Clinical Decision Support Systems Pilot Demo

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Information Society

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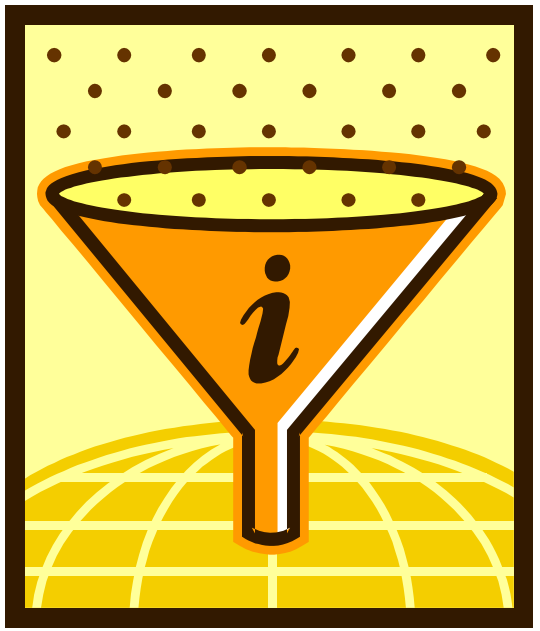
What is a CDSS?

- Application that Extracts Medically Relevant Knowledge from a Large Set of Information with the Objective of Guiding the Practitioners in their Clinical Practice.
- It Consists on Several Trained Classification Engines that Process a Formatted Input Determining its Category from a Predefined Set.
- Currently 7 Classification Engines and Two (Three) Application Areas Talassemia and Soft Tissue Tumours (and Schizophrenia).



User Community

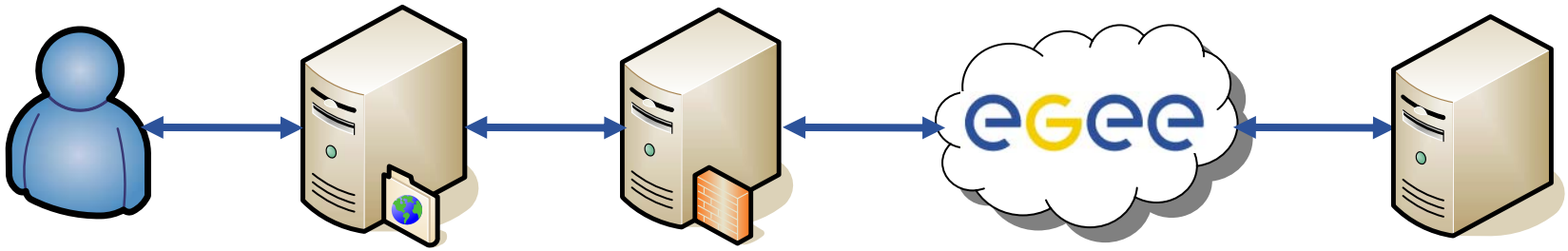
- **Usage of the Tool**
  - For an Individual Case when More Information is Needed, Under the Supervision of the User.
  - For the Automatic Classification of a Large Set of Cases (Epidemiology Studies), Assuming the Classification Error.
- **Medical Users: Depending on the Area**
  - Anaemia
    - Haematological Department of Hospital Dr. Peset.
  - Soft Tissue Tumours Classification
    - eTumour Consortium (http://www.etumour.net/)
    - ADIRM (Asociación Española para el Desarrollo y la Investigación en Resonancia Magnética)

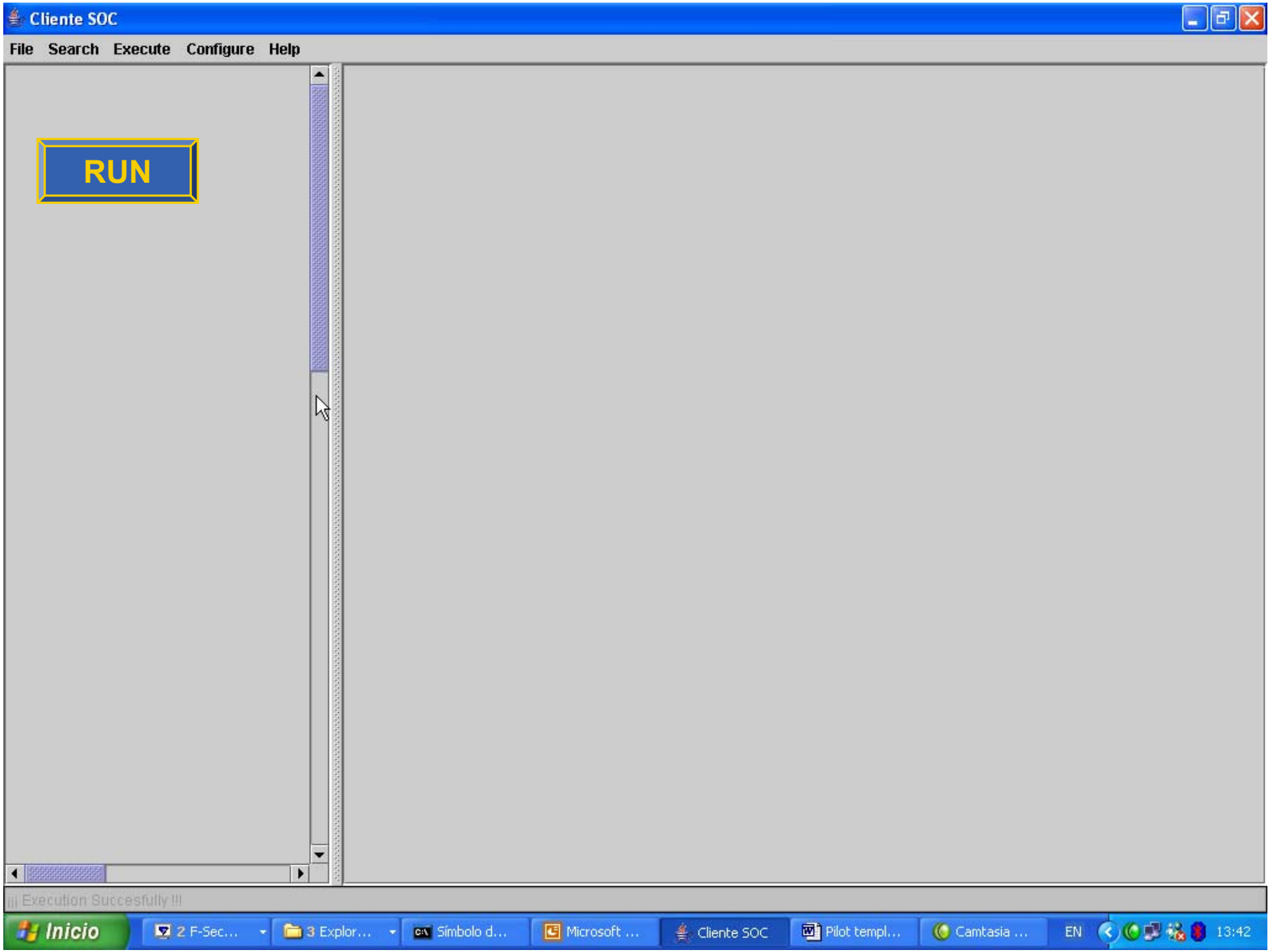
Objectives of the Grid Approach

- **Problems and Needs**
  - Remote Usage. Sending the Classification Sw Will Compromise IPR.
  - Security and Accounting.
  - Batch Usage in Epidemiology Studies.
  - Publication of Resources and Features to Select the Most Suitable One.
- **Advantages of Grid**
  - More Natural Concept for Services.
  - Security and Accounting by Definition.
  - Access to Higher Resources in Batch Usage: Advantages on the Combination of Results from Different Sources.
  - Robust and Dynamic Publication of Available Resources.

Grid Architecture

- **Components**
  - Access from the Web: Need for a Gateway to the Grid.
  - Set of Trained Classifiers (Engines) Located in Different Processing Nodes.
    - Each Engine has a Descriptive Report of all its Features and Relevant Information (XML Document).
  - A Searching System Enabling to Locate the CEs Containing Engines According to a Criteria (Corpus, Efficacy, etc…)
  - Execution of Engines with a User-Specific Input.
    - Execution of the Classifier Engine in the GRID.

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Further Work

- **Integration of the SW Library on the Tool used in eTumour Consortium.**
  - Enabling Batch Processing.
  - Enabling Multi-Classifier Classification.
- **Integrate the Training Part on the SW Library.**
- **Ease the Installation of the Tool.**
- **Extend the System to Other Cases.**
  - The Public Health Unit of the Valencia Region is Interested.
    - Clinical Records are of the order of 3 Million per Day.
    - Depending on the Disease to Test (Initially Arthritis), Relevant Records are of Several Thousands per day.
  - Relation of Schizophrenia and Genomic Factors.

Conclusions

- The System is Installed and Running on LCG2.
- The Development of New Classification Components in a Configured Site is Easy.
- The Process of Integrating New Sites will be Improved.
- Individual Jobs are Short, but Classification of Large Number of Jobs is Relevant in Epidemiology Studies.
- Medical Interest is on-Line with the Priorities of Research in eHealth of the EU.