

ArtiQ: AI is making a difference in lung disease assessment

ArtiQ, is a young and innovative spin-off company of the University of Leuven and the University Hospital of Leuven (Belgium). Intensive collaboration between medical staff, engineers, and technical staff resulted in an algorithm for a better interpretation of lung function tests. Besides, the young company invests also in research on AI to support first-line care in the field of lung diseases and the clinical trial business. How does COVID-19 impact their business?

Marko Topalovic, CEO and co-founder of ArtiQ explains: ArtiQ is a result of research conducted in very close cooperation with the medical practice. The mission of ArtiQ is to empower medical practitioners with artificial intelligence to accurately and timely diagnose, treat and monitor patients with respiratory diseases.

The company launched a software package based on AI supporting the interpretation of lung function tests. Lung function tests are used as a golden standard screening test to evaluate the lung function for a broad spectrum of diseases. The interpretation of a lung function test consists of two main elements. On the one hand, describing the lung function according to international guidelines. On the other hand, making a link to a potential diagnosis to determine the next steps in the diagnostic process. In some cases, the link to the disease is not straightforward. A study reveals that mainly in the case of complex or rare diseases, pulmonologists may come to very different answers. The software can offer a second opinion and serve as a decision support tool. An international multicenter study performed in 16 hospitals in 5 countries – Belgium, the Netherlands, France, Luxemburg, and Germany – and with the collaboration of 120 lung specialists proved that out of 8 diseases the software narrows down the most probable disease with an accuracy of 82%. The results were published in the European Respiratory Journal. The software, ArtiQ.PFT, is already used in the interpretation of more than 50.000 lung function tests in UZ Leuven, CHU Saint-Pierre, OLV Aalst and ZOL Genk.

Due to the COVID-19 pandemic, all lung function tests were shut down during a certain time. Now hospitals are restarting their practice and lung function tests can be used to monitor the progression of the disease. In line with the philosophy of our company to help medical professionals, we offered our software free of any licensing fees until September to support the post-crisis period. This was triggered by the request of a French doctor, who asked for help to follow-up patients, so we decided to support all of them. The initial idea was to make doctors more available for their patients and to avoid

unnecessary administrative work with reporting. We are convinced that this will lead to a better follow-up of patients in the future.

From hospital to first-line care

One of the newest research projects focusses on first-line care. Our first goal was to support the interpretation of lung function tests for in-hospital care. However, nowadays two-thirds of the patients are visiting their general practitioner. Our goal is to bring the AI-expertise from the 3rd and 2nd line to the primary care. Apart from hospitals, spirometry is also used on the GP-level to detect lung diseases and to follow-up on lung function. ArtiQ plans to integrate AI-expertise with spirometry to support GPs in identifying lung diseases and improving their decision making. In the future, such tool may play an important role in the follow-up of COVID-19 patients on the GP level.

Improving study data

In respiratory drug development, lung function is the primary clinical tool to assess the efficiency of treatment. Therefore, it is critical for pharmaceutical companies and the success of their clinical trials that the results of these tests are consistent and reliable. ArtiQ developed an artificial intelligence-based software, ArtiQ.QC, that immediately evaluates the quality of the data of such test in line with the international standards. Today, this quality control process is largely manual, making it costly and with a large turnaround time. Immediate quality feedback is essential to avoid bad quality data to enter the study, to reduce patient revisits for repeated measurements and to ensure decisions are made based on correct data in patient selection and randomization. With this new tool ArtiQ aims to support the pharmaceutical industry and clinical trial practice to improve their studies.





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Point of View



Article written by: Prof.dr. Marco TOPALOVIC



Prof. dr. Marco Topalovic

Marko Topalović, PhD is a CEO of ArtiQ (Leuven, Belgium), a company that aims to empower medical professionals with artificial intelligence to accurately and timely diagnose, treat and monitor patients with lung diseases. Formerly, Marko worked on inventing algorithms for assessing lung disease as postdoctoral researcher in the UZ Leuven. He obtained a PhD degree on the topic “Artificial intelligence for pulmonary function tests” at the KU Leuven. His scientific work has contributed to many peer-reviewed publications and conference presentations. Moreover, he received several international awards. Marko earned his business education from the Flanders Business School.

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The European Respiratory Cluster Antwerp (eu.reca) is a dynamic knowledge platform with a focus on the lung. In order to improve therapies and quality of life of patients, develop new products, reduce societal costs and deal with the challenge of air pollution, we believe it is necessary to connect and unite all stakeholders in an expert community.

“As a catalyst for innovation, we want to bring promising start-ups into contact with leading companies, pharma with product designers, academics with entrepreneurs, and investors with patients. That is why our approach is based on interaction. Our extensive network ensures a quality pool of participants. Our workshops and symposia encourage in-depth dialogue.”
Frank Pieters, Founder and Chairman of the Board.

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