THE PARTNERSHIP

BD2Decide is conducted by an international partnership that includes 4 research institutions, 5 cancer clinics and 3 ICT companies.

Italy

Azienda Ospedaliero Universitaria di Parma
MultiMed Engineers srls
Fondazione IRCCS Istituto Nazionale dei Tumori
Politecnico di Milano
Università degli Studi di Parma

Germany

Heinrich-Heine-Universität Düsseldorf Fraunhofer IGD Visual Computing

Greece

Athens Technology Center S.A.

Israel

All in Image Ltd

Netherlands

Stichting VU University Medical Center
MAASTRO

Spain

Universidad Politecnica de Madrid

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WHAT IS BD2DECIDE?

BD2Decide builds on the joint deployment of (i) data management techniques for "big data" and (ii) an integrated library of analytical models validated by the scientific community, to improve the prognosis and treatment of head and neck cancer.

Cancers of the head and neck region are the 6th more deadly cancers worldwide (in Europe around 150.000 new cases are detected each year) and their treatment can have hard impact on patient's aesthetics and essential functionalities, contributing to a substantial decrease in quality of life.

The intrinsic heterogeneity of such tumours makes their understanding particularly difficult and in most cases the diagnosis is made at later stages, when therapeutic impact is heavier and results are less certain.

The increased availability of new data –both in quality and quantity– is challenging the world of ICT technologies to obtain much more precise prognostic predictions, to implement first-line treatments which maximize therapeutic results and minimize the impacts on the patients' quality of life.

BD2Decide is a cloud based, distributed infrastructure, that will be available to healthcare centres across Europe.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 689715

BD2DECIDE

BIG DATA AND MODELS FOR PERSONALIZED HEAD AND NECK CANCER DECISION SUPPORT

BIG DATA TECHNIQUES

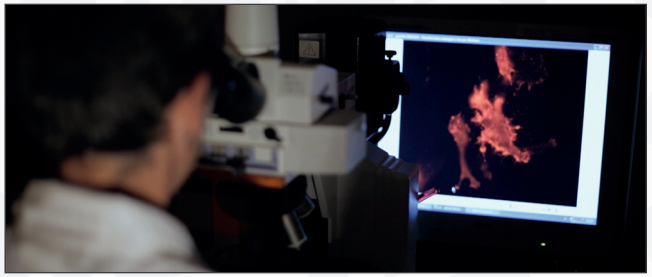
BD2Decide deploys Big Data techniques to discover and validate personalized prognostic patterns that outperform current practice. This objective is being achieved through:

- The setup of an appropriate cloud computing infrastructure to collect and homogenize data, in compliance to state-of-art standards.
- The application of data analytics to categorize each individual patient and each cancer sub-type, to find person-specific patterns and to apply the most suited prognostic models.

IMAGING AND RADIOMICS

BD2Decide refines and validates advanced imaging and radiomics tools, for the discovery of new prognostic signatures. In particular:

- It implements a functional imaging analysis and features extraction tool, that derives new information from images and calculate tumour and lymph-nodes volumes from CT/MRI.
- It implements a radiomics software applied to CT, MRI and DWI MRIs to capture phenotypic heterogeneity in tumours.



VALIDATION

Clinical validation of the system is conducted in different EU populations, based on around 1000 retrospective cases and 450 prospective cases, collected in the 5 participating clinical centres.

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Twitter: **twitter.com/bd2decide**
Facebook: **facebook.com/bd2decide**

PROGNOSTIC MODELS

BD2Decide enriches and refines existing prognostic models, to obtain an improved and more personalised prediction, through:

- The combination of different models into a single pooled estimate (synthesis analysis)
- The updating of existing models using newly available data sets and adaptive Bayesian machine learning techniques
- The scoring of prognostic factors, to provide physicians with additional insight into the added value brought to the prognosis by each factor.

VISUALIZATION SUITE

BD2Decide develops a highly interactive visualization and presentation suite for tumour understanding and treatment, based on:

- Digital Patient exploration tools, for easier access to data by clinicians.
- A co-decision environment, to actively engage patients in the therapeutic process, in line with the “no decision about me without me” initiative.
- The development of an assistive data visualization and presentation suite aimed at supporting medical researchers.