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## **DATA ANALYSIS IN SYSTEMS WITH ALTERNATIVE ENERGY SOURCES**

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The development of information, network and microprocessor technologies has formed the necessary conditions in the creation of local energy-efficient systems with electric energy generation and consumption (local energy systems, LES), where the optimal ratio between electricity supply and electricity consumption is achieved. Power supply in such systems is provided by alternative energy sources (AES), which include, in particular, solar batteries and wind power plants.

The optimal functioning of the LES is based on the maximum coincidence of the profiles of generation and consumption of electric energy in the system. The ADE generation profile is characterized by a direct dependence on the weather conditions of the location where the described energy sources are located.

Thus, the generating power of a solar battery depends on the illumination and temperature of the solar panel. These parameters, in turn, are affected by environmental factors such as cloud cover, air temperature, humidity and wind speed. In addition to the factors mentioned above, wind direction and atmospheric pressure affect the power of the wind turbine.

In order to predict the required generation profile and match it with the consumer profile, it is necessary to identify the relationship between the data obtained both from the environmental parameters monitoring unit, which is an element of the LES [1] and from the meteorological data provided by the relevant meteorological service. In the presented work the finding of such a ratio was performed using data clustering [2] and the formulation of associative rules [3].

A cluster is a group of events that are grouped with respect to the similarity of the factors they reveal. Clustering consists in dividing a given set of event samples into clusters, so that each cluster consists of events characterized by the similarity of the active factors. Events located in different clusters are significantly different from each other.

Clustering is also called as data segmentation because large groups of data are divided by their similarity. The clustering of the data which is obtained both from the monitoring unit of environmental parameters and from the weather

service is used to identify certain relationships and trends in the set of provided data (Fig. 1a).

In addition to clustering, the method of formulating associative rules is also used to find the interconnection between variables or event attributes which are described by the corresponding data massive (Fig. 1b).

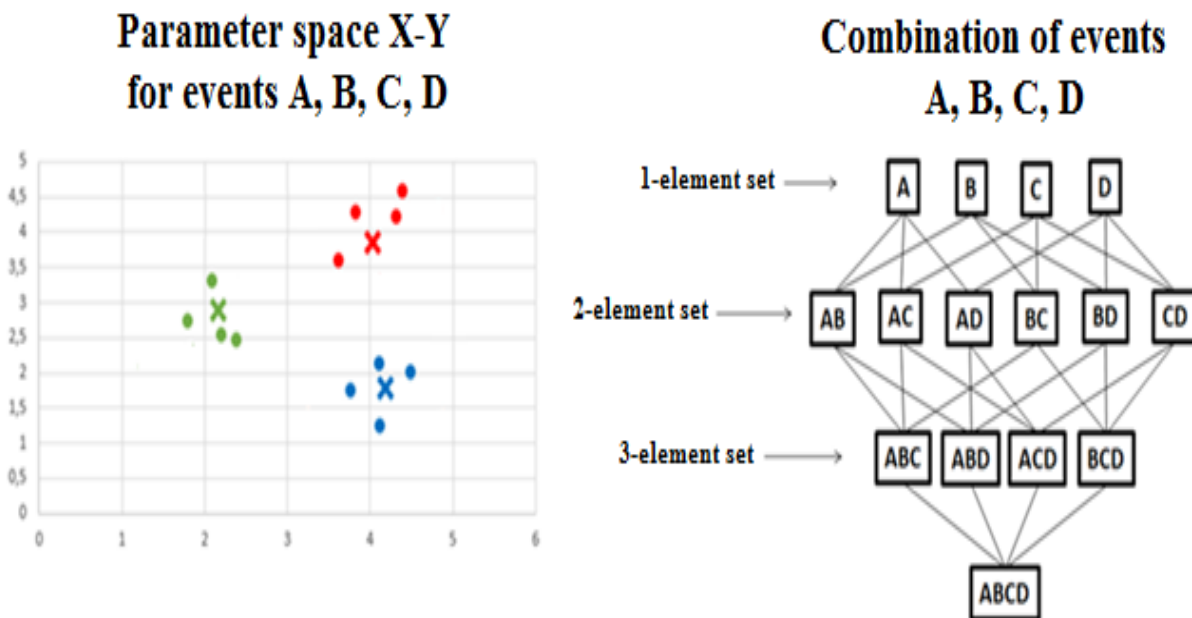


Figure 1 - Finding data correlation using a) clustering and b) formulation of associative rules

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