweg+Teubner, 2008.

35. Kaplan R. S. and Norton D. P., Balanced Score Card: Successfully implementing strategies, Balanced Score Card: Strategien erfolgreich umsetzen. Stuttgart, Germany: Schäffer-Poeschel, 1997.

36. Wurl H. J. and Mayer J. H., Design concepts for success factors - based balanced scorecards Gestaltungskonzepte für Erfolgsfaktoren – basierte Balanced Scorecards. Wiesbaden, Germany: Zeitschrift für Planung, 2000.

37. Leser U. and Naumann F., Information Integration - Architectures and Methods for Integrating Distributed and Heterogeneous Data Sources, Informationsintegration – Architekturen und Methoden zur Integration verteilter und heterogener Datenquellen. Heidelberg, Germany: dpunkt, 2007.

38. Brugger R., The IT Business Case: Cost measurement and analytics Value recognition and quantification Demonstrate and realize cost effectiveness, Der IT Business Case: Kosten erfassen und analysieren Nutzen erkennen und quantifizieren, Wirtschaftlichkeit nachweisen und realisieren. Berlin / Heidelberg / New York, Germany / USA: Springer, 2005.

Contact data:

Christoph Mueller, MSc
Vysoká škola manažmentu v Trenčíne / City University of Seattle programs
Aschenhausweg 2/3, 74523 Schwaebisch Hall, Germany
Christoph.mueller.msc@gmail.com