Description for the general public

This project continues the research project financed by the National Research Centre and entitled "The intelligent UBMSS class systems supporting the enterprise management processes". The proposed project will continue the idea of using cognitive systems within the scope of cognitive data analysis. In the new project, semantic analysis will also be executed by another class of systems. A significant innovation and extension compared to the previous project will consist in service management systems in cloud computing, which is an area completely different from hitherto solutions dedicated to single enterprises or limited data resources. The new tasks undertaken are to define the service management process in Cloud Computing (colloquially: in the cloud) and data sharing processes used to manage services. The execution of such tasks is to improve the process of splitting and distributing information between all persons (or instances) responsible for securely storing it. In addition, data splitting algorithms will be used to distribute data between individual information trustees within a specific unit or within its multiple remote and independent branches. Data and services will be managed at the level of the unit and also at the level of its multiple branches, and then this management will be delegated to cloud resources to hide the data obtained from individual units. That data sharing process in the cloud will be executed for various data splitting algorithms. Special significance will be given to cryptographic sharing algorithms with privileged shares that make it possible to account for the hierarchical decision-making structure. The decision to execute the tasks can be taken by individuals from different branches depending on the data splitting algorithms used. The essence of the proposed project is to develop new algorithms for cognitive service management and data sharing used in cloud computing management processes. The development of cognitive techniques for service and data management in the cloud is to improve management within the unit whose resources will be transferred into the cloud, and also to improve the security of strategic data that is to be classified. Research hypotheses:

1. Develop new techniques of cognitive service management in the cloud can be used to support service management processes in cloud computing.
2. Linguistic data sharing algorithms can be used to improve service management processes in the cloud.

The end result of the project will be a new class of algorithms supporting the cognitive management of services in the cloud, the secure split of the managed data, hiding information by splitting it between secret trustees, specifying privileged shares, storing data in the cloud, and a proposal of algorithms allowing hidden information to be reconstructed depending on the possessed shares in the entire split information.

The proposed solution constitutes basic research as the work on managing services in the cloud with the use of semantic analysis algorithms and data hiding schemes is currently at the stage of preliminary theoretical proposals and initial development. Such methods thus represent original scientific research. In addition, their theoretical definition and experimental verification will provide knowledge of the impact of the proposed solutions on improving service management in cloud computing and determining the significance of proposed solutions for the present and future situation.

Tackling the problem of developing new classes of cognitive systems for service management and data sharing in the cloud is justified by the need to develop effective tools for managing services and sharing data stored and managed in the cloud. As a result of executing this type of tasks it will be possible to improve the information management process with regards to the semantic analysis of the entire service management process. Currently no scientific or research centre works to develop this type of solutions that could significantly improve the management of services in the cloud. The universal nature of the algorithms developed is due to the versatility of the cognitive management systems and linguistic data sharing schemes used in the discussed solutions. So far, no work has been done that would deal with semantic algorithms of service management and data sharing in cloud computing.

Combining semantic data analysis techniques with service management processes and hiding such processes by applying cryptographic data sharing techniques is aimed at developing new, much more beneficial solutions for service management processes.