CALM: Context Aware Learning Machines

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Context

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- SARS-Cov-2 pandemic has posed both social and economic challenges to governments and, specially, health systems.
  - Mitigation of pandemic impact required an enormous effort
  - To this end, data science and data-driven models have been a key element
    - Making predictions,
    - Measure the impact
    - Interpreting evolution.

Context

- Technological challenges to be faced affects the whole development cycle
  - Need of reliable and accessible data sources
  - Integration of data from different sources
    - Different formats
    - Not uniformly codified
    - Not acquired for modelling purposes.
  - Build effective predictive models
    - Variable nature of input distributions throughout pandemia evolution
      - Different waves
      - Effect of governmental measures
      - Mutations leading to changes in symptoms, their severity
      - Vaccinations campaigns
    - Tools for deal with Concept-Drift are needed.

Context: What we propose

- Automatic process for the entire ML model-building process
  - Data ingestion
  - Data preprocessing and curation
  - Model building and evaluation
  - Model deveployment and maintenance

- To make these systems to be sustainable in time
  - Detect/adapt, characterise and react to changes that lead to loss of performance.

- **Objective:** provide reliable information and knowledge to support decision making in a fast-changing conditions

CALM Project: Main Objective

- **Main Objective**

> Develop techniques that allows the **detection** and **characterization** of concept drift

- Focus on health scenarios that can degenerate into pandemic situations
  - Highly imbalance data
  - Deal different type of data
    - Tabular and static
    - Sequential: irregularly sampled

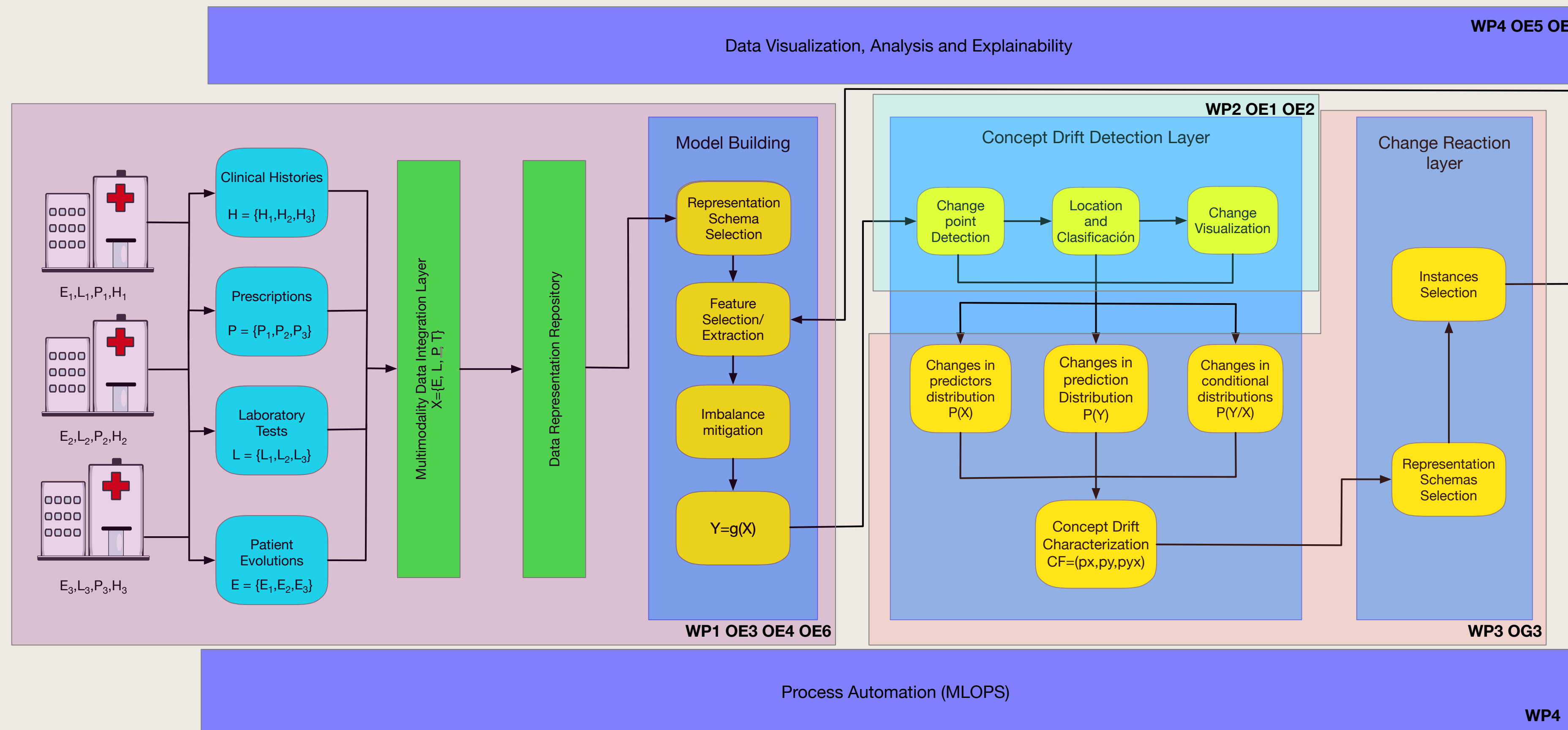- But open to collaborate in other domains.

Context: What we propose

Thank you for your attention

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