THE APPLICATION OF HETEROGENEOUS KNOWLEDGE SOURCES IN MUNICIPAL MANAGEMENT

DOI: 10.33141/po.2019.10.05

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Introduction

Not only charisma and leadership abilities, but also managerial skills are now required from contemporary leaders of local government units. Although the basic purpose of state and local government bodies activities is to issue administrative decisions, the leaders are required to create a strategy concerning the development of subordinated entity, as well as to possess the ability to meet the current needs of its residents. The assessment concerns not only the cost-effectiveness of spending public funds, but also the condition of the entity compared to other entities of the same type. The political factor is significant here as well. The functionality of communes may be influenced by many groups of interests which can stay in a form of different types of relations.

The management of local government entities has its own specificity, which is additionally framed by relevant legal regulations. One of the characteristic features is the re-election cycle of the authorities in local governments. This means that local government leaders at all levels from time to time must submit to the electoral judgment. Then, they are usually held to account for not only economic performance, but largely on the basis of opinions about them. In this case, it is important for them to collect opinions about their own activities and how they are perceived by the inhabitants. The discussed issues have their theoretical references included, among others, in models of new public management, where the issue of municipal management can be perceived in various perspectives, e.g. economic, humanistic or relational.

Opinions of different stakeholders are not always verbalized. Some of them are held by voters only for themselves. Those that have been verbalized can take various forms, such as: text articles, notes, comments presented in text or multimedia versions. These data entirely constitute elements of qualitative data used to manage municipalities.

Modern IT tools allow to collect and process various types of data. In addition to the still important economic data and formalized data on administrative decisions, it is increasingly important to collect qualitative data. They concern, among others the needs of residents, ways of satisfying them and assessments of undertaken and carried out activities. These different types of data are sources of knowledge for the management of municipalities.

New types of IT tools are appearing on the market, and those already used are expanded with new functions. On the other hand, data records do not apply to all available resources. In principle, data records mainly concern systems supporting administrative decision-making processes and collected for the needs of management of municipal offices and their agencies. Meanwhile, stakeholders interested in the functioning of municipalities may generate or collect various types of data. On this basis, questions arise: what type of data should be collected and processed and whether available IT tools enable their processing. This paper refers to the issue of using new types of IT tools for municipality management. In this case, it concerned identifying different types of data sources that could then

be used to manage municipalities. To this end, research on potential data sources has been carried out. What is more, the authors tried to determine whether there are any premises for using such IT tools as Big Data or Sentiment Analysis.

In this paper, the subject of knowledge sources needed to manage communes, i.e. entities of the third-level local government in Poland, was taken under consideration. The Authors' team carried out introductory research in 47 municipalities in the northern part of the Silesian Voivodeship. The analysed research issues included e.g. the issue of information needs for the purposes of municipalities management as well as sources of knowledge and tools required for its acquisition. The aim of the paper is to present the results of the research concerning knowledge sources relevant to the management of municipalities, which could provide information resources for IT tools. The obtained results are aimed at identifying the current sources of knowledge, the scope of collected information resources in communes and a preliminary analysis of the applicability of the above-mentioned IT tools.

The specificity of municipalities management

The local government entity is, by definition, a kind of territorial and social community, which is endowed with specific laws within the scope of self-governance (The act on local government 1990, Art. 1). The management of local government entities is aimed at, among others:

- creating the regional development strategy,
- meeting the needs of residents,
- issuing administrative decisions in accordance with the competences held,
- asset management of the entity.

Local government units can be perceived from different perspectives and different goals can be assigned to them. B. Kożuch analyses the discussed issue from the perspective of economics and humanism (Kożuch, 2016, pp. 161–170). In this case, the key issue becomes whether the commune should be an entity solely driven by economic efficiency or the starting points are constituted by the social needs of its inhabitants. On the basis of economics, the ideas of New Public Management appeared (Czarnecki, 2011, pp. 5–19) or (Młodzik, 2015, pp. 185–193). The approach based on humanism assumes (Kożuch, 2011, pp. 161–170) a greater emphasis on the role of humans in the functioning of the community as well as the institutions managing it. The concept of a leader (usually politician) appears in this approach, the task of whom is to identify social needs, and then organize activities to satisfy them. In addition, there may exist various interest groups in the municipality that may compete or cooperate in an attempt to take over the power in the municipality. In this system, the question of relationship in society appears. Messages exemplifying these relations become important sources of knowledge that may be relevant to the municipality management.

One of the basic features of management in local government entities is the re-election of office authorities. The

leaders must take care of being positively perceived within local communities because their potential re-election depends on it (Electoral Code 2011, Electoral Code – change of the Act 2018). That is why the leaders have to take care of a constant positive image which steadily undergoes assessment (Śmietanka, 2016). The evaluation of commune board's work takes place in two ways. Every year, the management board should receive the vote of acceptance from its activities and every four years undergo an election procedure (Art. 18 the Act on Local Government). The annual evaluation of the commune board's work takes place on the basis of reports concerning the implementation of the planned tasks and budget. The assessment is made by the commune council on the basis of data collected in the IT systems of municipal offices, properly prepared in the form of reports (Jatkiewicz, 2016, pp. 39–52). It can be assumed that the assessment of work is influenced mainly by two groups of factors: political and formal ones. Political factors are associated with the composition of the commune council and its relationship with the leader. The formal assessment, on the other hand, is usually based on an analysis of the results obtained during a given year and concerns, inter alia:

- the evaluation of the budget implementation of the commune,
- the level of carrying out the undertaken commitments (mainly the effects of investment and current activities),
- the quality and efficiency of making administrative decisions in offices
- the efficiency of municipal units.

Typically, the basis for granting the vote of acceptance is the required proof of the implementation of the municipal tasks undertaken at a certain level with a possible indication of the reasons for the failures of the rest of planned activities.

The mentioned assessment can be made on the basis of processed source data collected in IT systems of subordinated offices. In these systems data are collected regarding administrative decisions taken, adopted budget plans and results of their implementation. On its basis, you can assess the economic aspects of municipal management by current leaders (Kulisiewicz, 2016, pp. 83–96).

In these considerations, the concept of leader is identified with the executive authority of the municipality – who is the president of the city – municipalities constituting large cities, usually over 50,000 inhabitants, often cities with poviat rights, mayors managing municipalities and commune administrators operating in rural communes.

The assessment through elections takes place according to less clear criteria. Many factors influence the popularity of leaders, which also have different meanings over time. Generally, it can be assumed that the electoral evaluation, which takes place every 4 years in Poland, is based on, among others, the following criteria:

- political,
- impact of interest groups,
- subjective criteria of residents,
- quality of communication between leaders and society.

In such a situation, classic IT systems are less important in the assessment of current or potential leaders. The relationship perspective in which the messages are entered

will be the subject of communication between various types of stakeholders in the municipality (selected forms of the relationship between stakeholders was presented by (Werenowska, 2018, pp. 312–319)). Election rivalry addresses such issues as election programme, charisma and credibility of the leader or the assessment of current management and the degree of satisfying the needs of the commune residents. All these issues from the point of view of the evaluation criteria have fuzzy character and are represented more in the form of opinions than specific values. In this situation, the number of positive opinions seems to be more important than the formal compliance of accounting results from reports on the performance of the commune's management. It also seems that it is important to obtain data of evaluative-comparative nature, i.e. not only whether the leader is well perceived, but how she/he is perceived against the background of potential competitors. There may also occur a phenomenon of information fight between the candidates to the office of the Leader or the commune council (Kryszk, 2017, pp. 137–146).

In practice, municipalities' management consists of two objectives fulfilment. The first of these is social, which should be manifested by striving to satisfy as much as possible as far as the needs of the local community are concerned. The second is a particular one, aimed at obtaining power by the leader and groups of interests supporting him. Typically, these interest groups represent specific visions of the development of a given region. In connection with the re-election self-governments functionality, the task of leaders is to convince as much of the local community as possible to the tasks carried out by the municipality's management. In turn, the task of the opposition is to indicate the management deficiencies demonstrated by the commune authorities and propose their own vision of the development of a given territorial entity.

The electoral rivalry relies on gaining supporters who will decide to vote for a given candidate in a timely manner. Assuming rationality of current or potential leaders, they should be focused on ongoing communication with voters and representatives of interest groups who are potentially or realistically interested in the activities in the commune. For the purposes of this communication, it is necessary to create messages describing various types of events taking place in the municipality, development plans, development strategy proposals, etc. It is important that these materials are distributed as widely as possible among residents and stakeholders interested in activities in the municipality. The websites of local government units may serve this purpose (Zdonek, 2013, pp. 385–399). You can add windows to the messages that allow you to receive comments. In practice, the more widespread the activity will be, the greater the curiosity directed towards systems enabling the analysis of collected materials will be. These tools can fulfil the role of social feedback, thanks to which both leaders and management boards of municipalities as well as potential opposition can obtain information about local moods. This applies both to personal assessments of individual members of the commune board, as well as to projects

undertaken by them. However, the mere collection of data may not be sufficient, which is why there is a need to apply the right tools in order to automatically process the collected information resources.

Heterogeneous sources of knowledge in municipal management

The tools used for automatic data processing require appropriate resources, and in turn for their acquisition data sources are needed on the basis of which it will be possible to create knowledge concerning the functionality of the commune. There can be many such sources. They may be formal and informal.

As mentioned above, the majority of formalized data collected in state or municipal IT systems are used for the annual evaluation of the commune leaders. During the electoral verification, various knowledge may be collected, which may additionally be subject to opinions, for example with the help of comments which may reflect the mood prevailing in the municipality in relation to various aspects of its socio-economic life. It may also be a discussion about important issues for the residents of the commune. Different attitudes and identify groups of interest can then be confronted. Collection of informal data can take place in a very different way. Data can be collected on the basis of events (e.g. commissioning of a commune road) or on the basis of records from rural or estate meetings. They can be stored in various types of magazines, both paper and electronic, provided that they refer in any way to the subject related to a given municipality. Another type of source can be electronic communities within the framework of which various entities are interested in running business in the municipality and which can cooperate one with another. Taking into account the need to collect and share the knowledge of offices with residents, Open Government Data initiatives appeared (Papińska-Kacperek, Polańska, 2015, pp. 191–202]. However, in practice, the municipalities run their own computerisation policy and determine what type of data are subject to records (Ludzia, 2016, pp. 115–125).

The variety of knowledge sources makes it difficult to describe them based on one criterion. In the present considerations typologies of sources were elaborated, following the results of the conducted research as well as earlier observations. As a part of the developed typology, the following five criteria were distinguished:

- knowledge providers,
- substantive scope,
- the level of transformation,
- format of knowledge recording,
- technological tools applied.

Description of these criteria is presented in Table 1.

Combinations of the above sources allow for collection of very diverse types of information resources in many respects. Part of the collected resources may be source data, others may be grouped or even partially processed. In practice, however, their automatic use requires the definition of registration and ordering rules. Moreover, taking

Table 1. Heterogenous sources of knowledge for municipality management purpose

Knowledge providers	Substantive scope	Level of transformation	Recording format	Technological tools applied
Leaders and municipality management Officials Interest groups Social organisations Residents Journalists and commentators	Description of events Administrative decisions Strategic assumptions Investment plans Research on residents' needs Publications and comments	Source data: official and non-governmental Analytical data Reports Investment plans Commune development plans Elaborations and proposals Comments and evaluation	Numerical Text Multimedia Maps	IT Systems Web services Business Intelligence solutions Big Data Semantic tools Spatial data Sentiment Analysis Data mining

Source: authors' study

into account that it can be registered in different places, data filtering mechanisms (Abramowicz et al., 2002) will be needed to obtain as many resources as possible for a given subject, and eliminate any duplicates.

The scope of knowledge resources

The complexity of municipal management issues has a large impact on the diversity of knowledge resources. It contains many issues. Firstly, they are designated by the Act on the administrative division of the State (Act), which defines the scope of competences assigned to municipalities, and in case of cities with poviats rights, it also defines relevant competences for the second level of self-government in Poland. Secondly, each of the tasks within the assigned competences in practice consists of many real and planned activities, and even only those ones which are considered. Thirdly, it is still necessary to maintain an appropriate level of support among the residents of the commune. As a result, the range of required resources may turn out to be very wide. On the basis of previous observations and contacts of the members of the authors' team with representatives of local government administration, a general scope of useful knowledge resources was defined. When determining it, the following assumptions were taken into account:

1. The purpose of the municipality's management is primarily to meet the needs of residents.
2. Leaders are accounted for in terms of their economic efficiency.
3. There exists a phenomenon of competitiveness between municipalities.
4. The need to develop a commune's development strategy together with the development of a plan (schedule) for municipal investments.
5. Consideration of various interest groups operating in the commune.
6. Building regional communities in the spirit of a sense of community.

Bearing in mind the scope of the required knowledge resources and diversity of data sources, the quantitative and qualitative aspects were taken into consideration.

Quantitative data is collected mainly in IT systems of commune offices and its subordinate organisations. They are stored in the IT systems of these entities and then processed according to the developed reporting, analytical or control procedures. It can be assumed that most of these systems use classic databases. The operation of higher information functions (including reporting, analytics or control) resembles the relations between ERP and BI class information systems (Konieczka ..., 2015).

In contrast, the use of qualitative knowledge resources is assigned the following objectives:

- inspiring,
- presentations and discussions on various investments, ventures, phenomena, events, etc.,
- commenting and rating,
- shaping opinions.

While the quantitative knowledge resources are of descriptive type, qualitative ones are to inspire and excite emotions. In turn, emotions are important during the elections.

Technological solutions

As far as technological solutions are concerned the heterogeneous knowledge sources can embrace such technologies as big data (on application of the mentioned technology in the public administration (Wieczorkowski, 2014, pp. 567–579)) and data mining solutions, business analytics including business intelligence systems, information systems, sentiment analysis tools etc. The term big data was defined and popularised by Doug Laney in 2001, Meta Group analyst and initially it embraced issues related to the three dimensions of rapid data expansion, i.e. its volume, velocity and variety (Lee, Sohn, 2016, pp. 25–26). In 2012, the Gartner Group introduced additional two dimensions relating to variability and complexity. M. Tabakow, J. Korczak i B. Franczyk (2014, p. 141) propose the definition of Big Data as „data sets which are simultaneously characterised by large volume, variety, real-time flow, variability, changeability, complexity, as well as require innovative technologies, tools and IT methods to extract new and useful knowledge from them”.

SAS Institute states the fact that the big data value depends on the use of large data sets and provides the use of multiple data sources to: „make better decisions, reduce time, reduce costs, create a new product offer” (SAS Institute). Big Data solutions as well as Business Intelligence systems may facilitate the process of business organisation management and especially support decision making processes at all its stages and levels (Jelonek et al., 2018 p. 195–198). What is more the virtualisation of resources acquisition processes might have positive impact on enterprises competitiveness (Jelonek et al., p. 320–327).

T. Davenport and J. Dyche (2013) claim that „the main value from big data does not come from data in their raw form, but from the results of their processing and analysis leading to conclusions, products and services which are derived from analyses”. Another knowledge source may be constituted by sentiment analysis. The sentiment analysis, which is also called analysis of opinions is the part of the text analysis, natural language processing, automatic linguistics, Big Data, business analysis and machine learning. It allows to collect and analyse opinions on a specific product or service and its online monitoring (Ziora, 2016, pp. 234–241). Nowadays one can observe the development of dictionaries used for the purpose of sentiment analysis which can classify statements and phrases due to the subject matter, and additionally allow for identification of words and statements expressing emotions. Examples of sentiment dictionaries which contain sets of words with positive and negative overtones are Bing Liu’s Opinion Lexicon projects (goo.gl/9rNgVy), SentiWordNet (sentiwordnet.isti.cnr.it) or MPQA Subjectivity Lexicon (goo.gl/Ia5iSm).

The research procedure and findings

The authors of this paper deal with the issue of the use of IT tools in public administration. The basis of this research was the question whether modern IT tools, especially those that use quality data, can be used to manage municipalities. Based on the identification of requirements for the use of modern IT tools, the issues of examining the sources and content of data that could be used to manage municipalities were undertaken. Bearing in mind the topic, the research was conducted in public administration units, including participation in a series of nationwide TIAPiSZ conferences organised by the Warsaw School of Economics. Most of the presentations were later published in the academic papers of this university (in 2018 the X conference took place). Other studies were also analysed, such as those presented by Damurski, et al. (2019). These studies dealt with a variety of issues related to the management of the municipality, the objectives of IT tools or stakeholder groups used in this. For the present research, the methodology and results of other authors as well as own experience were applied. However, the present research uses its own vision of the possibility of using selected tools, such as Big Data or Sentiment analysis, provided that appropriate data sources and verification are found whether these tools can be used and to what extent.

In 2017, they conducted research to determine the state of management of information resources in municipalities. The aim of the research was to determine the principles of obtaining data, its sources, methods and tools of its processing. In addition, attempts have been made to identify the knowledge of officials and people managing municipalities in the domain of tools used for automatic analysis of opinions expressed by local communities. The study covered the northern part of the Silesian Voivodeship – a total of 47 communes. The selection included the nearest geographically districts located in 6 poviats. It can be assumed that the selection was representative as it contained all types of communes that exist in Poland. In addition, it referred to various regional circles (some of the communes are Silesian, and some were once Lesser Poland).

The development of the research procedure was guided by own experience in cooperation with public administration units and non-governmental organisations, and the research experiments of the TIAPiSZ conference participants were used. During the preparation of the research, the limitations were taken into account. First of all, the contemporary offices of the commune, especially cities with poviat rights, are organisations employing hundreds of employees working in various departments. They have an extensive organizational structure and cooperation between these units is not always visible. This is especially evident when they do not use the same IT systems or other IT tools. In addition, part of the information resources may be encumbered with the security classification. Secondly, not all information relations pass through public administration offices. Some of them take place within other stakeholder groups. In this case, a question arises which IT tools are used for these relations and whether the data being the subject of communication can be used publicly. The research was of a preliminary, pilot nature which in the future will allow for further work on computerization of municipal offices, especially in the field of data quality management. The research was conducted by means of a directed interview made in most cases by telephone calls, while in some cases the interview was of a direct nature. The respondents in most cases were employees of commune offices, employed as secretaries, mayor’s deputies or mayors, and sometimes the information obtained was supplemented by employees from IT positions.

A questionnaire was developed for the research purpose, which constituted a scenario for the interview. The main areas of research included questions related to: data collection for municipal management purpose (concerning, inter alia, building commune’s strategy, investment needs, research on residents’ needs), collecting and analysing local residents’ opinions concerning local communities, collecting them in an electronic way, thematic areas of collected data, the application of sentiment analysis tools and sources of data acquisition.

The main purpose of the research was to examine the current state of knowledge management in municipalities. It was carried out by striving to become acquainted with

the existing information needs for the purpose of managing municipalities and to examine the possibility of using selected types of IT tools. This study presents a section of research in which the main focus is put on the possibilities of using Big Data and sentiment analysis technology. The obtained data have quantitative and qualitative character. Quantitative data describe in what scope and what type of data are gathered (in how many communes), and qualitative data contain comments and justification of a current state. The study of knowledge sources in municipalities was aimed at identifying them, as well as checking whether there are technical grounds for using sentiment analysis tools. Sentiment analysis tools are mainly based on text data in electronic form. It is also possible to use multimedia data, on condition that they can be transformed into a textual form.

Therefore, the basic potential areas and technologies that could constitute sources of data were determined as:

- Social media.
- Local portals with comment systems.
- Content of electronic e-mails sent to offices and subordinate entities.
- Electronic systems of complaints collection.
- Contents of council interpellations, citizens' requests.
- Electronic voting and surveys, e.g. on the citizen's budget.
- Content of applications for subsidies, grants, etc.
- Recordings and reports from rural or residential meetings.
- Local publishing, periodicals, BIP along with comments on the materials posted.
- The content of informal talks and opinions that have been published in any electronic form.

Each of the above-mentioned examples of knowledge sources can be used by technologies that allow the collection of data resources and have a specific overtone (opinion on the particular issue).

Leaders, interest groups, officials and residents sharing opinions on a specific topic, submitting applications, interpellations, or participating in voting for a specific task in the citizen's budget, leave in the information systems specific expressions that reflect feelings, needs and opinions. Despite the heterogeneity of sources, analytical tools allow to indicate the context of expression and emotional colour of residents' opinions.

While studying the sources of knowledge, various types of data were analysed, both quantitative and qualitative ones. Based on the interviews conducted, it can be stated that quantitative data is registered electronically in all (47 units) examined offices. However, there may be areas in which records can be made both by paper means and electronically, and even only in paper form. This may be due to the fact that petitioners submit applications in the classical way and receive administrative decisions in the same way. It may also happen that the petitioner received a paper version, but its description is stored in the information system of the commune office. The review of IT systems collecting qualitative data in administration is presented in (Wieczorkowski, 2013, pp. 343–352).

In most areas, data is collected in information systems based on primary events. However, its elaboration is usually performed for the purpose of state reporting. In some cases, selected types of reports are prepared at the request of the Leader or one of his deputies or a commune council. However, this is mainly of an industry nature. Looking from the point of view of the possibility of using Big Data or sentiment analysis tools, both source data and processed data give rather limited possibilities of its usage, unless there is a possibility of open commenting on the content in these studies.

Qualitative data is by definition better suited to the use with Big Data technology or the sentiment analysis.

However, the condition for the use of these tools is:

- systematic collection of qualitative data,
- rational data classification prepared under the account of the criteria for potential analyses,
- reporting by leaders the demand for a particular type of analysis,
- having appropriate knowledge about the tools discussed
- collecting appropriate quality data (Maślankowski, 2015, pp. 168–177).

The behaviour of municipalities in the collection of qualitative data resources is presented in Table 2.

Table 2. Research findings concerning collection of inhabitants' opinions in the form of qualitative data

The problem	The number of municipalities	Percentage share
Does the commune collect the opinions of residents	40	85
Are the opinions collected in a systematic way	28	60
Are the opinions collected in electronic form	29	62

Source: authors' study

The obtained results indicating that 85% of municipalities is collecting opinions seems to be overstated. Due to the research capabilities, it was not possible to determine in which specific areas opinions of residents are collected. On the other hand, the surveyed respondents stated the fact of collecting qualitative data, even in case when it took place only in one area. In practice, this may mean that the use of these IT tools may only be of a random nature. In addition, the possibility of using Big Data tools and analysing the sentiment is weakened by the fact that only about 60% do it systematically, and 62% by electronic means. It should be remembered that not all communal offices have been required to provide at least comprehensive data digitisation. The results of the research on specific data sources of a qualitative nature, which are collected in the analysed communes, are presented in Table 3.

Table 3. Qualitative type data sources

Data source	The number of municipalities	Percentage share
Surveys and electronic forms	37	78
Local magazines	27	57
E-mails	36	76
Social Media	25	53
Office documents	22	47

Source: authors' study

The results presented also refer to the situation when municipal offices declared the use of specific sources, but it was not specified to which areas it refers. Therefore, data collected through indicated sources, although important from the point of view of Big Data's use or sentiment analysis, are not yet adequately collected and organised. It seems that the answer to these problems could be building electronic regional communities. The concept of these communities is generally perceived positively. However, the construction of these communities could be helpful to organise thematically the collected qualitative data resources.

Conclusions

The results of the conducted research show that municipal offices are increasingly equipped with the required IT systems. However, for the time being, the informatisation effort was directed mainly towards the accumulation of quantitative resources, especially where in many areas commune offices have legal obligations in this area. However, while the issue of the necessity of good communication between the leader and the inhabitants of the commune is appreciated, problems in acquiring new information technologies continue.

Summarising the results of the conducted research, it can be concluded that:

- in municipalities there is an awareness of the need to acquire more and more sources of knowledge,
 - some activities are even undertaken, including the implementation of new IT tools.
- However:
- there is a lack of knowledge about the tools discussed in the environment of the leaders (only in two communes the notion of sentiment analysis was known),
 - leaders are not fully aware of the need to increase the scope of collected data and would not be able to use them (in most communes, the municipality's development strategy is being developed due to formal requirements and with a relatively small proportion of public consultations),
 - there is also a financial barrier.

The obtained results indicate that in municipalities the collection of quantitative data is a standard. However, it is only the need to collect various types of qualitative data. There are no clearly defined needs in this area, therefore the data collected is rather random and largely dependent on the local specificity. Based on the obtained results, it can be stated that

during the research there were relatively small possibilities of implementing sentiment analysis tools in municipalities. It resulted from several factors, which include, among others: low knowledge concerning the discussed tools, lack of strictly defined rules for collecting qualitative data, lack of developed criteria for the development of the results of the sentiment analysis, as well as the financial barrier. Therefore, it can be assumed that, in addition to scientific objectives, the conducted research has achieved some educational effects and may influence the popularisation of knowledge, especially concerning the tools used for sentiment analysis.

The development of IT technology will result in the computerisation of relations taking place in environments responsible for the management of municipalities. However, it should be remembered that various types of stakeholders can participate in the management of municipalities. While the actions of public administration offices will be based on issuing administrative decisions and gathering more or less structured data, the remaining stakeholders may generate various types of data, which in turn may be collected in various forms and in various IT tools. The assumed goals of further work include identifying and organising data that may be useful for managing municipalities and improving relations between various stakeholders, as well as searching for new IT tools that could be used in the presented issues.

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Zastosowanie heterogenicznych źródeł wiedzy w zarządzaniu gminami

Streszczenie

Zarządzanie jednostkami administracyjnymi posiada swoją specyfikę. W przeciwieństwie do zarządzania przedsiębiorstwami celem zarządów gmin jest zaspokajanie potrzeb mieszkańców, organizowanie funkcjonowania społeczności lokalnych przy zachowaniu racjonalności ekonomicznej. Dla liderów społeczności istotną kwestią jest kadencyjność pełnienia funkcji, co powinno być dodatkowym czynnikiem sprzyjającym ich współpracy z mieszkańcami. Jednym z warunków współpracy między liderami i lokalną społecznością jest odpowiedni poziom komunikacji. W niniejszym artykule przedstawiono problematykę źródeł danych niezbędnych w ramach wspomnianej współpracy. Rozważania przeprowadzono na podstawie badań empirycznych przeprowadzonych w 47 gminach województwa śląskiego. W rozważaniach analizie poddano dostępne współcześnie narzędzia IT (głównie Big Data i analizę wydźwięku oraz różne typy systemów informatycznych stosowanych w urzędach gmin) oraz zasoby informacyjne, jakie są lub mogą stanowić źródła wiedzy w zarządzaniu gminami.

Słowa kluczowe

zarządzanie gminami, źródła wiedzy, Big Data, analiza wydźwięku