

# The role of qualitative data in the management of enterprises

*Cezary Stepniak*

*Częstochowa University of Technology*

*Częstochowa, Poland*

*cezary.stepniak@wz.pcz.pl*

## Abstract

The article refers to the issue of the use of qualitative data in management processes. The article was compiled on the basis of the results of surveys on the principles of using qualitative data for management purposes. The research results indicate that in the surveyed enterprises the most frequently used is qualitative data referring to the quality of services and products as well as training materials. This is confirmed by the results referring to the areas of activity of enterprises in which qualitative data is used. The results showed that the share of qualitative data in the decision-making processes is relatively low, especially at the strategic level. Therefore, it seems logical to request for the need to undertake work on tools for ordering qualitative data within individual enterprises.

**Keywords:** Qualitative data, quantitative data, dusk of ERP/BI class systems, areas of application of qualitative data, types of qualitative data.

## 1. Introduction

The end of the last century was characterized by the basic role of ERP/BI (Enterprise Resources Planning / Business Intelligence) systems in supporting business management processes [18]. As a part of the processing, the basic role was played by quantitative data collected mainly on the basis of description of current activity of a company. In the nineties of the last century, the career of the Internet network was just beginning to develop, along with all the services that are available through it. Along with the development of the Internet, the qualitative data started to play an increasingly important role in business management [17].

It can be assumed that the development of information systems or wide area networks is still being continued, which is a consequence of the emergence of new types of ICT tools. A phenomenon arises that, on the one hand, new types of ICT tools are constantly emerging, and on the other hand, their users reveal new types of information needs. These needs no longer refer to the analysis of economic results of current operations only, but users are interested in such information resources, which would be a source of inspiration for them to grow their own market position, and at the same time provide information about the current perception of a company in its surroundings. This type of role can be performed by qualitative data. They describe various types of issues that can be used in business management.

These considerations deal with the issue of the role that qualitative data plays in modern enterprises. In the article, the issue of qualitative data was undertaken from the point of view of their content and areas of activity in which they can be used for management purposes. It publishes the results of research carried out in 68 enterprises.

The issues included in the article are a part of a wider research on the use of qualitative data in business management and the possibility of using various types of ICT tools for this purpose. This study assumes that various types of tools are available for processing qualitative data (eg BigData, semantic technologies or Sentiment Analysis tools), and most companies collect quantitative data (usually using ERP/BI systems for this purpose). The aim of this research was to examine how and where qualitative data is used in management. The obtained results will be the basis for further research aimed at identifying what type of ICT tools can be used at different levels of management.

The structure of the article comes down to presenting the role of qualitative and

quantitative data as well as their potential connections in business management. Next, the goals and methodologies of the research were presented. As part of the results, the types of qualitative data used are presented, viewed from the point of view of their content, areas of application and scope of decisions made. The conclusions aim at presenting the current state of using qualitative data in management.

## **2. Quantitative data and qualitative data in company management**

The collection of information resources should depend on the information needs of the organization. It can be assumed that in the present century a significant part of information processes is implemented using ICT tools. These can be various types of IT systems used in enterprises (such as, among others, ERP/BI, CRM, SCM, WMS, CAD/CAM, GIS and others) or network tools available on the Internet.

The information resources gathered in enterprises can be divided, among others into quantitative and qualitative data. The quantitative data played a fundamental role in the company's management for a long period of time. It was mainly collected in ERP (Enterprise Resources Planning) systems as source data describing events occurring in enterprises. This data was subjected to aggregation processes, thanks to which highly processed data describing the economic situation of the company was obtained or used in decision models used in BI (Business Intelligence) systems. The mentioned data allow for the registration of the effects of occurring events and the assessment of the company's condition. Based on them, trends of selected economic phenomena can be estimated (eg analyze demand, examine the impact of employment dynamics on the volume of production or sales, the company's balance sheet and others can be drawn up). Due to the mentioned data, it is possible to prepare the reporting required by state regulations (eg for fiscal, statistical or social purposes). This data usually refer to historical events, although on their basis, it is possible to develop various types of plans, especially those based on market trends.

Qualitative data refer to the description of phenomena, objects, trends having a rather individual character. They consist in an informal description of a given information object. The description may have the character of an ordinary text document, but it may also be an image, a map, a photo or a multimedia material. The mentioned data may be the result of own actions, concerning, for example, trainings or results of own actions in the field of innovation, technical progress, creativity or entrepreneurship. However, most of them are usually of an external origin and are largely obtained through the Internet. About interesting in qualitative data look at [22]. Generally, qualitative data is usually used to acquire knowledge on the most important issues for the enterprise. Some of them can be obtained through contacts with various stakeholder groups (cooperators, clients, shareholders, and, in some cases, even competitors can provide knowledge about new technological solutions, proposals for joint ventures, planned or announced tenders and others - see among others [11]) or be the result of searching for appropriate types of information resources. Qualitative data may refer to diverse issues, which may be of strategic importance as well as tactical or operational. Strategic meanings may have, for example, economic analysis of the industry's prospects (which may, among others, affect to decide whether to merge with the current competitor or change the profile of the business). Another consequence may be entering the cooperative system and adopting a process approach in the organization of the company's operating principles. However, the operational significance may have a comment contained in the complaint form or an opinion about a given product or employee, for example, left on one of the Internet portals.

Quantitative data is usually owned by enterprise and it is stored in ICT tools at their sole disposal (eg in ERP / BI systems) [4]. Qualitative data about internal genesis will also belong to the enterprise, but will be stored in documentbases. However, the external data can be obtained from the Internet using a variety of acquisition and processing tools (for example BigData [1], semantic tools [21] or sentiment analysis [25]) while respecting the ownership of them.

Quantitative data at the beginning of their collection were of a domain character, they

referred only to selected areas of the company's activity. It was only with the development of MRP and then ERP systems that integrated IT systems with a common database for all areas of activity appeared. For the mentioned domain, the challenge was the process approach to managing organizations, which is in opposition to the functional approach for which IT systems have been built so far. The problem consisted in the need to connect operations belonging to the same process instance. As part of ERP, individual operations were different types of primary events (usually assigned to individual areas of the company's activity) in business processes recorded in the process models covering many areas of the company's activity.

Meanwhile, qualitative data is by definition not formalized and may also refer to different areas of activity. They may include data about the past (for example the quality assessment of products or services) as well as neutral resources that may become an inspiration to take up new areas of the company's operations.

Like quantitative data, the qualitative data may relate to different areas of activity. Interdependence between the quantitative and qualitative description is presented, *inter alia*, in [15]. The mentioned data can be registered independently of each other or constitute information resources of the Internet network and be used incidentally. Analyzing individual areas of business operations and the principles of their functioning for research purposes, eight basic areas were adopted within which qualitative data are collected (compare [4]). These included: training materials, knowledge-gathering sets (mainly in the field of potential innovation or implementation of scientific and technical or organizational progress) [12], technological documents and descriptive quality control results, evaluation of manufactured goods and services (both internal and external to customers, cooperating, as well as competition), gathering all types of comments regarding a given company, various types of documents or benchmarking comments, documents gathered in CRM (Customer Relationship Management) class systems and documents subject to registration and processing as part of an automated documentation flow system in an enterprise. The studies did not only close on the eight areas, so the respondents could add areas characteristic of their enterprises. It is worth adding that the qualitative data from the eight areas differ, among others in terms of content, context, source of origin, principles of collection and processing or accessibility (including copyright).

Analyzing the specifics of qualitative data, one should pay attention to the fact that a significant part of them can be created without the knowledge of a given company. In addition, part of the qualitative data in the course of their creation does not refer in any way to the activity of the enterprise. They are usually obtained due to the fact that the relevant services in the company they consider useful [14]. The problem is that the Internet network resources are constantly growing, and searching them takes more and more time. Meanwhile, users do not always have specific information needs, hence it is not always known what type of data they will need.

In addition, when comparing quantitative and qualitative data, it should be noted that the former ones are usually formalized and organized, while the second ones can be registered in various formats, structures, contexts and will usually have informal content.

From the point of view of management, both types of data complement each other. While quantitative data allows mathematical and statistical description of the economic condition of the enterprise, the qualitative data allows, among others: the protection of the company's brand, facilitate creativity and innovation, allow for the relationship with stakeholders in a broader context (not only in terms of transactions or transfers). In addition, qualitative data requires other ICT tools to collect and process them.

### **3. Research methodology**

As already mentioned, the research presented in this study is part of a larger whole. In the research assumptions it was assumed that the ICT tools market is dynamically developing, constantly increasing its offer. At the same time, the principles of organization and market behavior are subject to transformation. In turn, for users, the use of information resources, including qualitative data, should be consistent with the economic calculation. As a result,

it can be assumed that the discussed research complex is a conglomeration of organizational, functional, information, technological and financial factors. There is interest in researching qualitative data in various fields of life, e.g. in fisheries management [3], medicine [9] or sport [8] and using qualitative methodology [6].

The research presented in the article was preliminary. Its purpose was to identify qualitative data collected in enterprises and to assess in what areas of the company's activity they are used, and whether they are useful at various levels of decision-making processes. Other factors, in particular technological and financial ones, will be brought up in further research on the discussed issue.

Due to the fact that the research is of identification nature, their purpose has been limited to the recognition of the current state of using qualitative data. The range of interest includes what type of qualitative data is collected, at what decision-making levels they are used and in which areas of activity.

Due to the fact that it was expected to indicate many types of qualitative data, their classification was based on [7]. At the same time, it was possible to indicate other types of data if the proposed classification proves to be insufficient. The areas of the company's activity have been distinguished on the basis of ERP class system modules. They were selected basing on the analysis of several systems available on the market. In the literature, exemplary transaction modules have been mentioned, among others in [11].

The research based on typical qualitative methods [16] and was carried out using a questionnaire, which was used to conduct the survey. The questionnaire contained several questions that referred directly to the phenomena studied. The responses were of a stating character or an evaluator. The statements consisted in indicating that a given phenomenon occurs. On the other hand, the grades were to indicate how strong the phenomenon is. It has been assumed that the grading scale is even, therefore it is legitimate to count statistical indicators, such as, for example, the arithmetic average.

For the research it was attempted to select the broadest possible range of types of business entities. Due to the fact that the research was of an identification nature, the number of respondents was not very large and numbered 68 entities. However, it was tried to ensure that the entities subject to the research were diverse. The structure of the size of the surveyed entities is presented in Table 1.

**Table 1.** The cross-section of enterprises that were tested

The size of the enterprise	Number of enterprises	Percentage
<b>0-50</b>	25	37
<b>51-300</b>	21	31
<b>301-1000</b>	15	22
<b>Over 1000</b>	7	10

Source: Own study based on research results.

The research results should allow to make the inventory of the current state of using qualitative data in enterprises. They indicate what kinds of qualitative data are used in enterprises and what role is assigned to them. At which levels of management they are used. In addition, they show in which areas of the company's activity they are applied and how their usefulness is assessed. Summing up, the results of the research allow to assess the needs in terms of the application of the appropriate types of qualitative data and in which areas of activity of enterprises they are useful.

#### 4. Test results

This article presents the results of the survey referring to the purpose of this study. Five questions were selected from the questionnaire, which relate to the subject discussed. The first question concerned determining the role of qualitative data within eight designated

areas. Moreover, as mentioned, the respondents could also indicate that there are other areas of application of qualitative data which were contractually accepted as the ninth additional area. The role of qualitative data within particular areas should be assessed on a scale of 0 to 5 (0 - it meant no role, and 5 - a key one). Role assessment of qualitative data in each area is presented in the form of four parameters:

- the sums of the points obtained,
- average arithmetic,
- dominants
- what percentage of respondents indicated the dominant rating.

The results of the answer to this question are presented in table 2.

**Table 2.** Results of the role of collected qualitative data.

Qualitative data areas	Sum of grades	Arithmetic average	Dominant	Percentage
Training materials	214	3,15	5	30
Knowledge gathering	179	2,63	3.5	21
Descriptive results of quality control	228	3,35	5	41
Evaluation of products or services provided	248	3,65	5	51
Comments	154	2,26	2	22
Benchmarking	164	2,41	2	22
Customer Relationship Management	175	2,57	5	24
Automated documentation flow	193	2,84	5	25
Other types of electronic documents	106	1,56	0	25

Source: Own study based on research results.

The second of the analyzed questions the is usefulness of qualitative data in decision-making processes. The analysis concerned all levels of management, broken down into individual areas described by qualitative data. The respondents, on a binary basis, were to determine whether the indicated types of qualitative data are used in making decisions (strategic, tactical or operational). The results of the research are presented in table 3.

**Table 3.** Declared use of qualitative data in decision-making processes.

Qualitative data areas	Strategic level		Tactic level		Operational level	
	Number	%	Number	%	Number	%
Training materials	13	19	32	47	27	40
Knowledge gathering	14	21	18	26	24	35
Descriptive results of quality control	22	32	18	26	29	43
Evaluation of products or services provided	15	22	21	31	36	53
Comments	15	22	22	32	25	37
Benchmarking	12	18	11	16	16	24
Customer Relationship Management	13	19	15	22	26	38
Automated documentation flow	11	16	25	37	33	49
Other types of electronic documents	3	4	13	19	14	21

Source: Own study based on research results.

The next question concerned the usefulness of qualitative data in enterprise management. In this case, the qualitative data was treated as a whole, and the usability evaluation could take the value from -5 to 5. Negative values were assumed to have a detrimental effect on business management, 0 meant that there are no effects, and 5 meant

a key positive impact. The results of the answer to the above question are presented in Table 4.

**Table 4.** Declared assessment of the usefulness of qualitative data in management processes.

Assessment of the usefulness of qualitative data in management processes											
Value	-5	-4	-3	-2	-1	0	1	2	3	4	5
Number	0	0	1	0	0	6	2	5	20	15	19
Percentage	0	0	1	0	0	9	3	8	29	22	28

Source: Own study based on research results.

The consequence of the previous question is whether the role of qualitative data is appreciated by the company. The assessment is made in a similar way to the previous question. Rating -5 means that the qualitative data is overestimated, 0 means that the current state is adequate to reality, while 5 means that the role of qualitative data is underestimated, which means that a wider use of qualitative data could increase management efficiency. The results are shown in Table 5.

**Table 5.** Appreciation of the role of qualitative data in management processes.

Appreciation of the role of qualitative data in management processes											
Value	-5	-4	-3	-2	-1	0	1	2	3	4	5
Number	1	1	2	0	0	9	5	9	17	11	13
Percentage	1	1	3	0	0	13	8	13	25	17	19

Source: Own study based on research results.

The last of the analyzed questions concerned the areas of activity in which qualitative data are used. In this question respondents could indicate the role of qualitative data on a scale from 0 to 5, where 0 meant no qualitative data, while 5 meant a key role. In the case of this question, not everyone marked the answers in all areas. This may have resulted from the fact that the given area does not exist in a given company or respondent it was difficult to say if the qualitative data is used in a given area. Therefore, in Table 6, the number of entities referred to the area was entered, and then the percentage share according to the grades was indicated.

**Table 6.** Application of qualitative data in the areas of business activity.

Areas of business activity	Number of respondents	Ratings in percent					
		0	1	2	3	4	5
Marketing	53	2	0	4	19	21	54
Supply	62	8	11	7	16	16	42
Warehouse management	59	12	8	15	22	14	29
Quality control	62	6	2	6	12	21	53
Technology	62	5	3	8	16	28	40
Production	63	16	0	5	13	17	49
CRM	55	16	7	7	20	16	34
Sales and distribution	64	8	11	12	16	22	31
Recycling	46	20	15	11	15	13	26
HR and payroll	54	8	13	18	17	18	26
Economic analysis and planning	51	4	4	8	29	26	29
Finances and accountancy	58	9	12	3	19	35	22
Process management	62	8	3	11	21	18	39
Organization management	56	0	7	7	23	25	38

Source: Own study based on research results.

The presented results allow for a preliminary analysis of the use of qualitative data in business management. Despite the diversity of entities, both in terms of the size of the enterprise and the business profile, in principle, in most of the surveyed enterprises, their usefulness of processing was pointed out. useful.

## 5. Interpretation of research results

As mentioned above, the aim of the research was to identify the role of qualitative data in business management. In the background, the question arose whether the role of qualitative data is so important that it will require developing appropriate system solutions in the near future. These solutions should cover both usability issues (defining standards for collected data, processing and retrieval rules, as well as communication between qualitative and quantitative data), as well as technological issues related to the development of ICT tools. Interpretation of the qualitative data studied may be multi-directional. An appropriate methodology is presented in [2]

From the obtained research results, it is possible to estimate the current interest of enterprises in the use of qualitative data in management processes. The research results indicate what types of qualitative data are considered the most useful in management, at what decision-making levels they are used and in which areas of business activity. The basic conclusion from the research is that the qualitative data is used in practically every company. However, there is a diversification as to the types of qualitative data used in enterprises and areas of their applications.

Analysis of the results obtained under the first question indicates a relatively high interest in qualitative data. It fluctuates within the range of 2.26 - 3.65, and only in the case of two areas it has fallen below the half of the range (value 2.5), ie. the comment was rated at 2.26 and benchmarking at 2.41. Other areas should be treated as significant from the point of view of business management. Undoubtedly, the results were also influenced by the diversity of entities which can be seen in the area of "knowledge-gathering collections" where there were two dominant grades 2 and 5.

When examining in detail the results obtained, it should be assumed that the most important qualitative data is attributed to the issues of quality and knowledge. The highest importance was attributed to the qualitative data on "Evaluation of products or services provided". The second most important area was "Descriptive results of quality control" and the third "Training materials". It follows from this that in most enterprises greater value is attached to qualitative data relating to the collection of own information resources or expert studies that are the carrier of knowledge. It can be assumed that the management of enterprises is influenced by knowledge management concepts [20]. However, it may seem surprising that definitely less importance is given to signals from the environment. The areas rated "Comments", "Benchmarking" and CRM were rated the lowest. Considering that the results in these areas were characterized by high diversity, one can assume that the problem may lie in tools used for automatic data processing. At the end of the analysis of the first research topic it can also be assumed that the division into the areas of qualitative data types has been made correctly which confirms the results that in the "other types of electronic documents" the assessment was the lowest (average arithmetic 1.56, and the dominant was 0).

The second of the issues examined concerned the use of qualitative data in decision-making processes. The obtained results indicate that this is not a common phenomenon. Qualitative data is used to make decisions mainly at the operational level. Relatively less often at the tactical level, and even less commonly at the strategic level. It follows that qualitative data is used for decision-making processes mainly in those entities where ICT tools are appropriate. Going in details, as already mentioned, the most qualitative data is used at the operational level. The most frequently used areas are "Evaluation of products or services provided" - 53% and "Automated documentation flow" - 49%. In the latter case, it is logical in that it usually refers to reactions to various types of applications, proposals or complaints, and sometimes requires taking operational decisions as a reaction to higher-

level decisions. Qualitative data from other areas are used at the operational level of 21 to 43%. At the tactical level, the most commonly used qualitative data are "Training materials" - 47%. It follows that the orderly knowledge provided to employees plays an important role at this level. The "Automated documentation flow" area is also relatively important - 37%, for similar reasons as at the lower level. However, other areas are used in 16 to 32% of the surveyed enterprises. At the strategic level, "Descriptive results of quality control" was indicated as the most frequently used area of qualitative data. Data from this area is used in almost 1/3 of the surveyed enterprises. It can be said that in these enterprises one of the significant distinguishing features of their activity is the quality of services or products offered. The significance of quality issues in the issues discussed [24] or a process approach to management [23]. The remaining qualitative data area is used in over ten percent of the surveyed enterprises. Analyzing the obtained results, it can be concluded that the correct conclusion is that for the management of the enterprise, the qualitative data concerning its internal organization is more important.

Answers to two more questions indicate that enterprises notice the usefulness of qualitative data in management processes. This is confirmed by the fact that 79% of answers were rated 3, 4 and 5 (in scale from -5 to 5). However, when it comes to appreciating the role of qualitative data, 61% of responses were in the same range. There is a certain dissonance indicating that on one hand the roles of qualitative data are recognized, but practical solutions in the discussed area will require improvement. There are some indications in the form of negative evaluations that may give some thought. It can be presumed that this is a drawback to the fact that abstraction from qualitative data in management processes can have negative effects on the company.

The results of the answers to the last of the analyzed questions indicate that qualitative data may be applicable in virtually all areas of the company's operations. In this case, their use may depend on many factors, such as, inter alia, the size of the enterprise, ICT infrastructure owned or the level of organization development. In addition, not all of the areas of activity highlighted in the research may occur in individual enterprises.

By analyzing the results in detail, it can be said that the qualitative data is considered to be a very useful information resource. The respondents in the question were not only supposed to determine if the qualitative data was used within the given area of the company's activity, but also to determine their usefulness on a scale of 0 to 5. Looking from the point of view of the number of entities demonstrating usefulness, the most-indicated area was 'Sales and distribution' - 94%. Similar results were obtained in the areas of "Production" - 92% and "Supply", "Quality control", "Technology" and "Process management", 91% each. Each of the remaining areas of the company's activity was distinguished by a minimum of 2/3 of respondents. Looking at the obtained results, it can be assumed that the qualitative data refer mainly to the quality, the implementation of the business and possibly the process approach to management.

It is also worth paying attention to the fact that if the usefulness of the qualitative data in a given area was already pointed out, the most common was the score 5 (on a scale of 0 to 5). The only exceptions were the areas: "Finances and accountancy" and "Economic analysis and planning". But these areas are traditionally associated with quantitative data. In this case, the dominants were 4.

## **6. Conclusions and further research plans**

The purpose of the article is to present the role of qualitative data in business management. The aim was to identify specific qualitative data types that are used in enterprises and in what areas of activity they are used. Based on the obtained results, one can indicate what type of qualitative data are the most desired in enterprises and where they are used.

The obtained results of the study not only proved the seemingly obvious thesis that qualitative data is used in enterprises, but first of all they indicated what type of data is most desirable and in what areas are most commonly used. Generalizing the results of the research, it should be noted that at the moment enterprises are focused on acquiring qualitative data regarding the quality of operations, collecting corporate knowledge and



implementing the process approach.

The meaning of qualitative data in decision-making processes is relatively low and refers mainly to the low level, i.e. the operational level. For the other decision-making levels, aggregated quantitative data seem to be of basic importance. The conducted research is not about contrasting quantitative and qualitative data. On the contrary, their aim is to seek to fill the information gaps in the quantitative data with relevant qualitative data. This could indicate that the problem is the qualitative data processing systems, which would allow to obtain appropriate information resources based on the automatic processing of qualitative data (which can be implemented using such tools as: semantic tools [5], sentiment analysis, spatial analysis [19], mind maps [13] and other). However, the tools mentioned above have their specificity, which is why the obtained results show where the quantitative data is used, and at the same time in which areas one can take actions aimed at their wider application. The obtained results may be useful both for the management of enterprises and IT companies preparing software for processing qualitative data.

The approach presented in the article has some limitations. As mentioned, the research, the results of which are presented in the article refer to the initial, identification phase. Their aim was to familiarize with selected aspects regarding only the thematic scope of qualitative data used in enterprises and the current state of their use. Therefore, a relatively small number of entities were surveyed. However, the obtained results allow to indicate some regularities in the use of qualitative data in enterprises, thanks to which further research threads can be planned. Undoubtedly, the presented material lacks a technological aspect, but this one will be the subject of further research, and the results obtained should allow for their better preparation.

The obtained test results seem to confirm the need for conducting in-depth studies on the need to use qualitative data in company management [10]. It seems that from ICT tools currently available on the market can be built integrated systems that will process qualitative data on the one hand, and on the other, appropriate data extracts will be used for integration with quantitative data needed to support management processes, especially at higher decision levels, i.e. tactical and strategic ones.

## References:

1. Acharya A., Singh S.K., Pereira V., Singh P.: Big data, knowledge co-creation and decision making in fashion industry. In *International Journal of Information Management*, Volume: 42, pp. 90-101, DOI: 10.1016/j.ijinfomgt.2018.06.008, Published: October (2018).
2. Austin Z., Sutton J., *Qualitative Research: Data Collection, Analysis, and Management*. In *The Canadian Journal of Hospital Pharmacy*. May – June 68 (3), pp. 226 – 231, (2015).
3. Barclay k., Voyer M., Mazur N., Payne A.M., Mauli S., Kinch J., Fabinyi M., Smith G., The importance of qualitative social research for effective fisheries management. *Fisheries Research*. <https://doi.org/10.1016/j.fishres.2016.08.007>, Volume 186, Part 2, pp. 426-438, February (2017).
4. Bozic K., Dimovski V.: Business intelligence and analytics for value creation: The role of absorptive capacity. In *International Journal of Information Management*, Volume: 46, pp. 93-103, DOI: 10.1016/j.ijinfomgt.2018.11.020, Published: June (2019).
5. Cob C., Abdullah R., Risidi H. and Mohd N.M., “Preliminary study on semantic knowledge management model for collaborative learning”, *ARPN Journal of Engineering and Applied Sciences*, Vol. 10 No. 2, pp. 442-450. (2015).
6. Cornelissen J.P., *Preserving Theoretical Divergence in Management Research: Why the Explanatory Potential of Qualitative Research Should Be Harnessed Rather than Suppressed*, In *Journal of Management Studies* 54 (3), doi: 10.1111/joms.12210, pp. 368 – 383, May (2017).
7. Dal Bern Pires L.A., da Cruz Urpia A.G.B., Massuda E.M.: Analysis of the practices of knowledge management of technological and functional basis in image clinic. *Navus-Revista De Gestao e Tecnologia*, Volume: 9, Issue: 2, pp. 159-172, DOI: 10.22279/navus.2019.v9n2., pp 159-172.767, Published: April-June (2019).

8. Hoerber L., Shaw S., Contemporary qualitative research methods in sport management. *Sport Management Review*. <https://doi.org/10.1016/j.smr.2016.11.005>, Volume 20, Issue 1, pp. 4 – 7, February (2017).
9. Houghton C., Murphy K., Shaw D., Casey D., Qualitative case study data analysis: an example from practice. *Nurse Researcher*. doi: 10.7748/nr.22.5.8.e1307, 22, 5, 8-12, 16 April (2014).
10. Javed M., Kamal S.: Normalization of Unstructured and Informal Text in Sentiment Analysis. In *International Journal of Advanced Computer Science and Applications*. Volume: 9, Issue: 10, pp. 78-85, Published: October (2018).
11. Korenková V., Závadský J., Lis. M.: Linking a performance management system and competencies: qualitative research, "Engineering Management in Production and Services", vol 11, iss 1, pp. 51-67. (2019).
12. Königová, M., & Hron, J., Methodology for the identification of managerial competencies in knowledge-based organizations. *Agricultural Economics*, 58(8), pp. 347-353. (2012).
13. Mammen J.R., Mammen C.R.: Beyond concept analysis: Uses of mind mapping software for visual representation, management, and analysis of diverse digital data. *Research in Nursing & Health*. Volume: 41, Issue: 6, pp. 583-592. DOI: 10.1002/nur.21920, Published: December (2018).
14. Matayong, S. and Mahmood, A.K.: The review of approaches to knowledge management system studies. In *Journal of Knowledge Management*, Vol. 17 No. 3, pp. 472-490, (2013).
15. Mayer I., Qualitative Research with a focus on Qualitative Data Analysis. In *International Journal of Sales, Retailing and Marketing* Vol. 4, No. 9, pp. 53 – 67, (2015).
16. McNabb D.E., *Research Methods in Public Administration and Nonprofit Management*. 3rd Edition, <https://doi.org/10.4324/9781315701127>, New York, Imprint Routledge, eBook Published 1 June (2015).
17. Miles M.B., Huberman A.M.: *Qualitative Data Analysis: An Expanded Sourcebook*. SAGE Publication Inc. (1994).
18. Stair R., Reynolds G.: *Information Systems Essentials*. Fifth Edition. Edited by Course Technology. (2010).
19. Stepniak C.: Fourth dimension of spatial description in business processes. In *Proceedings of the 19th International Conference on Computers (part of CSCC'15)*, Zakynthos Island, Greece, July 16-20, 2015, pp 157 – 162. (2015).
20. Tingwei G., Yueting Ch., Yi L., "A review of knowledge management about theoretical conception and designing approaches", *International Journal of Crowd Science*, Vol. 2 Issue: 1, 2018, pp.42-51, <https://doi.org/10.1108/IJCS-08-2017-0023>, (2018).
21. Vanharanta H., Kantola J., Markopoulos E., Salo M., Einolander J., Hanhisalo T.: The Degree of Agility in a Technology Company's Strategy, Management, and Leadership. In *Management and Production Engineering Review* Volume 9 Number 4 December 2018, pp. 129–137 DOI: 10.24425/119553, (2018).
22. White D.E., Oelke N.D., Friesen S.: Management of a Large Qualitative Data Set: Establishing Trustworthiness of the Data. In *International Journal of Qualitative Methods*. <https://doi.org/10.1177/160940691201100305>. First published, July 1, (2012).
23. Závadská Z, Korenková V.: *Procesný manažment: Teória a prax* (2017), Wolters Kluwer, (2017).
24. Závadský J., Závadská Z.: Utilisation of business process models in managerial practice: An empirical study in Slovak companies certified to the ISO 9001 standard. In *Total Quality Management & Business Excellence*. - London : Routledge, 2014. ISSN 1478-3363. roč. 24, č. 3-4 (2013), pp. 319-337, (2013).
25. Ziora L.: The Sentiment Analysis as a Tool of Business Analytics in Contemporary Organizations. *Economics Studies*. University of Economics in Katowice Research Papers., no 281, Katowice, pp. 234-241. (2016).