

LAIFE REPLY, a Reply Group company specialising in the implementation of Artificial Intelligence, Machine Learning and Big Data solutions for public and private healthcare companies, pharmaceutical and lifescience industries. The aim is to strengthen medical diagnosis processes, decision support in clinical areas and improve patients' lifestyles.

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ALL FASTER BETTER TOGETHER

# ALFABET

The COVID-19 emergency highlighted the need to enhance surveillance activities and care of patients at home in order to avoid hospital overcrowding. ALFABETO responds to the need to make a diagnosis of the patient, based on the analysis of all available clinical data.

# WHAT IS ALPHABET

The COVID-19 emergency currently underway around the world has highlighted the need to accelerate change in care and patient care strategies with a twofold objective: reducing hospitalisation while ensuring a better and more accurate service for citizens. State-of-the-art technology makes a significant contribution to facilitating and easing the entire care setting.

The ALFABETO solution is placed in this context, with the main objective of assisting healthcare personnel in the initial triage phase at the patient's home through an objective assessment of the degree of severity of the pathology and a predictive analysis of the possible evolution in the short to medium term. ALFABETO supports the doctor in defining the care strategy to be adopted, based on evidence extracted from data by means of machine learning algorithms.

## THE PLATFORM

ALFABETO is developed on a software platform, integrated with the diagnostic instrumentation, based on Artificial Intelligence components and aimed at supporting diagnosis, sharing clinical information in real-time with the various health professionals involved in the process and predicting the evolution of the pathology.

The possibility of sharing information in real-time between different professionals

The platform developed with ALFABETO represents a highly innovative solution, with the support of Machine Learning predictive models, which are fundamental tools for operators in defining the diagnosis and treatment: home care or admission to hospital, with the possible generation of a 'pandemic waiting list'. The platform developed with ALFABETO represents a highly innovative solution.

## PRODUCT INNOVATION

It unifies in a single platform:



AI techniques, specifically neural networks, for analysing clinical images

Radiomics models for enriching the clinical picture of the subject for a better understanding of the state of health

Real-time integration of heterogeneous clinical data sources for an overall picture of the subject's clinical situation

Collaboration tools for communication between health professionals

## PROCESS INNOVATION

It introduces innovations in the process of home diagnosis and triage for Coronavirus outbreaks:



Carries out a full Triage at the patient's home, avoiding travel

Relates real-time Professionals who are not physically present

It allows a unified view of processes normally carried out at different times - GP, home visit, diagnostic tests, access to A&E.

## SERVICE INNOVATION

Able to guarantee:



Diagnostic services at the patient's home Support for real-time reporting, depending on the level of priority defined by the algorithm, directly to the operating unit territorial

Optimisation of A&E accesses and their appropriateness

# HOW IT WORKS

The ALFABETO project is based on a platform of innovative tools and services providing a comprehensive view of the patient, as well as a rapid and objective response for his treatment and interaction with health professionals.

It integrates **all data sources that provide** a complete picture of the subject's clinical situation: anamnestic data, collected through specific application functions, can be integrated with access to data from the regional FSE, with data from the General Practitioner's (GP) medical record and with physiological parameters measured by medical devices (e.g. saturimeter, pulse oximeter, etc.);

It **integrates the performance of chest X-ray examinations at the patient's home**: the image produced is immediately shared through the software platform with the radiologists of the reference hospital; the intelligence software is able to provide the patient with the necessary information.

Artificial analyzes the DICOM image (standard format of radiological images), identifies the level of severity of the lesion to prioritize the assessment by the radiologist and shares the report with the home health team and the GP;

It **supports the healthcare team by suggesting a 'dynamic triage'** whose contents vary in relation to the data collected - dynamic decision tree;

It **uses ML models to develop a predictive analysis of disease evolution** to support the operational choice - hospitalisation vs home care;

It **generates a clinical database that can be supplemented with additional data** from subsequent follow-up and/or instrumental examination results;

It **can interface with the Subjects' monitoring APPs** to capture and share contextual data to support predictive analysis models.

## BENEFITS

1

Hospital access only for necessary cases

2

Possibility of enhancing home management of patients

3

Optimising hospital resources in a pandemic setting

4

Diagnosis time, from anamnesis to the report of diagnostic examinations, carried

5

Accuracy and speed of decision-making in inpatient vs. home care diagnostic assessment

6

Reduction of radiological examination reporting

## PARTNERS

The ALFABETO project was born from the union of three partners whose specialisations and expertise enables a high degree of synergy that can provide a concrete and rapid solution. The project involves highly specialised research institutes and industrialists in the fields of medicine and AI.

**University of Pavia** - Department of Clinical, Surgical, Diagnostic and Paediatric Sciences and Department of Internal Medicine and Medical Therapy for the high level of multidisciplinary expertise in the field of medicine.

diagnosis and treatment of COVID-19 and for the availability of a high casuistry

specific to their clinical activity.

**ICS Maugeri IRCCS** for the continued admission of COVID-19 patients coming from San Matteo and other facilities and for the experience gained on AI systems in Imaging Diagnostics.

**Laife Reply** specialises in the prototyping and development of software solutions based on AI and ML algorithms in the specific field of clinical healthcare and for its undisputed experience and expertise in the management of clinical data and documents.

