VANDERBILT UNIVERSITY
INSTITUTE FOR SOFTWARE
INTEGRATED SYSTEMS

Model-Integrated Computing: 20 Years and still going… … but where? Quo vadis, MIC?

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What is it?

- *Programming* and *building* systems from and with models, where you can define your own modeling language.
  - Higher-order programming
  - Visual programming
  - Systems engineering with models
  - Modeling + Analysis + Generation
  - ….
  - System construction via domain-specific models.

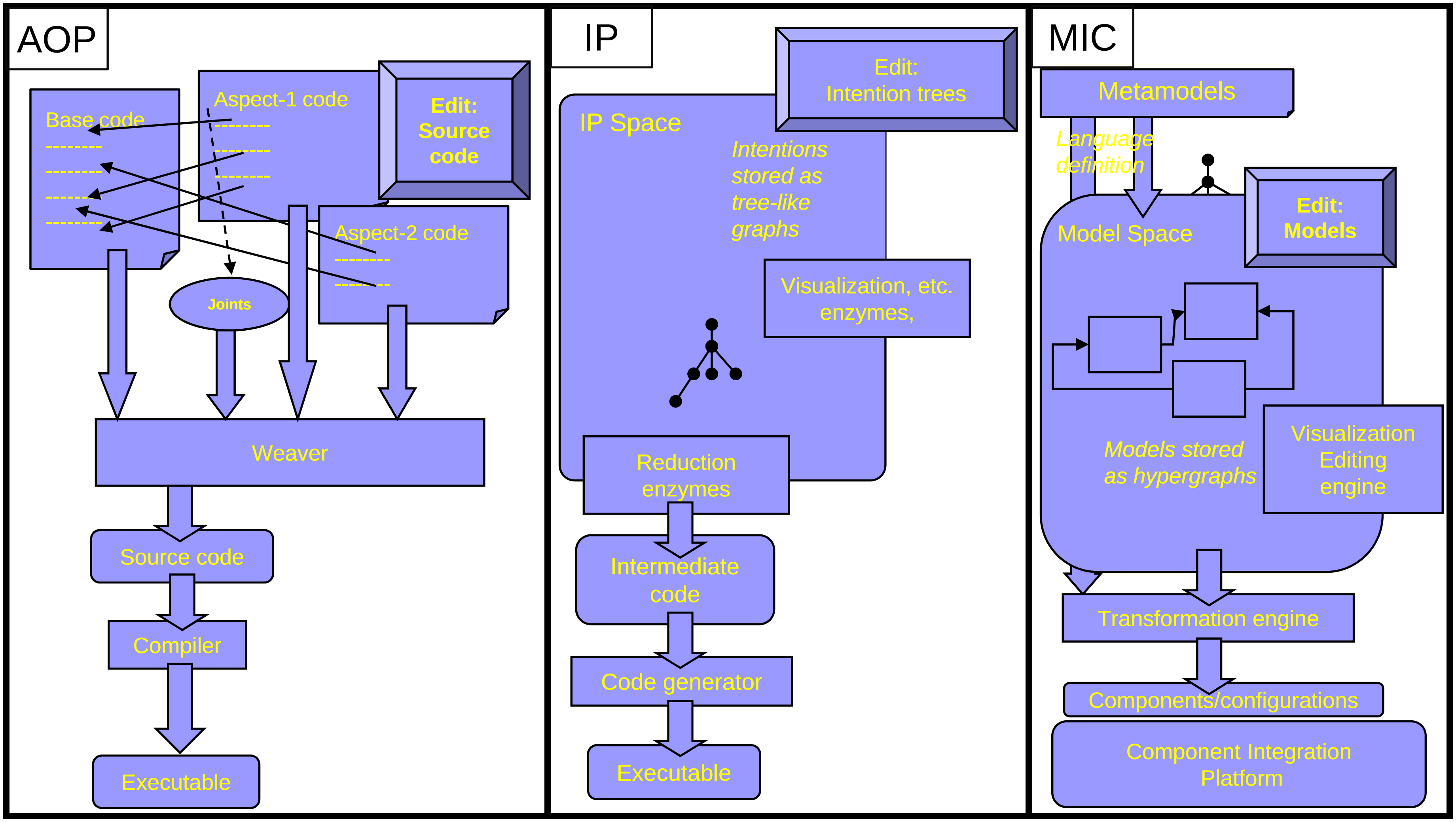
How is it done?

- Figure out what you need… to generate
- Define your own modeling language…. or modify an existing one
- Try out your language
- If you like it, figure out how to translate your models into something what you *really* need.
- Iterate until you get it right

OK, so what can we do?

- Generate code from models
  - □ Glue (‘boring’) code
  - □ Functional code
- Generate non-code from models
  - □ Docs
  - □ Other models ← Analysis!
  - □ Build scripts
  - □ …???
- Integrate systems via models

How about other, generative approaches?



Economics: Is it worth it?

- With MIC, you build custom languages (with explicit abstractions) and build or integrate tools to solve problems
  - Amortize the cost of language and tool building over the entire software development
- → If the language/tools give you more gains than the effort it took to build them, SURE!

What we need to do…

- Use MIC for building real systems
  - □ More FCS-like projects, not demo systems

  … a.k.a. ‘*eat (more) of your own dogfood*’.
- Figure our how MIC fits together with existing development techniques
  - □ Integrating model-generated and hand-written code
  - □ Testing, continuous integration, version control, etc.

Industry perception about MDA today: it is useless because you model, and then you have to do the same things what you would be doing anyway, and pretty pictures don’t help much.

What we need to do…

- Rethinking the (meta-)toolchain
  - What platform and what language?
  - Scripting and component integration?
  - Relationship to standards (real and de facto)?
  - Doing simple things in a simple way?
  - Weaving models and text(ual languages)
  - Working in the large

What we need to do…

- Build some more foundations
  - Model execution? (as in ‘quick feedback for the designer’)
  - A language ‘lab’ for rapid experimentation?
  - Model debugging?
  - That little matter of semantics…
  - Trust but verify…

In summary…

- MDE is being recognized today but it has not reached its full potential yet
  - □ Too much snake-oil, too many research prototypes, too few working systems built
- With MIC we have an opportunity
  - □ But we have to run very hard just to stay in place ☺