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## Data analysis in process of energetics resource optimization

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### Abstract

The distribution and management of energetic resources are the source of big amount of data in structured or unstructured form. These data are collected in a targeted or a random fashion manner for the purpose of efficient distribution and management in the required timeframe. Urban as well as industrial complexes are typical environments where are generated these data. In this process, there are data that are deliberately collected in order to generate the required reporting and outputs for management decision. Input data are the basis of reporting which can have simple or detailed format. In this work we are collecting random input data with intricate structure that cannot simply interpreted and explain in relation with others. The topic of our paper is focused on the interpretation of collected data that is oriented to energetic resources in regional city. We are describing the process of data collection, data cleaning, analysis, identification of relations, informational links, visualization, and interpretation. By analysis of these data we propose information value, which can be exploited in management decision to reduce the cost of electricity and the gas there.

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### 1. Introduction

Numbers, numbers and numbers again. In this way, it is possible to present the environment in which the manager is present before executing his planned, unplanned or strategic decision. Success in management depends on the quality of the decision process and its content, that is, suitably and consistently arranged information resulting from

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analytical procedures over the collected data, which may have a structured or unstructured form. According to Herbert Simon, "Decision Making" is the core of every manager's work, knowing two kinds of decision-making 2.

- Programmed decision-making - these are situations the manager has already encountered. Here, it is possible to include well-known situations generally described in the Knowledgebase.

- Unscheduled decision-making - these are sessions that the manager has not met and do not know how to proceed while the input information is not consistent and in the input data, to find the necessary connections and dependencies

As we have already mentioned, we distinguish structured, partially structured and unstructured data.

Structured data is generally data that has a defined length and format (e.g., customer name, date of birth, address, etc.). Structured data is typically stored in a relational database. Sources of this data can be generated by either the machines or people.

Unstructured data is not a specified format and forms the majority of digital data. Like structured data, unstructured data is generated either by machines or by humans. At present, there are different technologies for analysing unstructured text and extracting relevant data and transforming them into structured information. These can be used for analysis (e.g. social media analysis) that can serve to understand customer behaviour. Partially structured data is a combination of structured and unstructured data. These data have a structure defined in part by individual elements and their attributes (e.g., XML files) 1.

Big Data is one of the modern concepts of the 21<sup>st</sup> century, which can be collected from distribution networks, but definitions on this issue are different. Big Data Management can be understood as "organizing, managing and managing large volumes of structured or unstructured data" for real-time decision-making. The individual attributes that characterize Big Data suggest the definition: "Big Data are large-volume, high-speed and broadly diverse information assets that require new forms of processing to enable improved decision making, broader insights into processes, and optimization." suggests that Big Data has three main components from traditional analysis data: Volume, Speed and Diversity 2.

How we mentioned the Big Data management can be understood as "the organization, administration and management of large volumes of structured and unstructured data" 2 Research by Gartner confirmed the growing interest in Big Data and the increasing percentage of their deployment in the companies. In 2012, it invested or planned to invest in Big Data technology 58% of companies 3, in 2013 64% and in 2014 even to 73% of surveyed organizations 4. On the other hand, research has shown that in 2013 had deployed Big Data projects 8% and in 2014 only 13% of surveyed organizations. Although they experienced annual growth of the deployment of 5%, it is still a small amount compared to plans 5, 6.

The above suggests that Big Data offers to organizations a non-negligible value, but are also difficult to implement, not only in terms of technology and investment, but also need to change the strategic thinking of the whole company.

## **2. Data for analysis in energetic environment**

One of the key topics surrounding the concept of "data" is the availability of massive time-based or telemetry data. With the appearance of low cost capture and storage devices, it has now become possible to get very detailed data to be used for further analysis. The very high detail resolution concerns mainly time. Nowadays, time streaming data can be recorded from almost any device, calling for interpretation to know more about the underlying system or to predict future events with higher accuracy 1. The wide range of collections can create the conditions for detailed analyzes that can result from the acquisition of knowledge through information values. The following table, Table

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