

Complementing EDA with Meta-Modelling & Code Generation

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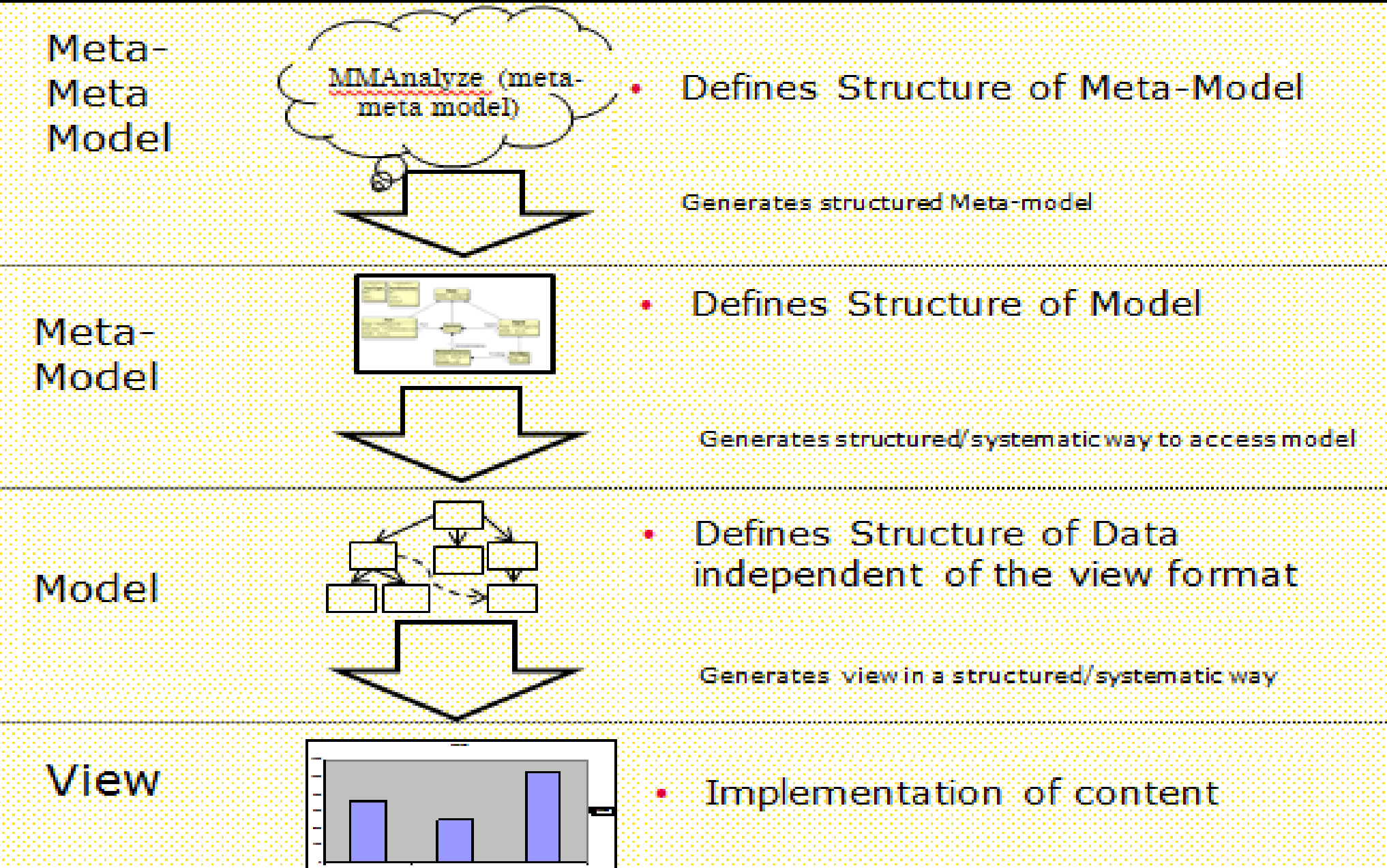
MOTIVATION

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- EDA tools normally cater large number of customers and create generic tools to improve design flows through automation.
- Development cost of EDA tools is very high.
- EDA cannot focus on domain specific tools as design companies cannot afford to pay for such tools.
- Automation is the key to make designers more efficient so need for such tools cannot be ignored.
- Designer normally does not have expertise to build such tools.

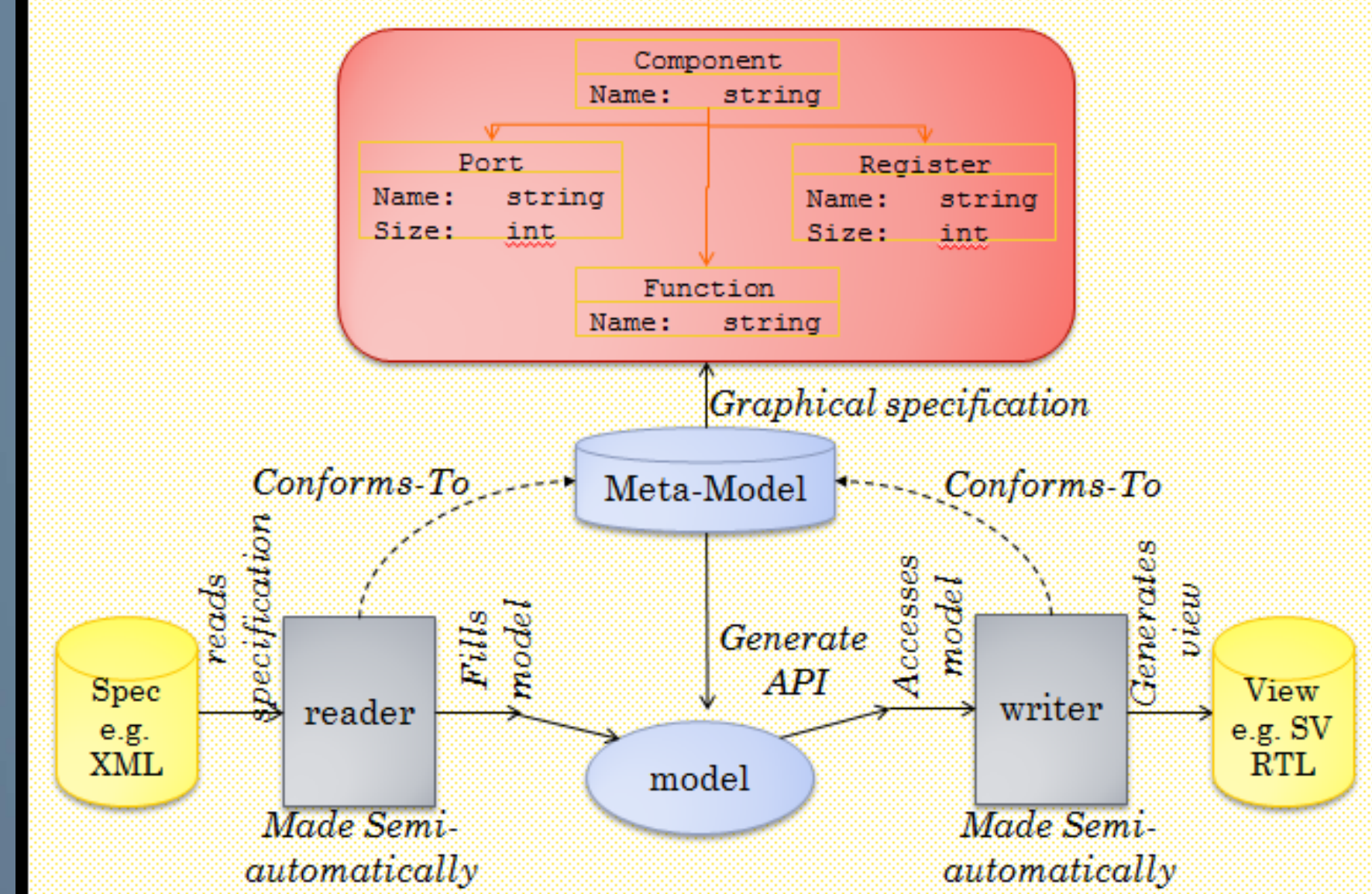
ABSTRACTION

LEVELS OF ABSTRACTION



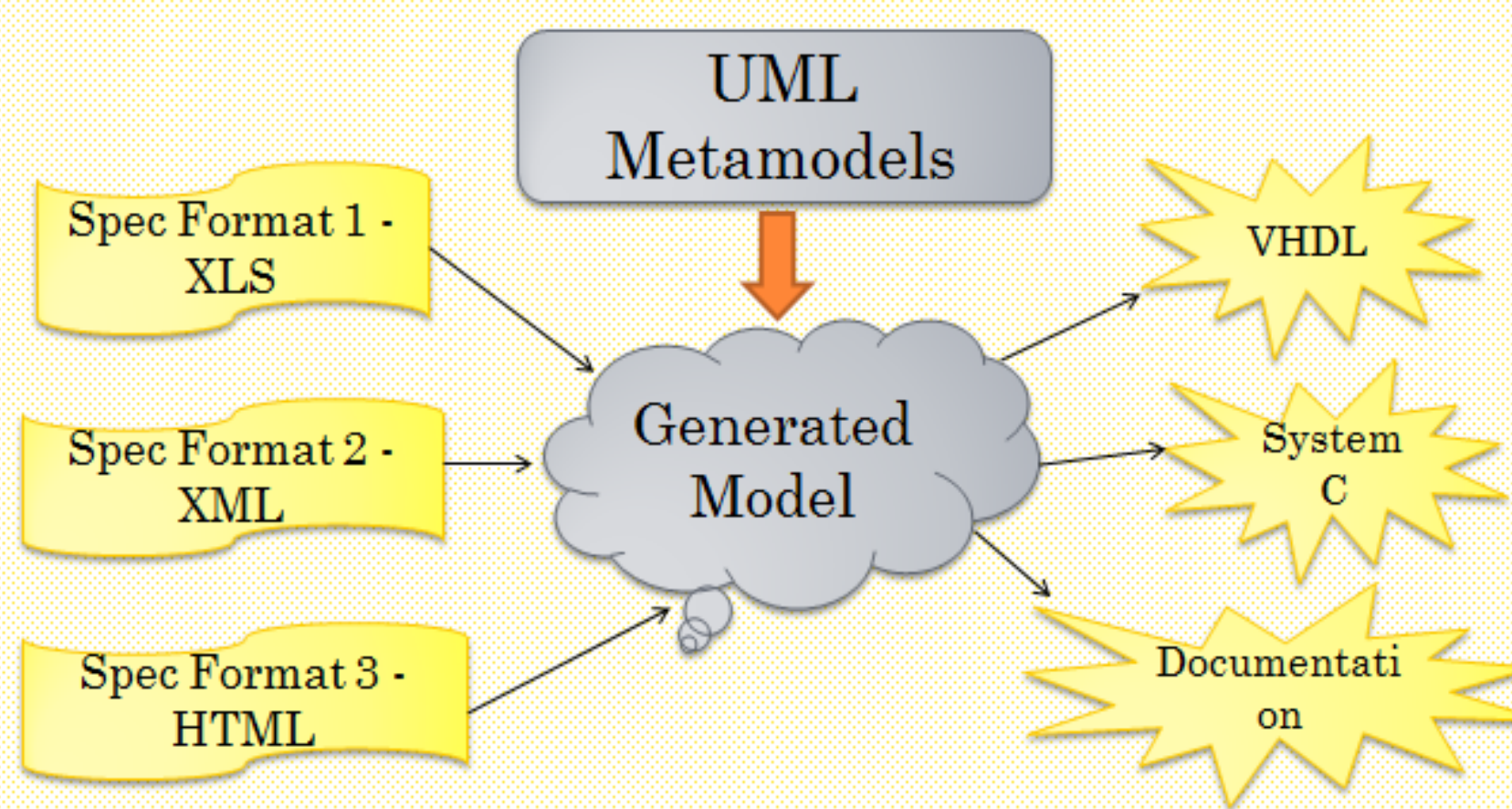
FRAMEWORK & FEATURES

INFRA-STRUCTURE



FLEXIBILITY

Same model used for multiple Input & Output formats.

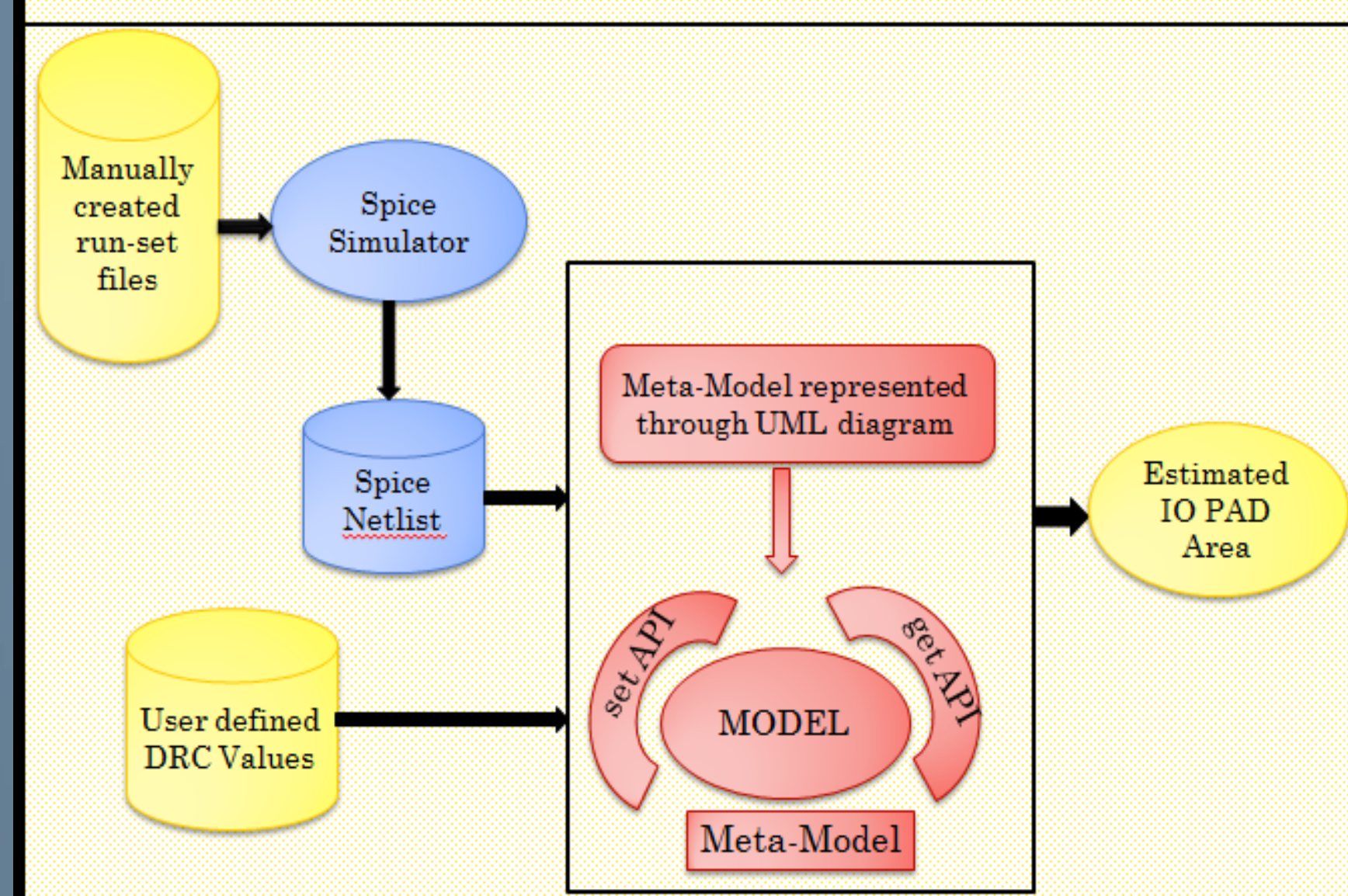


FEATURES

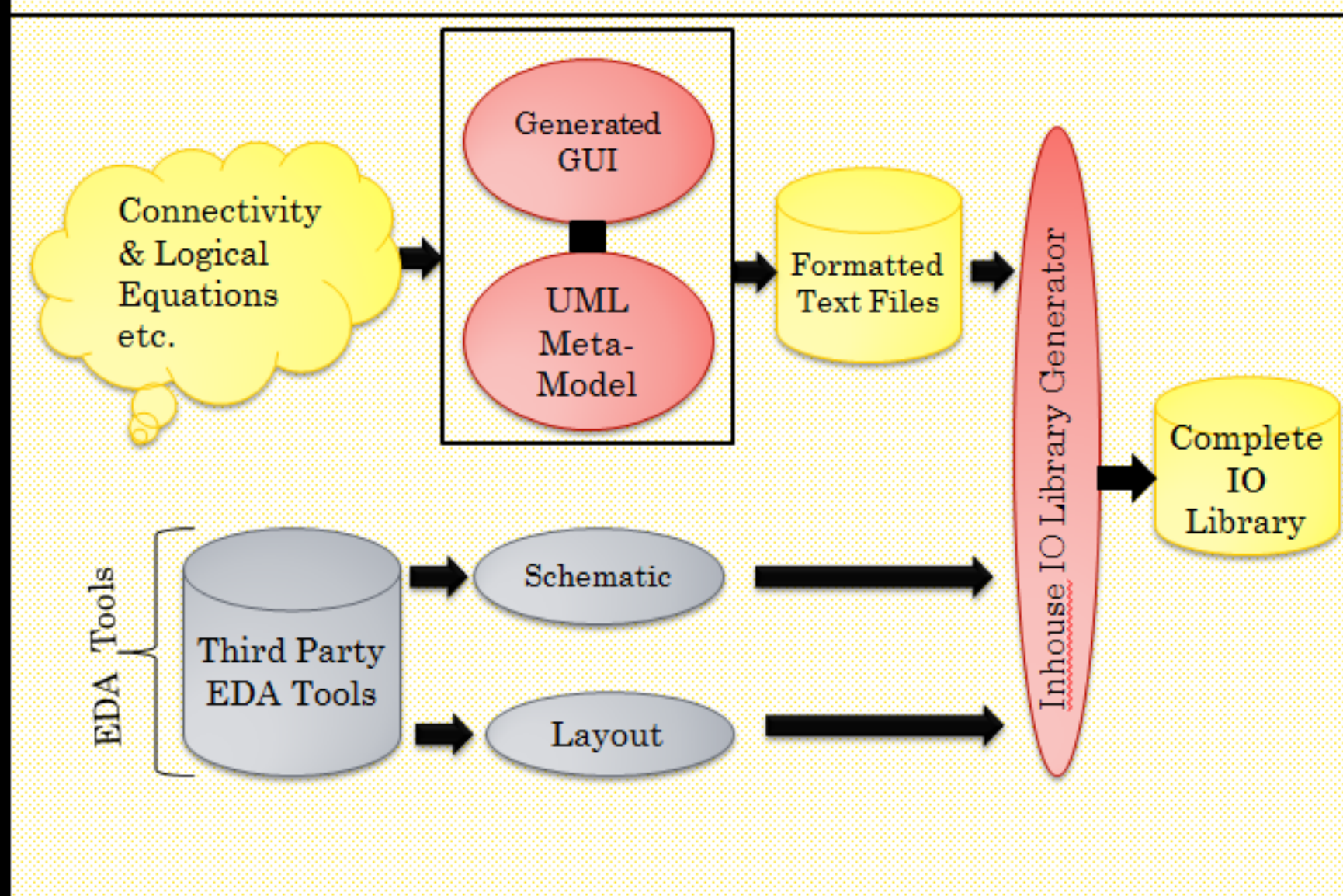
- Reusability**
 - VHDL/Verilog parsers, etc. are integrated in infra-structure.
- Extendibility**
 - Model can be easily extended by extension mechanism.
- Linkability**
 - Multiple models can be linked to make complex data structures.
- Transferability**
 - Created models can be easily exchanged and understood between designers as data structure has a visual look.

APPLICATION & BENEFITS

IO PAD AREA ESTIMATOR



IO LIB INFO COLLECTOR



BENEFITS

- Productivity Improvement**
 - Automation leads to better productivity
- Quality Increase**
 - Copy/Paste errors are eliminated due to automation
- Productivity Improvement in application of EDA tools**
 - Tools can be designed to reduce entry barriers to EDA tools
- Consistency Increase due to single source model**
 - Code, documentation, etc. are generated from single source
- Easier to incorporate late specification changes**
 - Framework is based on generation and hence late changes can be accounted.

CHALLENGES & CONCLUSION

CHALLENGES OF TECHNOLOGY

- Learning curve for designers to learn the modelling infrastructure.
- Designer must know his/ her job very well in order to automate the same.
- Designer must understand what can be automated in design flow so that he can reshape his flow towards an automated flow.
- Takes sometime for designer to learn the infrastructure and integrate it in his flow. Management needs to understand and support it.
- The current framework is generated in Python. There are constant language wars: Perl, Python, Tcl etc.
- The automation eases the design flow so much that the designer becomes more interested in code generation than designing.

CONCLUSION

- This technology is not to create already existing EDA tools and reinvent the wheel
- It is mainly used to create domain specific tools and to help increase efficiency of using EDA tools.
- So in one sense it extends EDA and helps making designers more efficient.
- It profits from Meta-Modeling features to assure flexibility, consistency and reusability of the design flow.
- Similar to any other technology, the designer should invest some time to understand this technology before he can use it productively.

