



AEGLE

An Analytics Framework
for Integrated and
Personalized Healthcare
Services in Europe

AEGLE'S Brief n°2

First components for local, cloud-level Big Data analytics and Applications

By Certh, Croydon, Exus, Gnubila, ICCS, Kingston, Maxeler, Pagni, Uppsala University, Universita San Raffaele.

At the centre of health debates there are open questions on how to manipulate data and how to produce value out of it, share it and secure it. Although ICT technology makes advancements to give solutions in big data volume and velocity issues, the healthcare industry has been hesitant in embracing Big Data.

AEGLE aims to generate value from healthcare data with the vision to improve translational medicine and facilitate personalized and integrated care services overall improving healthcare at all levels, to promote data-driven research across Europe and to serve as an enabler technology platform.

The applicability of Big Data techniques on biological and health-related data, naturally quite complicated and difficult to collect, is still limited. Modelling biological phenomena is typically very complex and has always been understood to be a computationally intensive process. In order to draw meaning from the exponentially increasing quantity of healthcare data, a shift towards a big data perspective is proposed, utilizing technologies capable of processing massive amounts of data efficiently and securely. Collecting and aggregating anonymous data from geographically dispersed locations makes it possible to construct statistically meaningful databases, based on which macroscopic reasoning can be made, rather than solely focusing on the individual and associated pathology. Data driven generation of new medical knowledge premises the support of personalized medicine, thus effective treatments for each individual instead of the average patient, forms one of the missions of big data in health. Several European initiatives have already pinpointed the importance and usefulness of healthcare big data, e.g. to predict

the outbreak of an epidemic etc.

The scope of AEGLE project is to develop and provide a Big Data analytics infrastructure that will deliver integrated ICT services for healthcare to enable and promote research and innovation activities, as well as serving as a strategic pillar for business development in the field for big data analytics for healthcare. AEGLE solution targets to address the whole data value chain for health based on: cloud computing and Big Data technologies for scalable ICT services, HPC infrastructures for computational acceleration and advanced visualization techniques and contribute in the area of analytics for Health Bio-data.

AEGLE's objective is the development of a scalable software infrastructure by both adapting available components and developing the ones that are currently on design phase. More specifically, AEGLE's technical workpackages promises to:

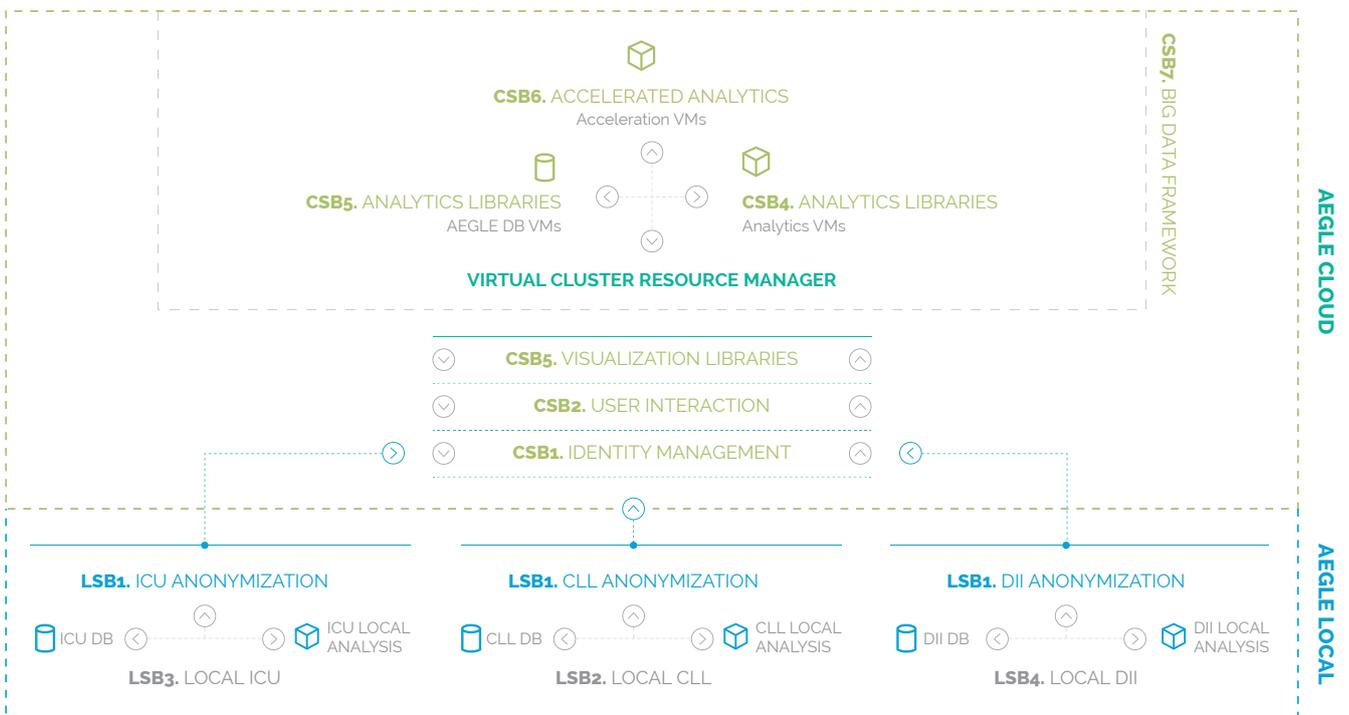
- Develop, adapt and tune the BigData algorithms for analysis of CLL's BioData, ICU's Bio-signals and Diabetes II multi-parametric streams.

- Develop accelerated analytics and optimized queries.
- Adapt data aggregation and anonymization services of (bio)medical databases.
- Provide advanced visualization solutions for healthcare services.
- Develop and deploy the cloud service of AEGLE's scalable analytics platform.

AEGLE starts from real life conditions in the three medical cases, which include clinical and biomedical research. It is thus important to recognize not only the data that are produced at each organization, but also the procedures and analysis pipelines that

are in place. Therefore AEGLE infrastructure defines the local and the cloud domain, as well as a loose coupling between them. The local domain refers to the organizational private space, where routine use of data takes place, as well as analysis without privacy concerns. In the cloud domain, data from multiple organizations are uploaded to common storage and analysis infrastructure that can be shared, combined and analyzed, provided the necessary access and privacy-related pre-processing. The cloud domain will provide more sophisticated data management, applying robust and scalable data management techniques that are potentially lacking at the local domain, due to organizational issues among others.

AEGLE architecture and subsystems annotation



Partners of the Aegle's Consortium



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 644906



The Aegle Project

Aegle's mission is to realize an European business ecosystem to healthcare stakeholders, industry and researchers for creating out-of-box knowledge in order to provide cloud and HPC data services and support new products that will improve health.