Lagos State Ministry of Science and Technology in Nigeria: Top-down Development Planning.

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Customer.

The Lagos State Ministry of Science and Technology is responsible for planning, development and implementation of Lagos State (Nigeria) policy in the field of new technologies. It aims to exploit innovation in a way which will contribute to solving problems and have a positive impact on society.

Lagos is the smallest and at the same time the most densely populated state in Nigeria. The Lagos agglomeration has an estimated number of inhabitants reaching about 21 million, which makes Lagos one of the 10 mostly populated cities in the world. The state's dynamic development and constant influx of new residents have led the Ministry to seek a solution which would improve the efficiency of the state's development planning, enable efficient management of spatial resources and ensure better management of the 3,577 km² area.

This meant that modern tools were needed to capture images feeding the Geospatial Information System with reliable, up-to-date and high-quality data.

This is why the Lagos State Ministry of Science and Technology decided to use Unmanned Aerial Vehicles (UAVs). It chose Asseco Nigeria to implement the project. The company won the international competition thanks to innovative solutions developed by Asseco Poland, which was responsible for the delivery of two unmanned platforms together with operator panels, Asseco Ground Control Station (Asseco GCS) and Asseco Simulation Environment (Asseco SE), enabling training for unmanned aerial systems' operators. The implementation was carried out by Asseco Nigeria in close cooperation with Asseco Poland.

Implementation.

The project began in February 2017 and was implemented in two stages. During the first one, Asseco supplied the Asseco SE simulation environment, which provides training for unmanned aerial systems' operators. Thanks to the solution, the operators can acquire necessary skills related to the complex use of the UAV system – from planning, take-off, execution of the entire mission to landing – and acquire knowledge needed for a quick and appropriate response to emergencies. The software allows flight training to be conducted in a way that very accurately reflects the actual conditions of the use of Unmanned Aerial Vehicles, without fear of losing the platform or waiting for the appropriate weather conditions.

As part of the project in Nigeria, Asseco also established a certified training centre for UAV operators and a service centre. It was the first investment of this type in the region and one of the first in Africa, thanks to which several dozen people per year will be able to gain theoretical and practical knowledge. The scope of training includes the maintenance and use of multirotor and airframe platforms, as well as software for building a digital terrain model. The training courses are conducted by experts from Asseco Poland and Asseco Nigeria.

In the second stage of the project, the company was responsible for delivering UAVs, which, thanks to Asseco's software, enable the creation of an accurate orthophoto basemap of the entire Lagos State.

The use of Asseco GCS makes it possible to plan the flight routes with the highest precision. Flights can be performed simultaneously by two unmanned platforms, each moving over one of 39 separate sectors. For 6 hours spent in the air, a drone takes about 22,000 pictures in very high resolution. A flight over one area of 12 km² is carried out within two days.

Asseco Ground Control Station enables the operators to continuously supervise the progress of their missions. The photos taken during each flight by the flying platforms are then analyzed and processed with the use of dedicated software, which creates orthomosaics. In this way, a very precise orthophoto basemap of the area is created, which is made available in the geoportal in the next stage.

As part of the project, Asseco was also responsible for integrating individual components of the solution and testing the system, which was fully adapted to the requirements and needs of the Lagos State Ministry of Science and Technology. Owing to Asseco GCS's flexibility, it will be able to be extended and ultimately integrated with the Unmanned Traffic Management (UTM) system.

The implementation of the software was the responsibility of Asseco Nigeria, which was also the first line of customer support. The project was carried out in full cooperation with the Nigerian Civil Aviation Authority and the Office of the National Security Adviser to ensure compliance with all applicable regulations and security procedures.

The African market's dynamic development has made unmanned systems more widely used in the implementation of activities related to security or business. The Lagos State Government has decided for the first time to use unmanned systems in its eGIS project. It is very important for us that it decided to cooperate with our company, as the development of these systems is an important element of Asseco's strategy. We beat the competition from all over the world thanks to the advanced functionalities of Asseco GCS, which ensure maximum safety during flights over densely populated areas. The support of Asseco Nigeria, which was responsible for the maintenance work, was also very important. This project once again showed us the enormous potential we have when acting together as the Asseco Group – said Zdzisław Wiater, Director of the International Organizations and Solutions for the Security Sector Division of Asseco Poland.

Key benefits.

As a result of the project, Lagos State has a solution which provides highly accurate measurements and efficient image acquisition feeding the State's GIS system. It has also gained the ability to register real estate and receive up-to-date administrative information about over 21 million inhabitants and their places of residence, work and leisure.

Asseco's cooperation with the Lagos State Ministry of Science and Technology allowed, among others, for more effective planning of the development of this region of Africa and management of its spatial resources. It also enabled continuous monitoring of environmental pollution as well as land erosion and flooding risks.

Asseco's solution has become an integral part of the Lagos eGIS project, enabling the efficient acquisition of high-resolution images of a vast agglomeration area. It has also ensured their processing and publication through the geoportal to both residents and investors.

Thanks to the educational center established by Asseco, Lagos State can effectively educate other UAV operators who, thanks to training in environment accurately reflecting drone behavior in the air, can prepare well for future flights.

It was a pioneering project, and, at the same time, the largest GIS project ever carried out in West Africa. The UAVs delivered by Asseco are the most reliable, safest and cheapest way to collect and continuously keep updating accurate cadastral data, which is vital for an economy like that of Lagos State – said Simon Melchior, CEO, Asseco Nigeria.

Apart from the strategic cooperation between the Lagos State Ministry of Science and Technology and Asseco Nigeria, this project is a practical example of the transfer of technology and knowledge from Europe to Nigeria and we trust that this project will turn Lagos into a UAV center of excellence – said Hakeem Fahm, Lagos State Commissioner of Science and Technology.

The integration of this complex system was a real challenge for the whole team. Such difficult and advanced solutions are rare on a global scale. A successful implementation, the main part of which is AGCS software, which manages the whole photogrammetric mission together with the installed sensors – LIDAR, thermal imaging camera and high-resolution cameras – proves the high maturity of our system and the high competence of our team. It also allows for optimistic approach to next international challenges – said Tomasz Mosiej, Project Manager in the Division of International Organizations and Solutions for the Security Sector at Asseco Poland.

Project in numbers:

2

Unmanned Aerial Vehicles with advanced payload (LIDAR, thermal imaging camera and high-resolution cameras)

3,577 km²

area covered by a single orthophoto basemap

12 h

hour flight over each of the 39 sectors

21 mln

inhabitants will get access to up-to-date data

22,000

photos in a single flight

39

sectors covered by flights, each covering the area of 12 km²

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