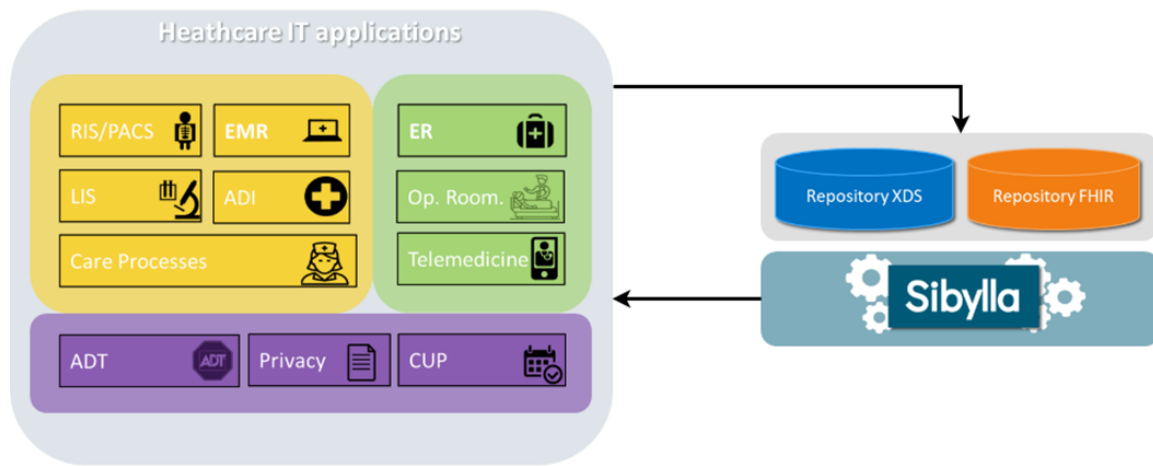




Sibylla

CDSS for personalized medicine

Sibylla is a clinical decision support system (CDSS) based on active observation models created to satisfy the growing need in the healthcare sector for a system capable of supporting healthcare professionals in the use of clinical pathways (Diagnostic-Therapeutic Assistance Paths - PDTA) and promoting personalized medicine not tied to a rigid static workflow but which applies the protocols to the individual case in a timely and dynamic manner. It reduces waste of resources and at the same time guarantees adequate and tracked care for all patients, following protocols, guidelines and standard paths introduced in clinical and healthcare practice.



The advantages offered by the introduction of Sibylla can be summarized in four main areas:

- **Cost reduction:** fewer days of hospitalization for adverse drug reactions or medical complications, fewer diagnostic tests performed for defensive purposes and reduction in legal costs;
- **Increased safety:** greater awareness of clinical risks and their better management;
- **Increased effectiveness:** improvement of outcomes and average reduction in hospitalization and mortality;
- **Better clinical appropriateness:** introduction of Evidence Based Medicine, carried out following the guidelines and indications contained in medical evidence.

Characteristics

The system is capable of:

- reacting in a timely manner following a real-time logic;
- managing any type of pathway including diagnostic protocols both acute or long-term such as PDTA;
- integrating with an unlimited number of information sources by acting as an aggregator for processing and/or evaluation purposes;
- speaking natively according to all international standards including XDS, HL7 and FHIR;
- fitting into pre-existing systems;
- powering workflows and escalation mechanisms;
- enabling healthcare management to define models;
- integrating with complementary and contextual information sources;
- supporting personalized medicine.

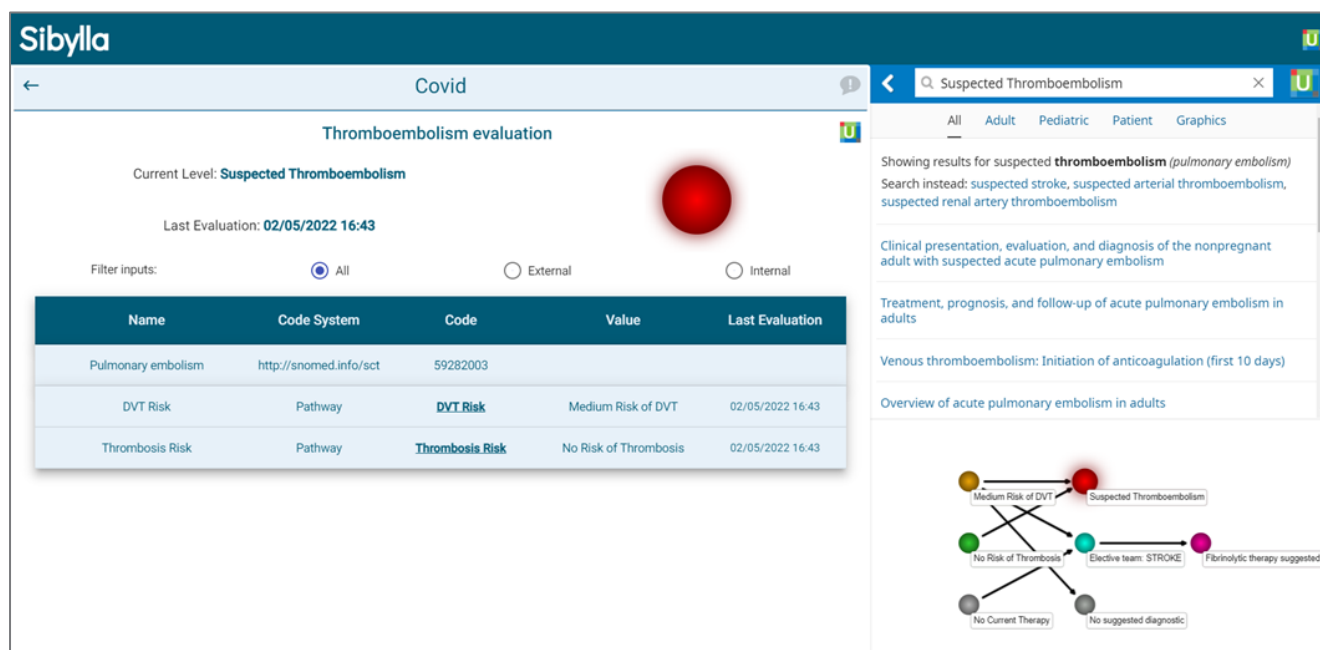
Sibylla Modeler, the tool for defining observation models or pathways, allows you to independently create or modify pathways thanks to a web interface. The structure of pathways resembles that of a neural network and can rely on different approaches: both "predictable" and algorithmic, and based on expert networks trained with an approach oriented towards explainable AI.



Patient enlistment in one or more pathways can occur according to different scenarios:

- **Manual enlistment:** through specific web form that can be integrated into a pre-existing application (e.g. medical record) or standalone;
- **Automatic enlistment through structured data:** enlistment following an automatic evaluation based on the presence of certain clinical information on the patient, extractable from the Clinical Repository or other data source;
- **Automatic enlistment through expert system:** extraction from existing documents, with NLP technique or through trained network processing, of information relevant for the recognition of chronic patients.

The system, starting from the available data and comparing them with the defined model, composes a unique condition for each patient, to whom at least one pathway is assigned. The resulting framework does not have the sole purpose of outlining the patient's immediate state of health, but allows the management of reactions that can lead to informative content, prescriptions or other applicative and clinical actions.



There is a great variety of actors who benefit from the deductions of observational models: it could be an operator who uses the cross-domain clinical viewer (**xViewer**); Emergency Room (**eEmergency**) or Medical Record (**ClinicalCare**) systems capable of receiving suggestions or alerts returned by **Sibylla**; or operators alerted directly by everyday tools such as e-mail, text messages, WhatsApp, Telegram, etc.

Sibylla is a web component, which can be activated from a widget, resides within a clinical application and displays in graphic form the patient's current clinical picture with particular attention to the conditions (pathways) deemed relevant for timely treatment, including the history and information detail that causes a certain state.

A fundamental note to outline the functioning of the platform is the use of notification logic. In fact, to support a real-time approach, Sibylla uses Publish/Subscribe systems to keep data updated, while at the same time limiting excessive burden on the system and thus allowing timely reactions. The data, updated in real-time, are evaluated by "processors" which cause the re-evaluation of the patient's status according to mechanisms that can be defined directly by the clinician during the pathway design phase.

The processors are the element that allows the Sibylla platform to operate in a specific and different way in each context, adapting to specific needs.