

# INCREASING POTENTIAL OF GENERAL AVIATION THROUGH SYSTEM BIG DATA PROCESSING

## Abstract

The research thesis concerns on the possibility of increasing the potential of GA (General Aviation) through the use of digital data. The dissertation presents the possible development directions of GA using technical and IT innovations. The purpose and scope of the dissertation is to present two proposals of system solutions for General Aviation based on Big Data. The concepts of database tools, elements of their structure and functionality have been described with a view to optimizing the use of General Aviation resources.

The following dissertation consists of six chapters.

The first chapter is the introduction to the dissertation, which contains key issues of introducing the topics covered in the PhD thesis and the problem under study.

The second chapter contains the characteristics of general aviation in Europe and Poland, the results of the review of available digital data resources and relates to the efficiency of obtaining information and knowledge in the aspect of their usefulness in Big Data system processing processes.

The third chapter presents the justification for the choice of the topic of the thesis, research hypotheses referring to the essence of the studied issue were formulated, based on the review of current solutions available for the general aviation (GA) sector. The possibilities of market development with the use of innovative solutions using Big Data resources were pointed out.

The fourth chapter of the dissertation is the presentation of formulated two proprietary functional and system solutions using Big Data. The ideas of the concept assume optimization of the use of general aviation sector resources. The concept of the Aviation Personnel Accessibility Platform (APAP) and the concept of the Airplane Maintenance Mobile Workshop e-AM2W were presented. UML was used to illustrate the main components of database systems. This chapter presents descriptions of conceptual models and presents UML diagrams.

The fifth chapter is devoted to issues related to the implementation of the presented solutions on the general aviation market. Benefits resulting from the introduction and use of APAP and e-AM2W database concepts and tools as well as significant improvement in the availability of GA services by using the presented solutions have been indicated. Restrictions on the implementation and use of digital systems and platforms have also been listed, resulting from the low level of digitalization process and the high heterogeneity of data (information) regarding the GA market, as well as the limited confidence and skeptical approach of market players in Poland to sharing data resources for fear of their security.

The sixth chapter of the dissertation is the summary of the PhD thesis. The final remarks and conclusions were include. It concerns further recommendations for similar initiatives and suggestions of research areas for future.

In all parts of the dissertation, as part of the presentation of data collection and processing processes and their subsequent use was structured and clarify specific concepts related to the general aviation market but also the digitization of data and innovative technologies.