



## EAST/DEBAT WORKSHOP

# DEBAT product features and perspectives

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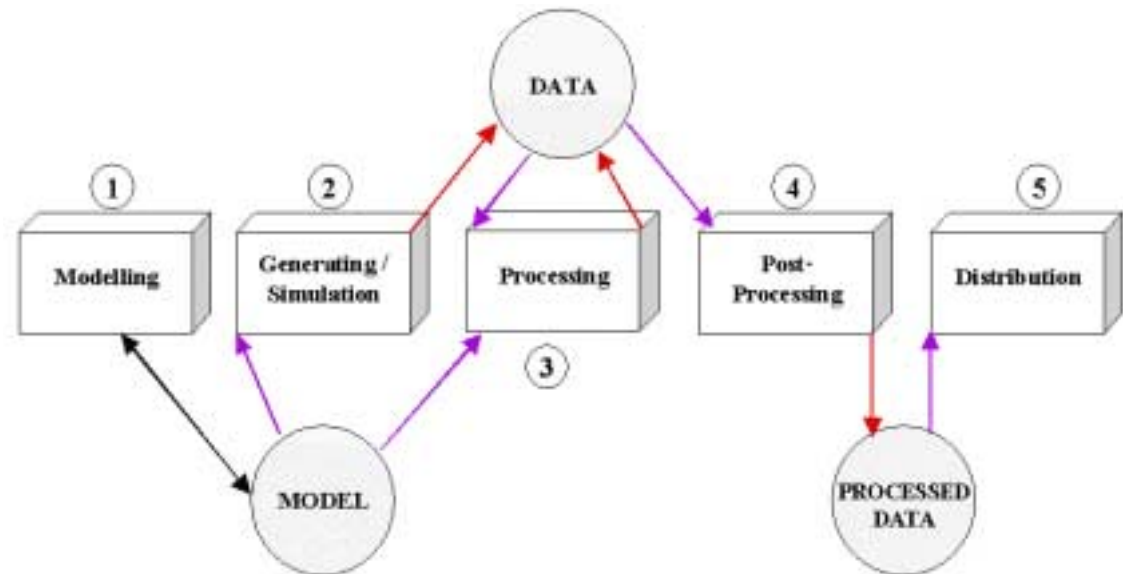


## I - DEBAT features

# I - DEBAT features - Scope

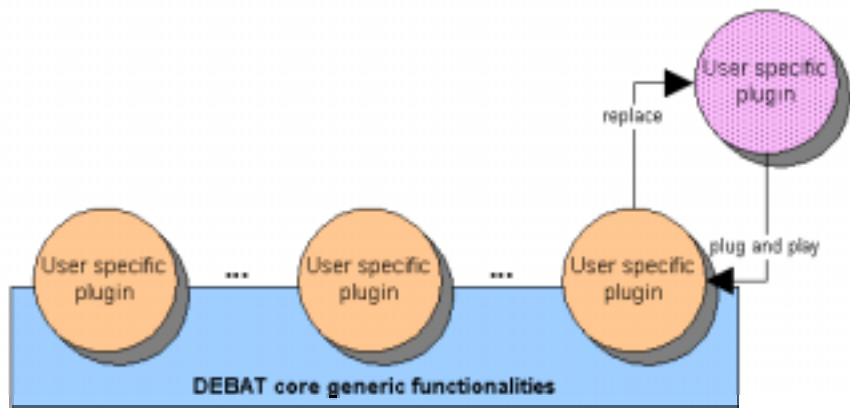
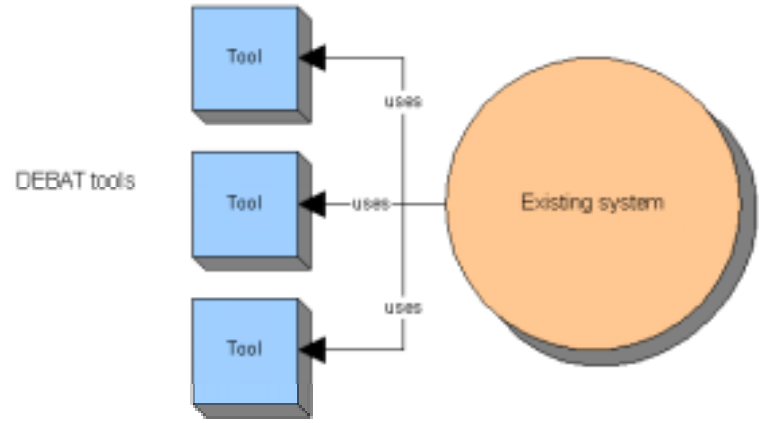
- The challenge is to leverage the current EAST data workshop concepts (set of norms and collections of tools) towards an **unified view of data through a data handling architecture centred on the users needs.**

DEBAT software is intended to provide a set of enhanced tools that support the entire data life cycle



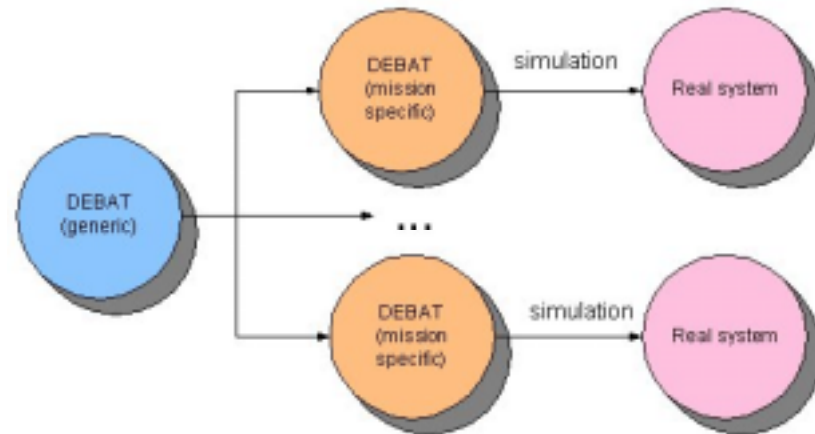
# I - DEBAT features - Scope

- DEBAT as a **data workshop**
  - Users can directly use DEBAT as a series of enhanced tools covering the entire data life cycle (with almost no architectural concept in mind) as it is the current practice with existing EAST tools.
  
- DEBAT as a **generic data infrastructure**
  - This scenario really takes advantage of DEBAT architecture allowing users to build their own system upon the infrastructure provided by DEBAT. This is possible by the enhanced modularity of DEBAT architecture and its strong concepts of dynamic customisation and plug-and-play.



# I - DEBAT features - Scope

- DEBAT for simulation / testing
  - A peculiarly interesting field of application of DEBAT is the simulation/testing arena (for example, within the TM/TC domain). DEBAT should provide generic blocks for easily and cost-efficiently building simulation/testing systems.



# I - DEBAT features - Scope

## ■ Environment

- The DEBAT user shall be able to use the tool on
  - Windows platforms
  - Linux platforms
  - Unix platforms

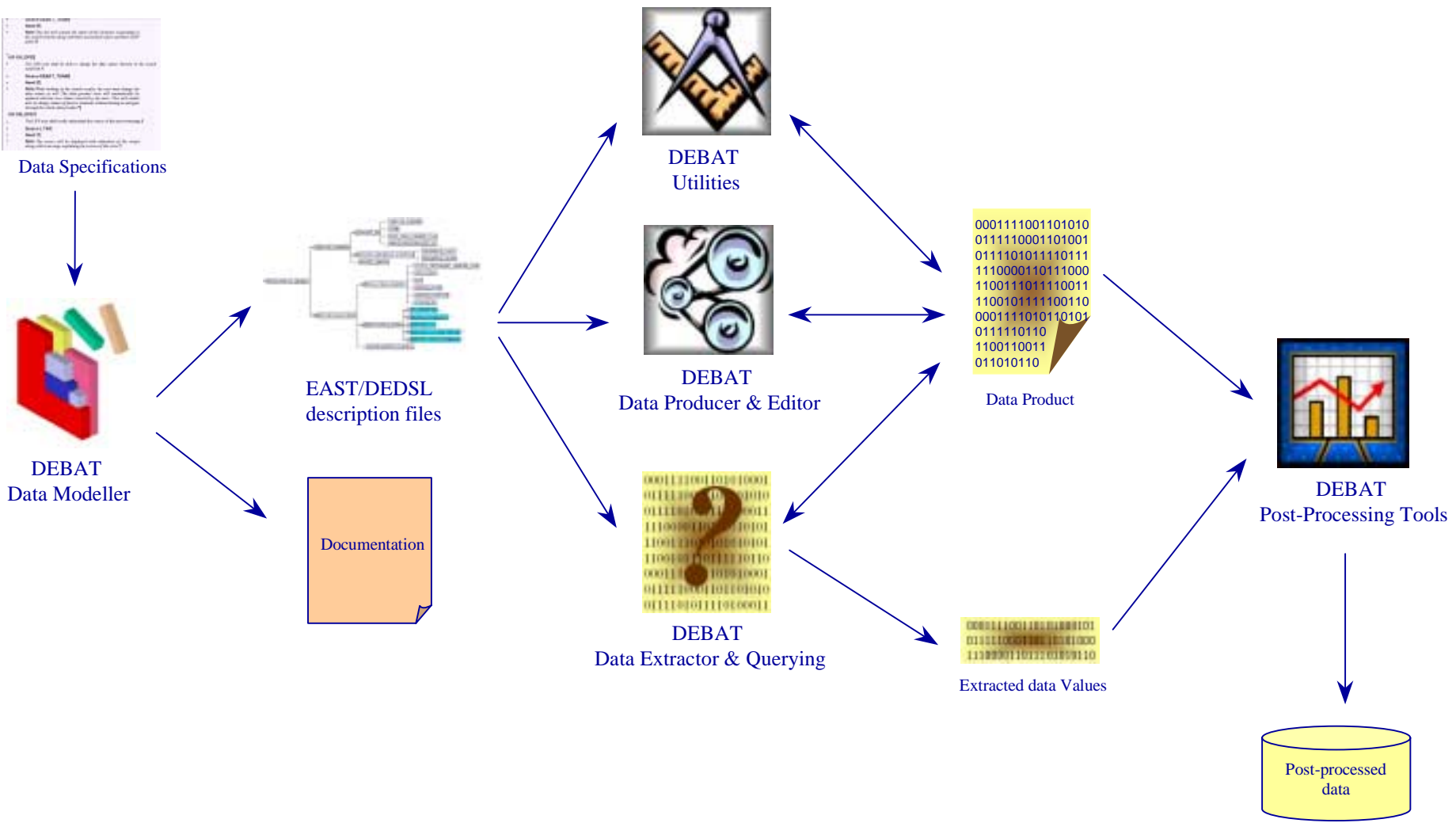
## ■ Legal

- DEBAT shall be developed using **free technologies** and as far as possible open source
- DEBAT shall be **available freely for users** under the form of a binary distribution

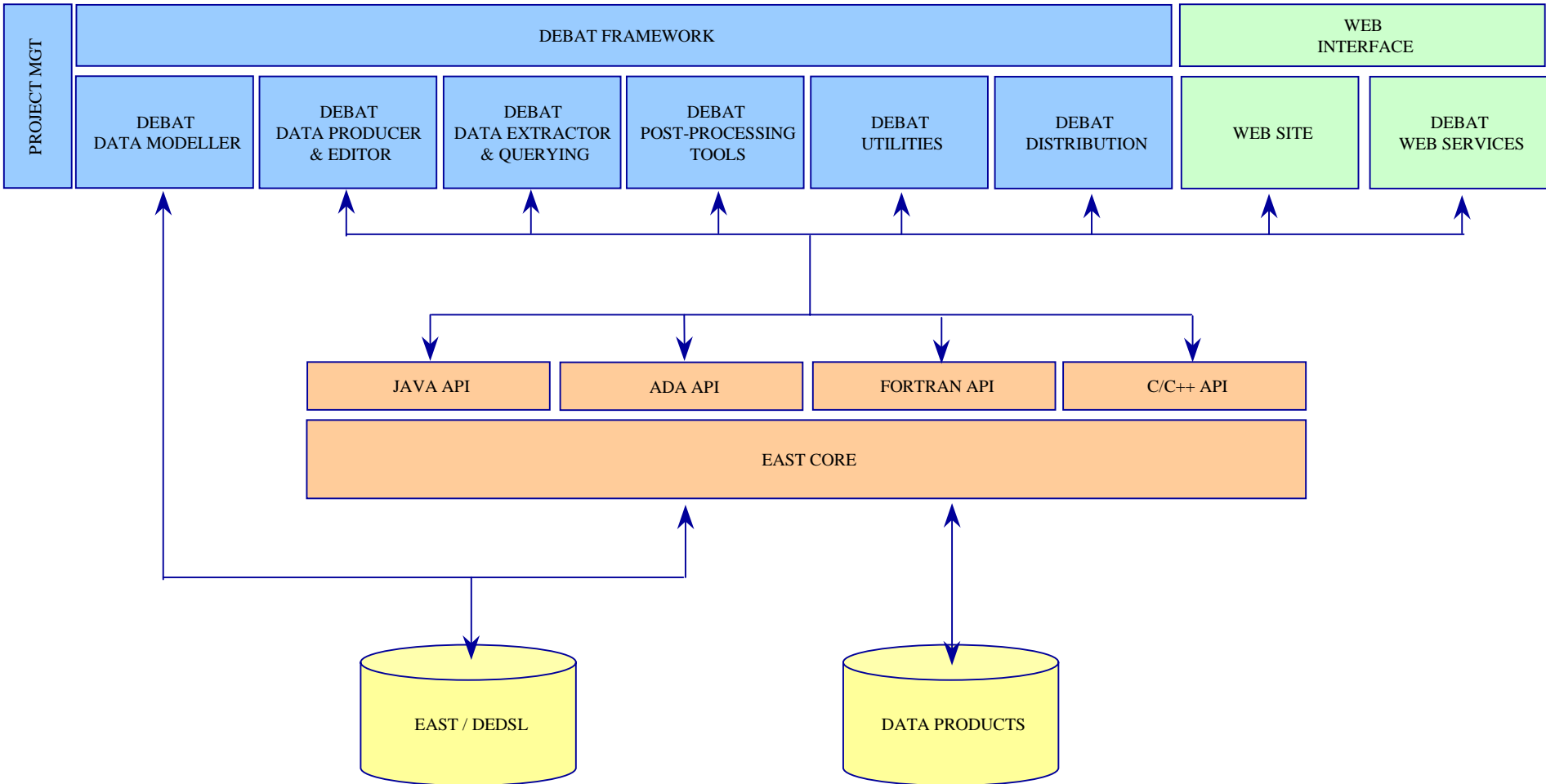
# I - DEBAT features - General features

- ✓ **Modular design** (substitute or add functions later with no impact on other functionalities),
- ✓ **Compatibility with the existing data formats** (e.g. HDF, CDF, XML,...),
- ✓ Openness with the use of **open-standards** like XML,
- ✓ Accessibility both to **novice users** (no knowledge of the EAST technology) through evolved help functions as well as to advanced users (with more knowledge of the EAST technology) through the use of the DEBAT API ,
- ✓ **High performances**,
- ✓ End-users will also be able to use the DEBAT functionalities either from a friendly graphical user interface or as library functions to be linked to the users' applications.

# I - DEBAT features - Tools overview

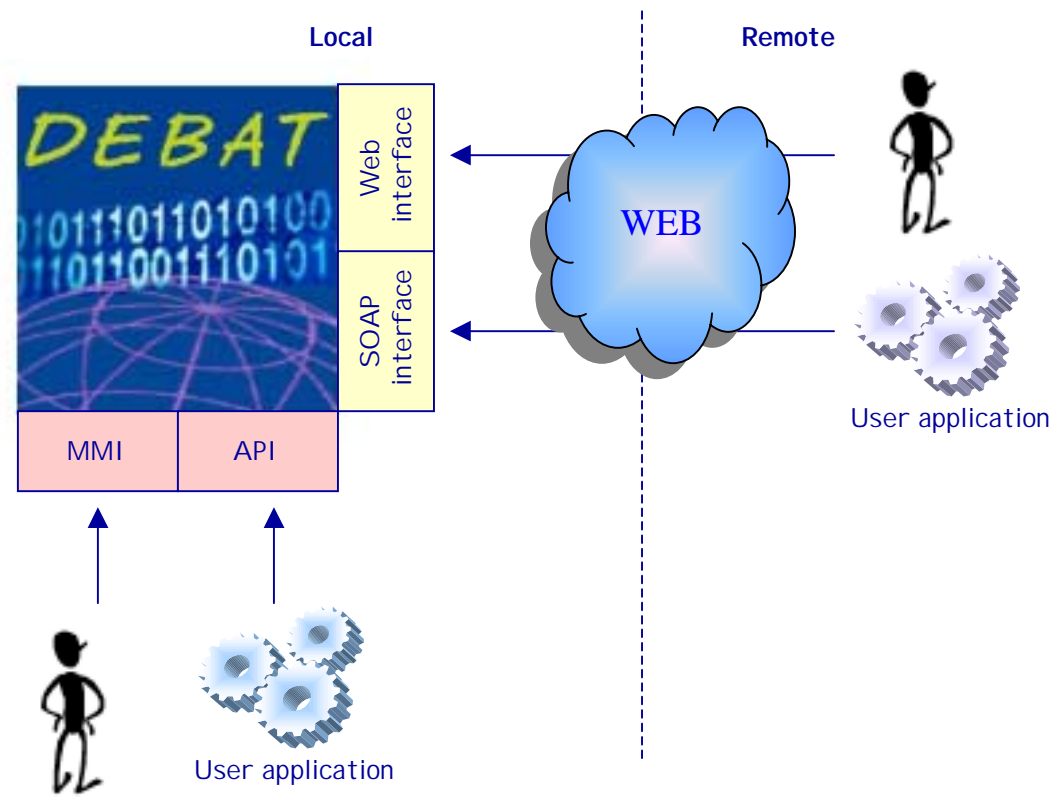


# I - DEBAT features - Tools overview



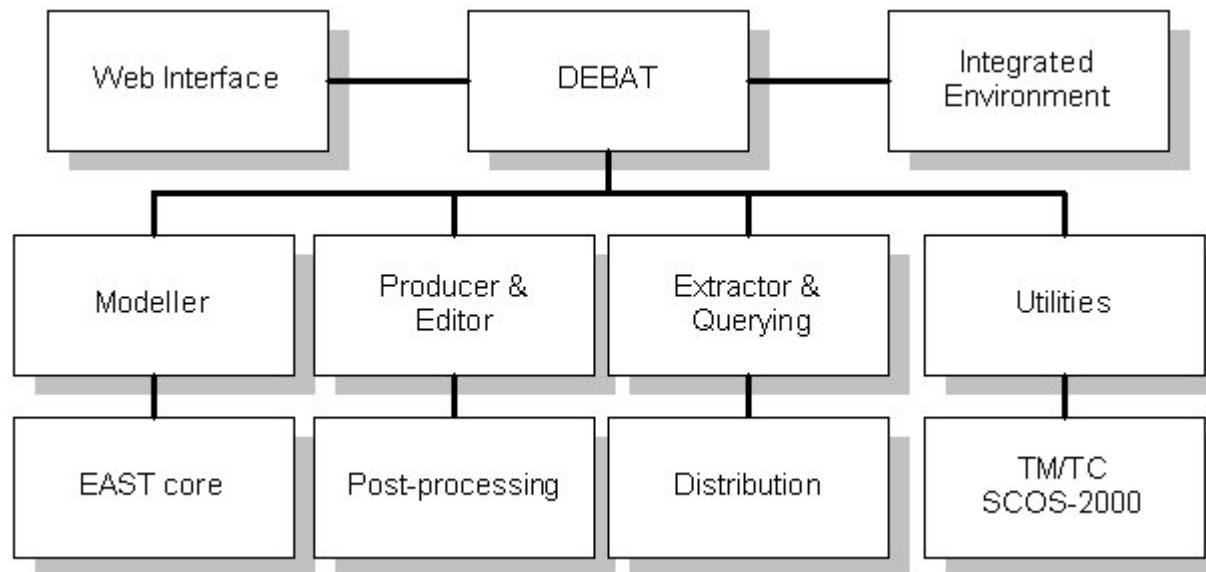
# I - DEBAT features - Operational environment

- DEBAT will be accessible through the following external interfaces
  - **Man Machine Interface** allowing users to run any functionalities of DEBAT tools
  - **API** enabling users to use the DEBAT functionalities inside their own software
  - **Web interface** providing access to a subset of the DEBAT functionalities (the most useful ones) using a Web browser as interface
  - **SOAP interface (Web services):** enabling users to access remotely to some of the functionalities offered in DEBAT



# I - DEBAT features - General capabilities

- The DEBAT user requirements are divided in two categories
  - Capability requirements



- Constraint requirements (performance, environment, reliability, usability, etc)

# I - DEBAT features - General capabilities

- Easy installation:
  - Automatic or custom installation process
- Version management
  - EAST/DEDSL norms, DEBAT tools
- Compatibility
  - The ascending compatibility shall be kept for the EAST norm and DEBAT tools
- On-line help
  - The DEBAT tools shall provide users with an online help that documents the available functionalities
- Internationalisation
- GUI : last available MMI standards, new technologies (e.g Java)
- Customisable documentation generation (RFT, PDF, HTML)
- Printing functionalities

# I - DEBAT features - DEBAT Integrated Environment

## ■ DEBAT framework

- All functionalities accessible through a user-friendly GUI
- DEBAT tools can be launched from the DEBAT framework

## ■ Plug-in system

- External tools can be plugged in the DEBAT framework

## ■ Project management

- A project is common to all DEBAT tools of the framework and consists in a bundle containing: data models, EAST and DEDSL description files, data products, processed data, project documentation
- With no further manipulation, users shall be able to use the data of a project in any DEBAT tool or plugged tool that complies with the data interface specifications of the DEBAT framework



# I - DEBAT features - DEBAT/EAST Core

## ■ General requirements

- All the existing EAST core functionalities will be available in the future version of DEBAT
- The performances of the EAST core shall be improved
- EAST API available in ADA, Fortran, C, C++ and Java

## ■ EAST description handling

- Handling of basic calculation functions (i.e. +, -, \*, /, odd, even)

## ■ Data handling

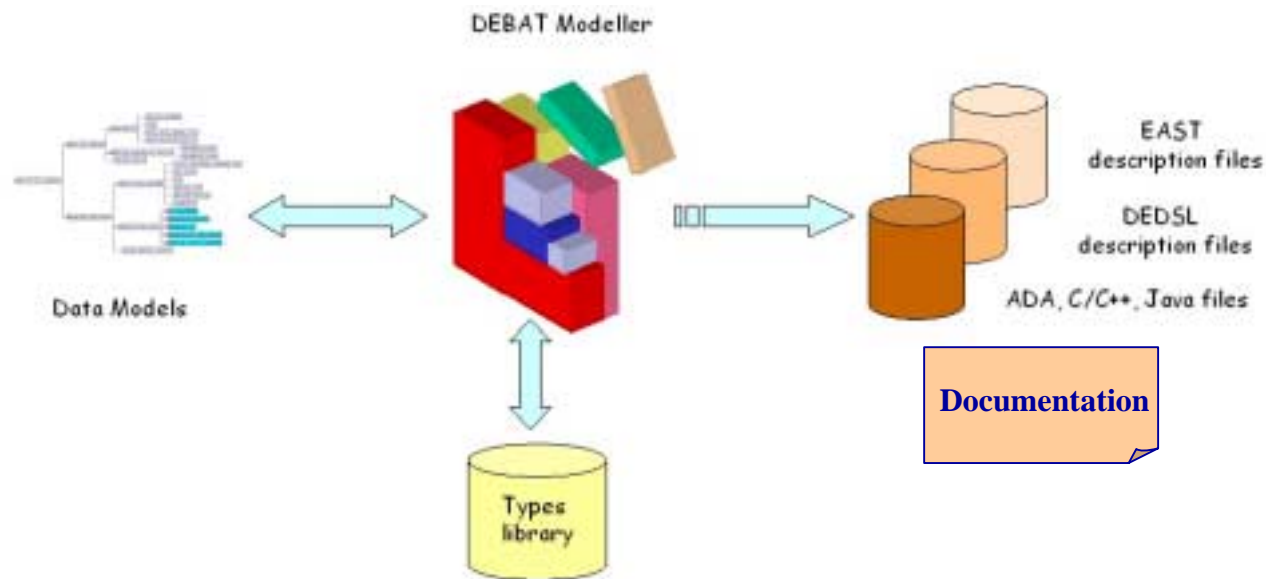
- Reading from the standard input / generation of data on the standard output
- Integer and real format support
- Default values support

## ■ Data Checking

- enhanced data checking
- check data values using computed constraints

# I - DEBAT features - DEBAT Modeller

- Based upon the existing OASIS tool
  - Model the data
    - definition of the logical model (i.e. the data structure, the data type, the range of possible values, etc.), definition of the physical model (i.e. encoding format of the data)
  - Generate documentation about the data



# I - DEBAT features - DEBAT Modeller

- General requirements
  - All the functionalities existing in the current OASIS tool shall be kept in the DEBAT Data Modeller
  - All the bugs found in the current version of the OASIS tool shall be fixed
  - Ascending compatibility for the data model handling
- Model handling
  - Internal format in XML
  - Users shall be able to specify a format to apply when encoding a number (i.e. integer and real) in an ASCII form
  - Users shall be able to specify a default value for the elements
  - Users shall be able to specify basic algorithms for defining the data values
  - handling of non complete data descriptions
- Type handling: use of a type library

# I - DEBAT features - DEBAT Modeller

## ■ GUI

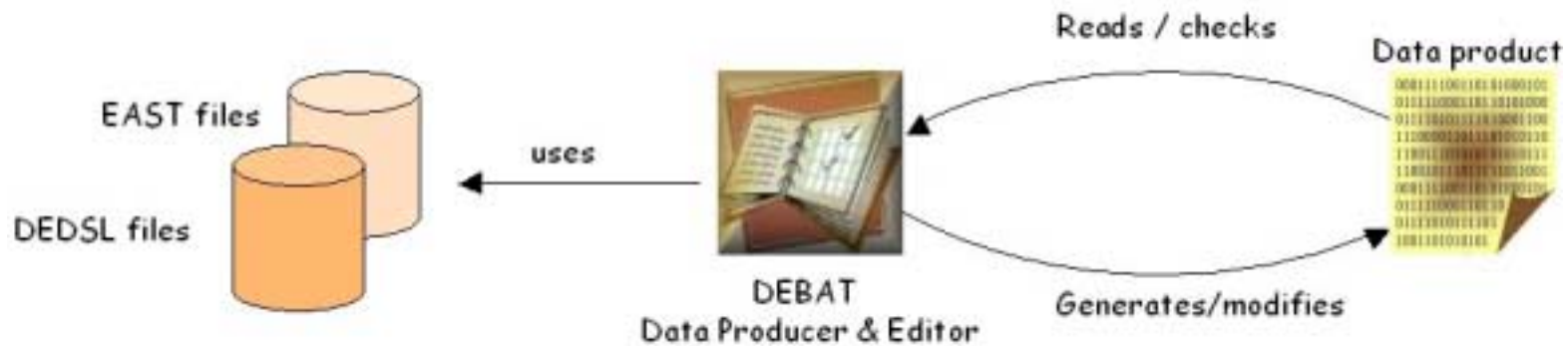
- Hierarchic view presenting the model structure and data types
- Several panels to define the syntactic and semantic parameters of an element
- Improvement of the models manipulation
  - Cut/Copy/Paste functionalities
  - Remove functionalities
  - Shortcuts
  - Element search using syntactic and/or semantic information
  - Zoom, clone a model view

## ■ Programming language support

- Users shall be able to generate type data declarations in ADA, C/C++ and Java

# I - DEBAT features - DEBAT Producer & Editor

- DPE offers an easy access to the data
  - read and display,
  - edit,
  - produce



# I - DEBAT features - DEBAT Producer & Editor

## ■ EAST description handling

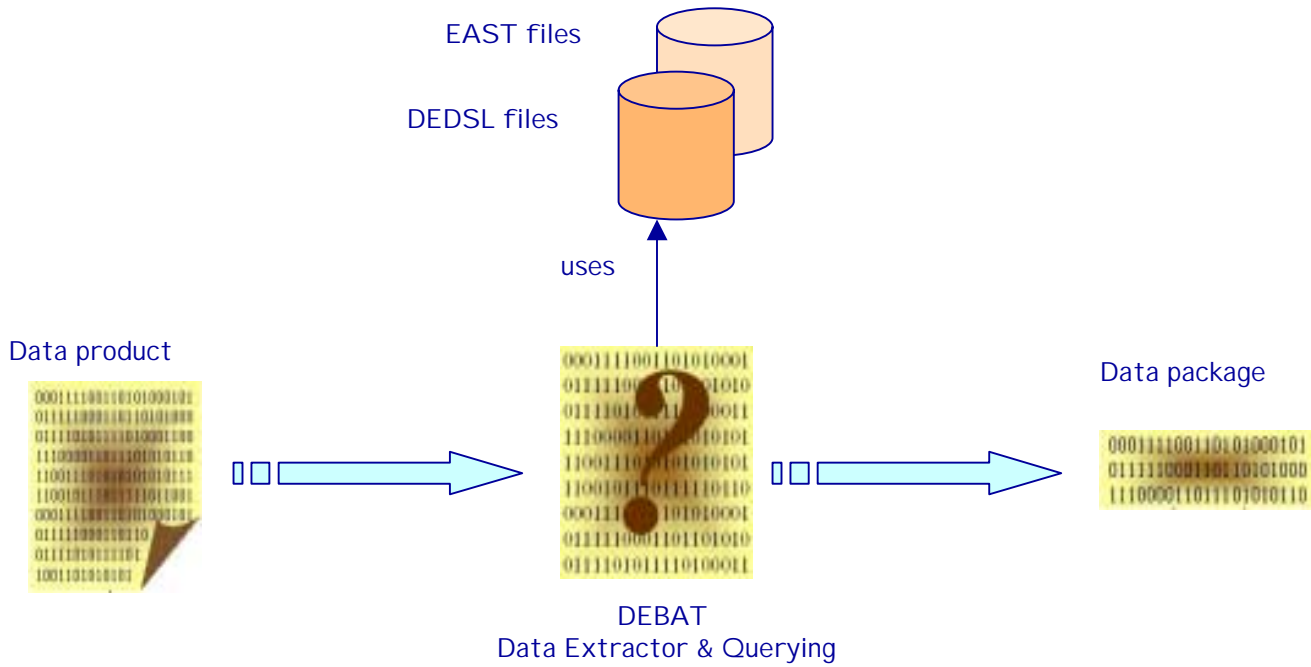
- Different display views : tree view structure, data byte flow structure
- Non complete EAST descriptions display

## ■ Data Generation

- Generation of data on the standard output or in a socket
- Two modes available for the generation process
  - users may let the tool generate all values on its own
  - users may choose to enter some values before generating the whole data product
  - basic algorithms capabilities
- In both cases, users may generate
  - valid data products (all values are corresponding to the syntactic information)
  - wrong data products (some or all values may be incorrect)

# I - DEBAT features - DEBAT Extractor & Querying

- Primarily designed to offer means to **easily extract values (subset, samples,...) from data products** responding to search criteria (e.g. time, value,...) and create new packages upon these results.



# I - DEBAT features -DEBAT Extractor & Querying

## ■ Data Handling

- Reading of data from the standard input or a socket

## ■ Data querying

- Search criteria are: a semantic/syntactic attribute, EAST path, EAST type, element value
- Use of the \* wildcard in search criteria
- Use of comparison functions as search criteria (<, >, =)
- Search results will be displayed in different customisable displays (list, table, tree, etc)

## ■ Data extraction

- XML-like query language to process complex queries on the data products.
- Users shall be able to extract elements resulting of a search

## ■ Batch processing



# I - DEBAT features - DEBAT Utilities

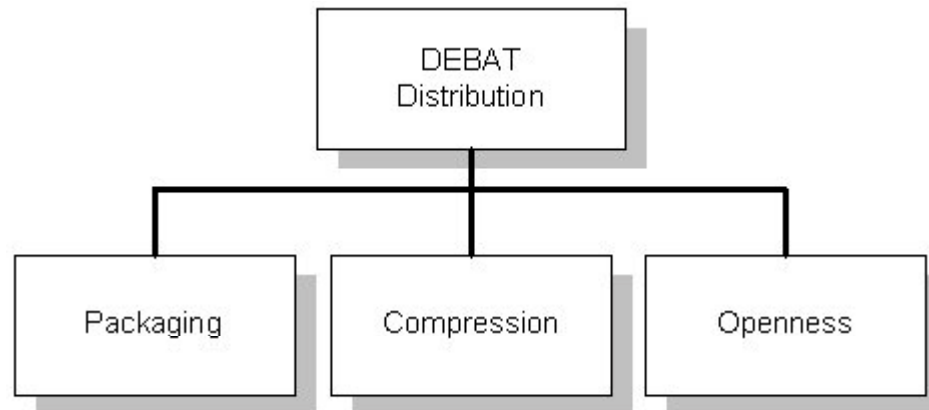
- The DEBAT utilities shall be available from
  - The command line
  - A graphical user interface
- The utilities are
  - ASCII\_DUMP: produce an ASCII or XML view representing a data file associated with an EAST description
  - DATA\_CHECKER: check data products against EAST descriptions
  - Comparison tool: visualise the differences between two EAST descriptions
  - User plugged tools ...

# I - DEBAT features - DEBAT Post-Processing tools

- The post-processing tools are
  - 2D graphical tool
    - Plot data stored in an EAST product
    - Print and export graphics in various formats (jpeg, png)
  - CAO interface
    - Registration of EAST and DEDSL descriptions in the CAO
    - Extraction/search of EAST and DEDSL descriptions from the CAO
  - Database interface
    - Store data product values in a database
    - Create data products using values stored in a database
  - Format transformation
    - CDF <-> EAST, HDF <-> EAST
    - EAST -> XML
    - Raw data files -> XML
  - Quick looks
  - User plugged tools

# I - DEBAT features - DEBAT Distribution

- The distribution phase comes at the end of the data life cycle. The main goal of this part is to disseminate data packages (e.g. data alone, data along with its documentation) to very end-users.



# I - DEBAT features - DEBAT Web

- Web site
  - A local Web site is provided in DEBAT for users to be able to use some of the functionalities using a Web browser as interface.
  
- Web services (SOAP)
  - Web services are small server-side components. In this case, a specific client software is required to access these functionalities remotely

	Web Site	Web services
Check that an EAST description is valid against the EAST norm	✓	✓
Check that a data product is conform to a particular EAST description	✓	✓
Transform a data product and associated EAST description into XML	✓	✓
Visualise data products with a 2D graphical tool	✓	
Online help	✓	

	Web Site	Web services
Read an EAST description	✓	✓
Read a data product	✓	✓
Generate a data product	✓	✓
Search elements	✓	
Extract elements from a data product	✓	✓

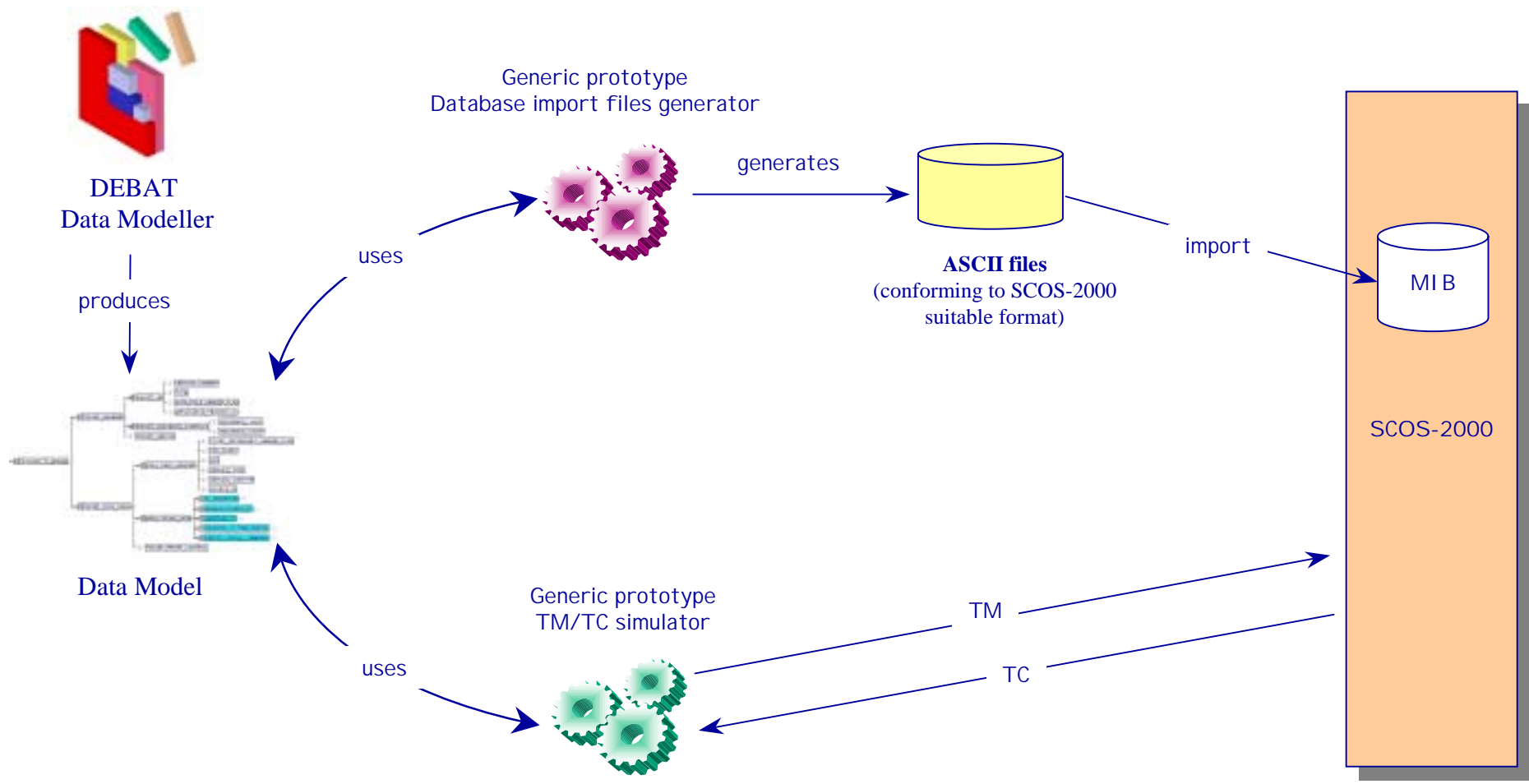


# I - DEBAT features - DEBAT for TM/TC

- The requirements concerning the TM/TC and SCOS-2000 activities are divided in two main fields:
  - The EAST technology, thanks to its interesting features (modelling of binary data, separation between the model and the data, etc) **will be able to model TM and TC packets** that are conform to the ESA Packet Utilisation Standard.
  - The DEBAT tools can be used for two different purposes within SCOS-2000:
    - Improvement of the SCOS-2000 database import process by providing generic means to automatically generate some import files from the TM/TC packets models.
    - Simulation for testing/debugging of the TM/TC processing chains.

In order to achieve these goals, the DEBAT tools will provide **two prototypes** to demonstrate the “proof of concept”.

# I - DEBAT features - DEBAT for TM/TC





## II - DEBAT perspectives

# EAST and DEBAT

- Principle:
  - technically sound
  - formally accepted
  - proven in the field
  
- Implementation:
  - tools can be improved
  - absence of type library sorely felt
  - some limitations with respect to variable size fields
  - some features of TM/TC not supported

These aspects are being addressed in DEBAT

- DEBAT starts from a very good base

# EAST and DEBAT

- additional factors:
  - a User Group has been nominated, enhancements are not being made in isolation
  - enhanced EAST will be supported by CNES and ESA
  - distribution will be on same basis as current EAST, free binary license
  - coexistence with XML based tools is possible, and is being actively pursued
  - one significant enhancement has already been implemented
- the only thing EAST/DEBAT needs is users

# EAST and DEBAT

- Exchange of information, from the project's side:
  - we will try to keep actively up to date with developments
  - there already is a project Web page:  
[earth.esa.int/rtd](http://earth.esa.int/rtd)
  - an expanded one is being prepared, will be linked from the above
- from the potential user's side
  - make yourselves heard
  - let us know of any special needs
  - if you would like to try, experiment, test ...