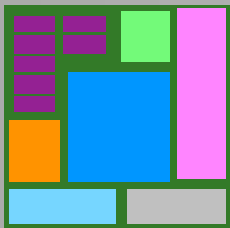


A Proposed Approach to the Development of Federated Model Sets

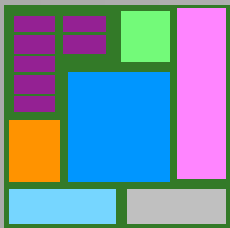
Mark Bryden

Computers will **gather of information and format** it
for decision makers ...



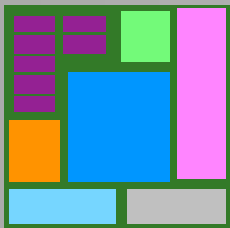
1958 - Leavitt and Whisler

**design workbenches, modeling playgrounds,
problem solving environments, design sandboxes,
integrated computational environments**

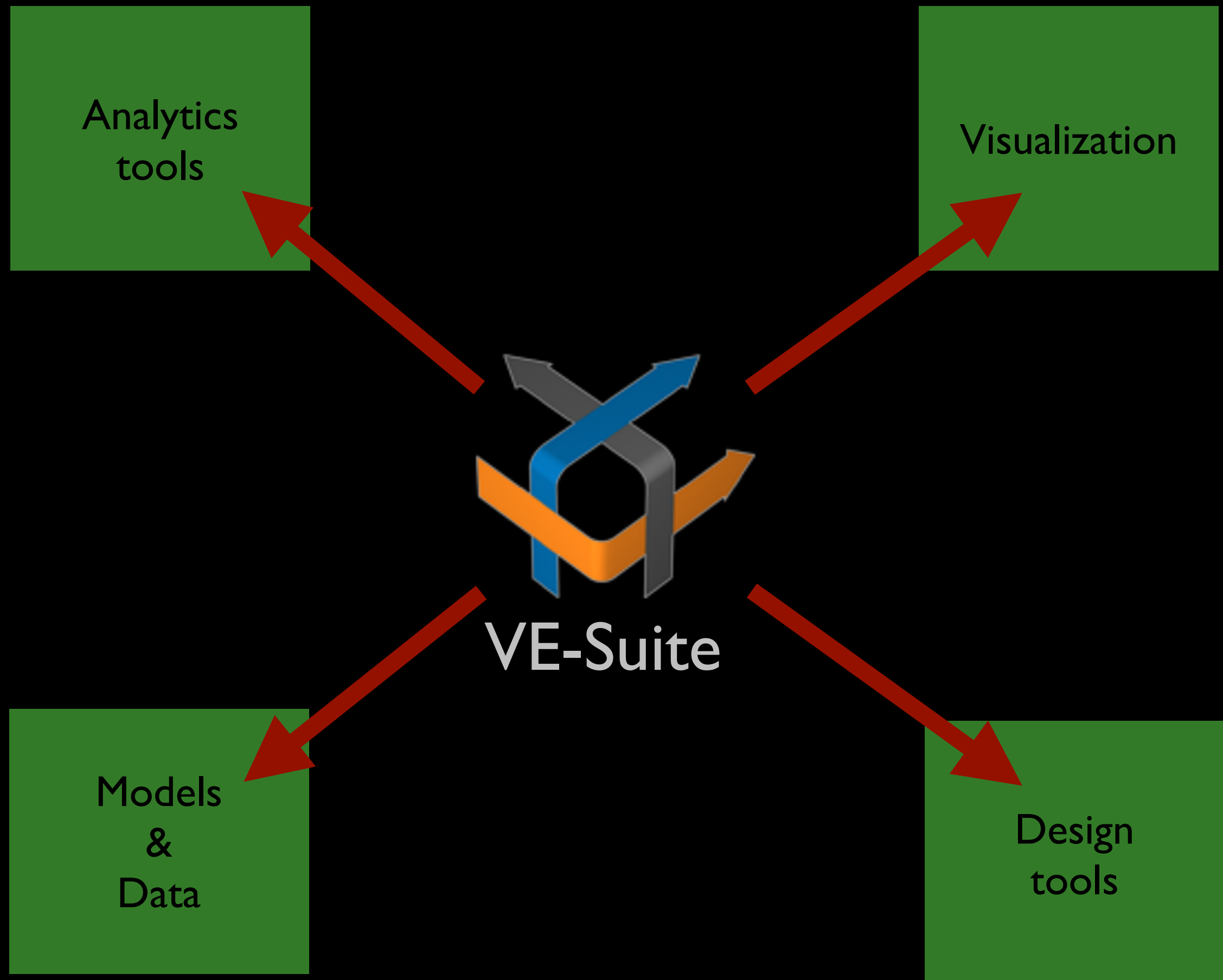


Unified design environments

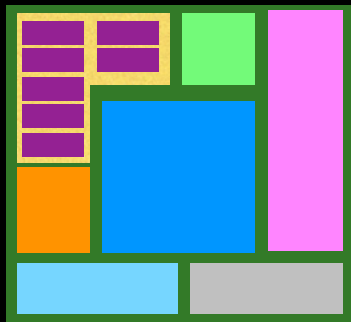
Decision making environments that integrate all the information, models, and other artifacts related to a product or process.



What if ...

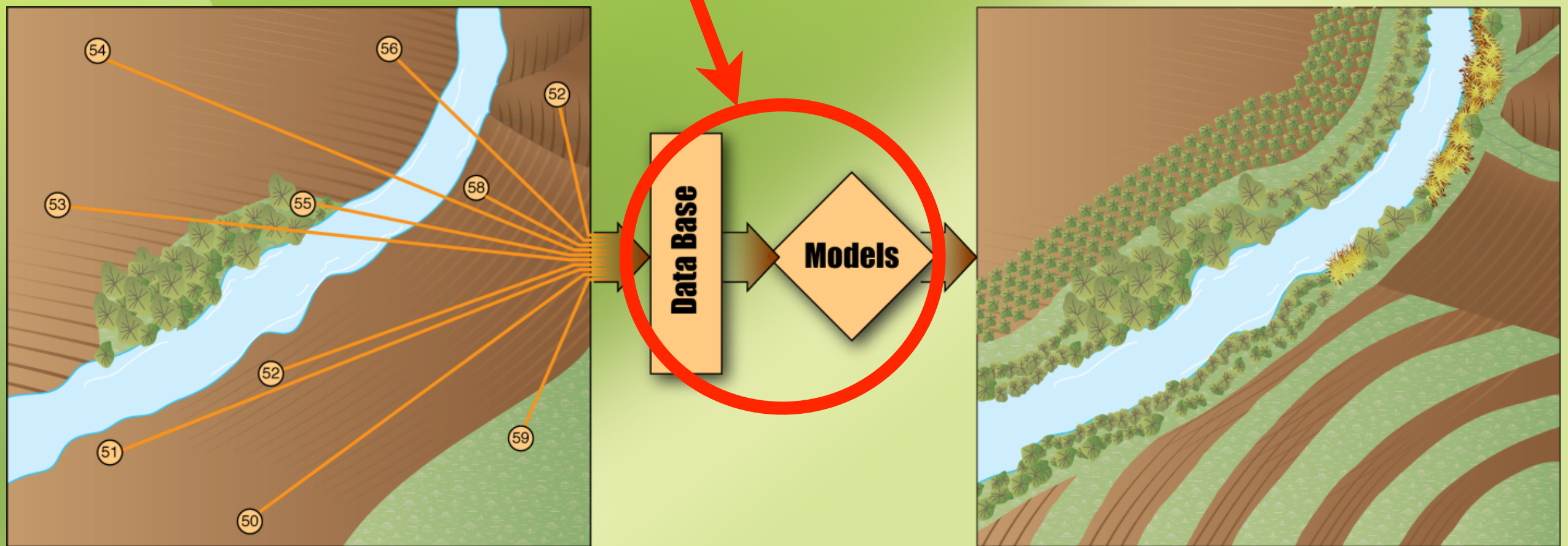


- Massive data sets
- Any data source
- Any visualization platform
- Any compute platform
- osgBullet/osgWorks/latticeFX



VE-Suite

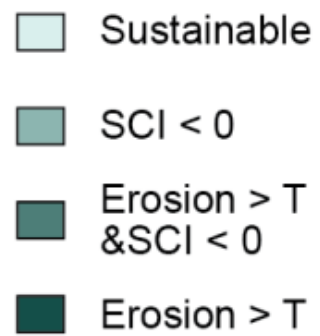
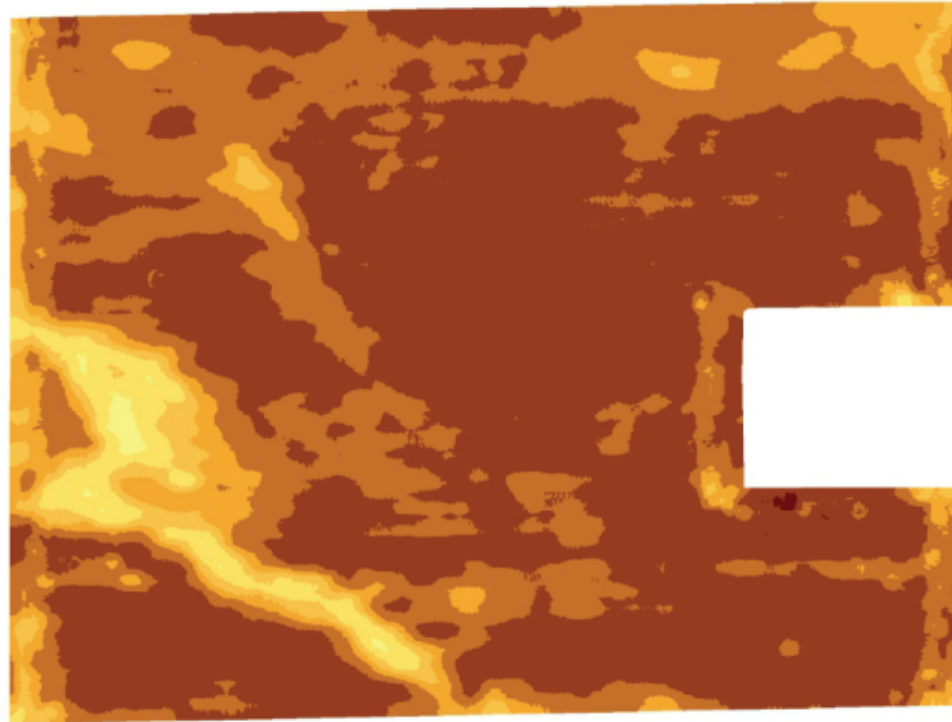
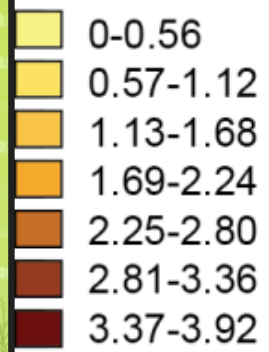
- cover crops
- variable rate residue removal
- Integrated cropping systems
- Landscape management



10-GA50663-02

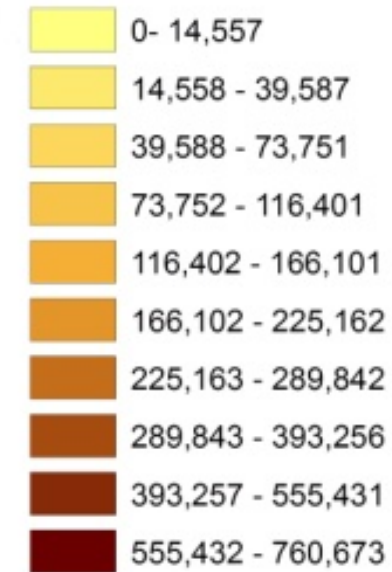
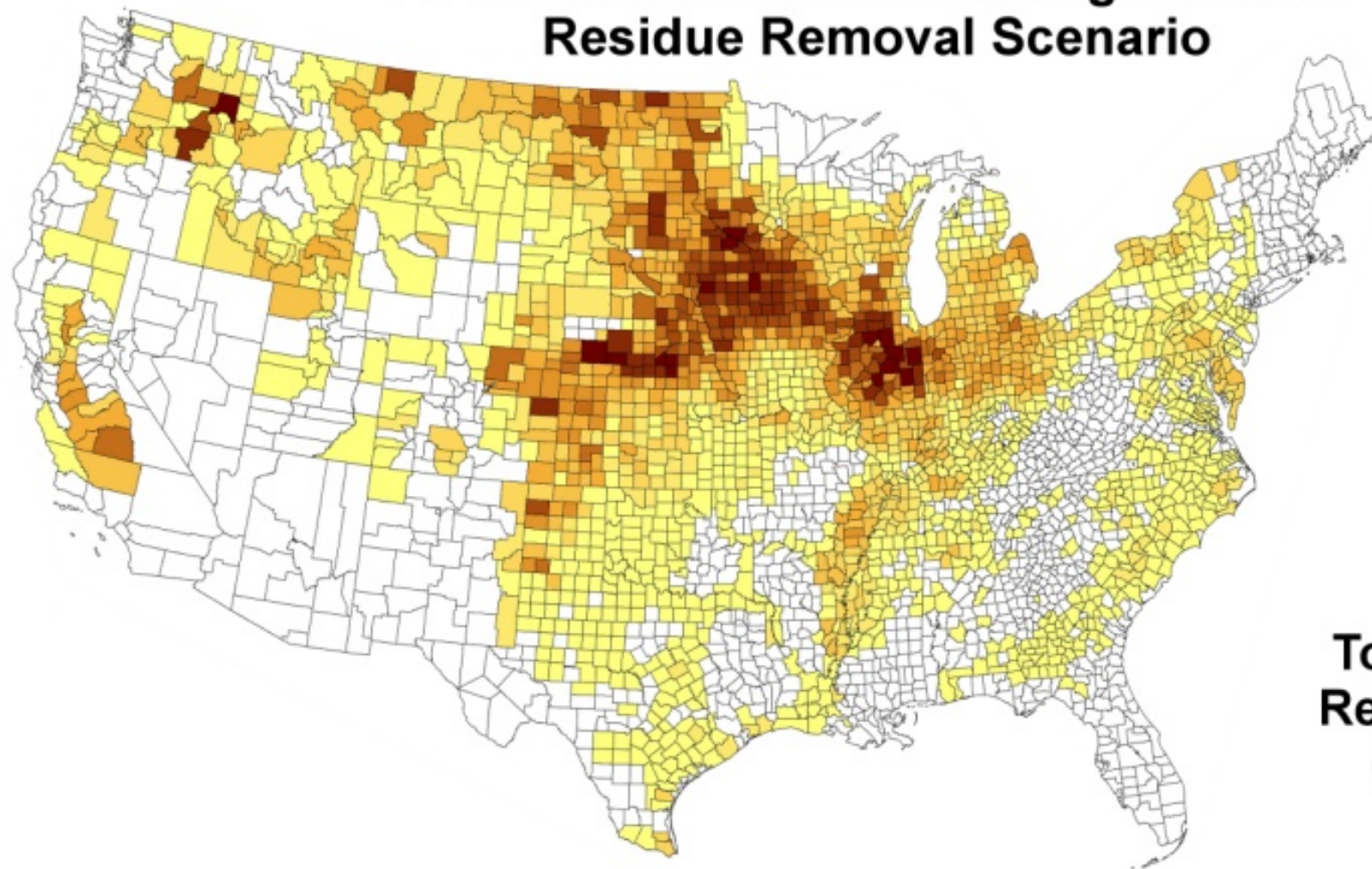
Agronomic strategies

Residue
Removal Rate
(Mg ha⁻¹)

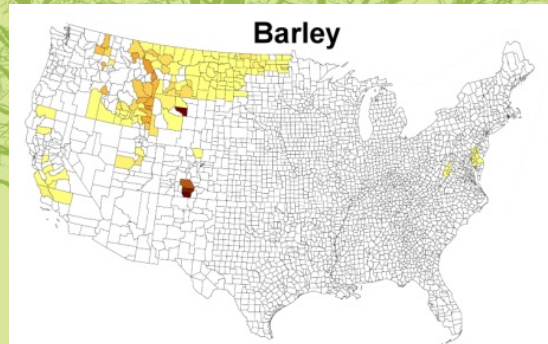
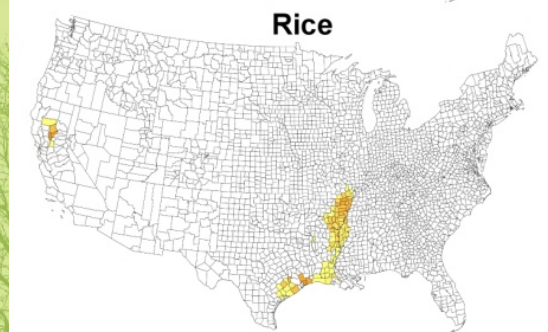
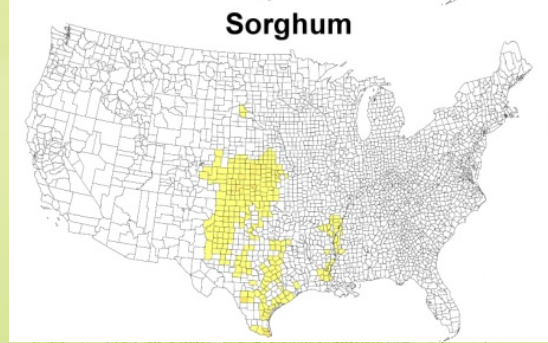
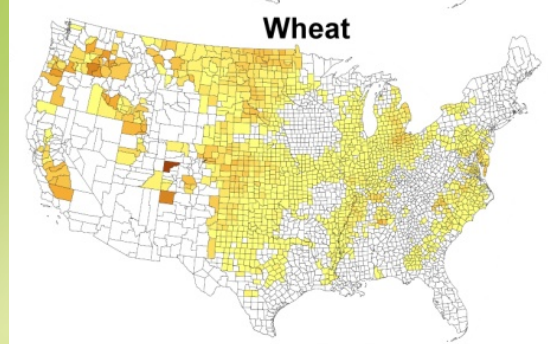
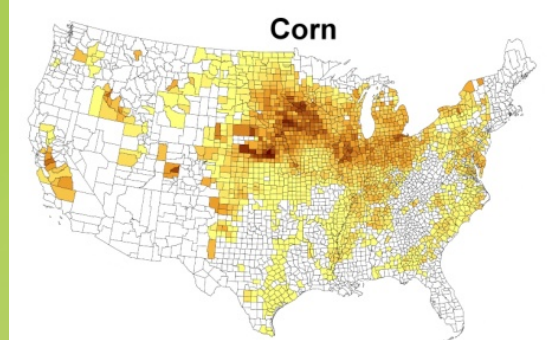


Field 1

2011 National Sustainable Agricultural Residue Removal Scenario

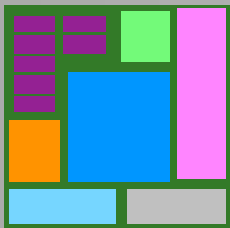


**Total Sustainable
Residue Produced
(metric tons)**



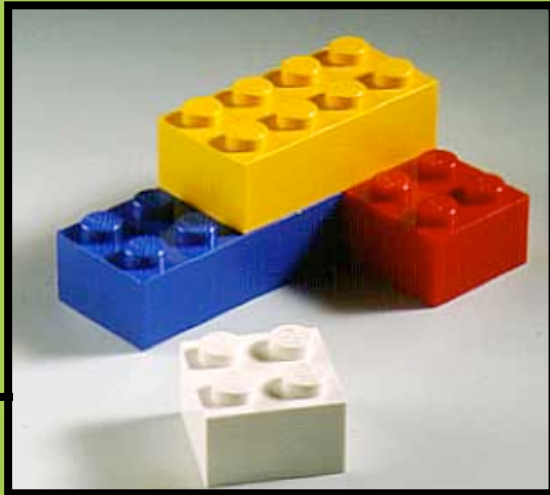
Sustainable residue on a national scale

Computers will **gather of information and format** it
for decision makers ...

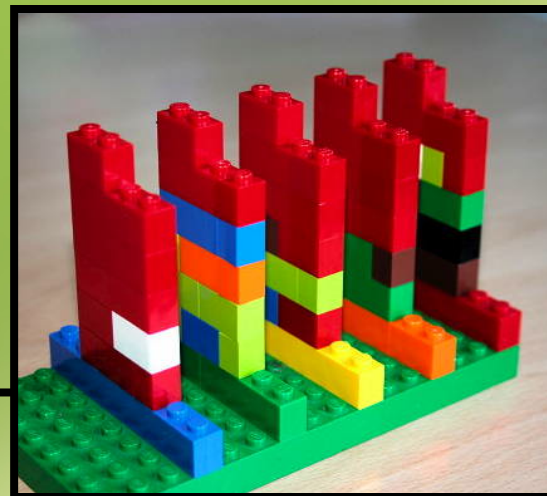


Old decision making paradigm

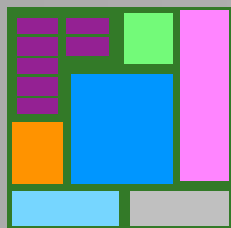
Snap



Build



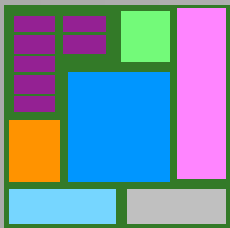
Do



New decision making paradigm

“... a centralized model encompassing a set of other models”

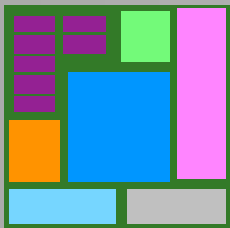
- **integration framework**
- **global ontology and semantics**



“... a centralized model encompassing a set of other models”

- **integration framework**
- **global ontology and semantics**

Pre-determined meta model



model autonomy

high

low

unified models
(frameworks with normalized semantics)

federated model sets
(autonomous models with peer-to-peer controls)

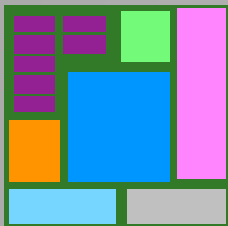
centralized models
(one code with unified schema)

composite models
(one code with scripting)

low

high

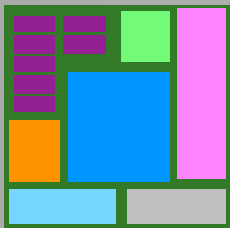
ontological and semantic independence



Model portability

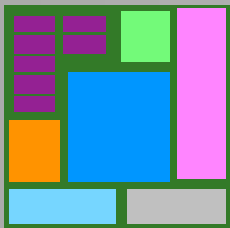
To provide

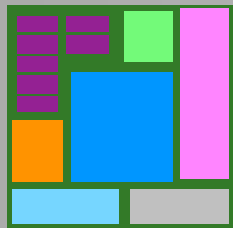
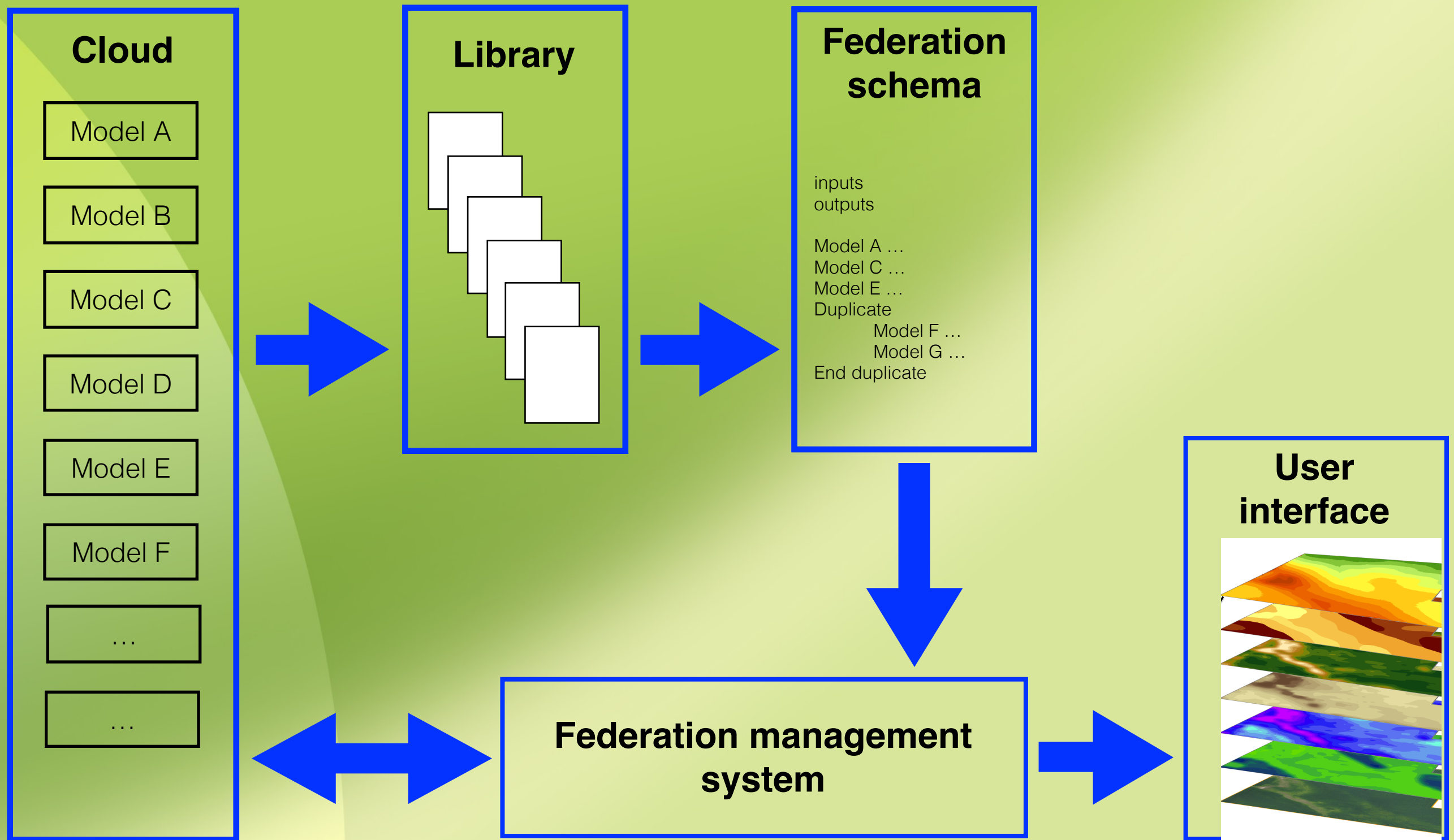
- high degree of independence for component models;
- a common, light-weight mechanism for model linkage; and
- a basis for deploying the federated model set.



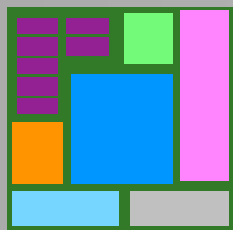
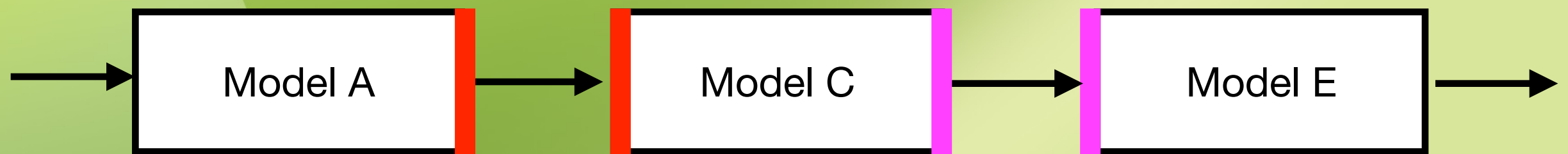
Goal of developing a new architecture

- **Constituency**
the capability of models to come together in groups that have coherence and substitutability
- **Articulation**
a simple and precise mechanism for describing how the models are chosen, linked, executed, and results reported
- **Convergence**
a knowledge of the topological mapping of the federation and the capability to route and converge information through the federation to complete the assigned tasks

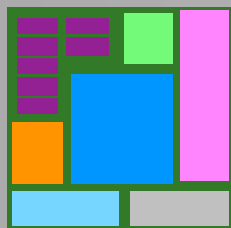
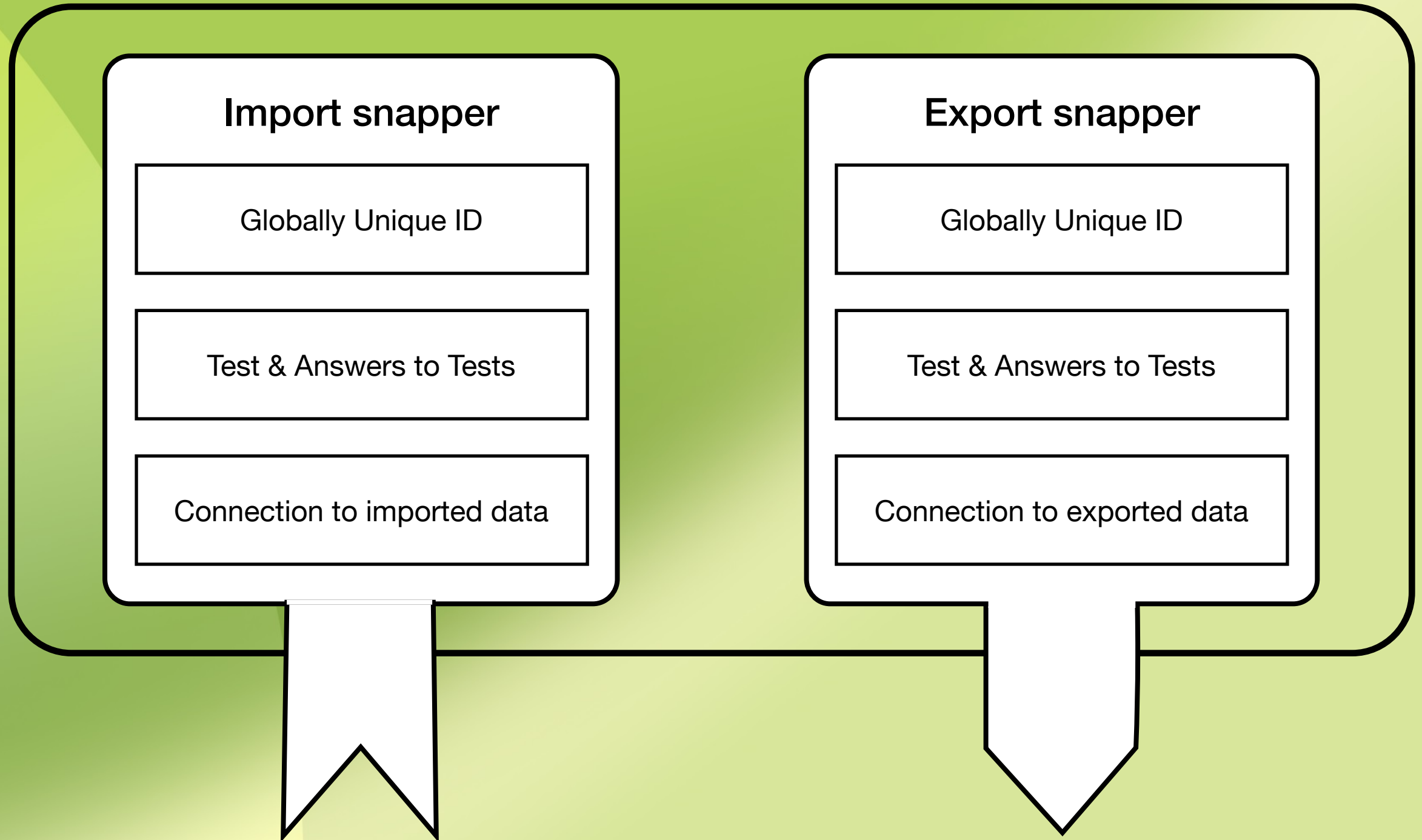




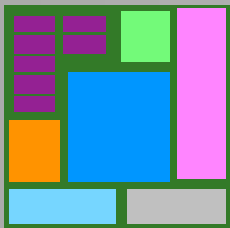
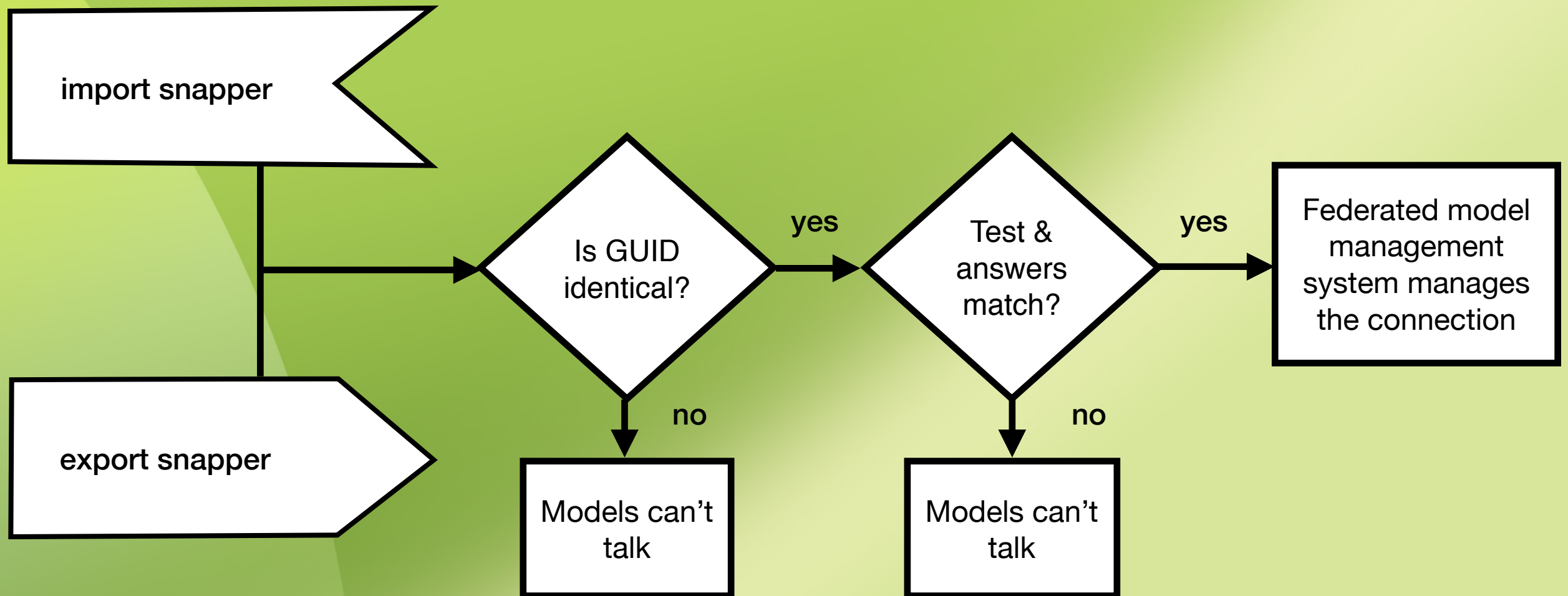
Components and information flow



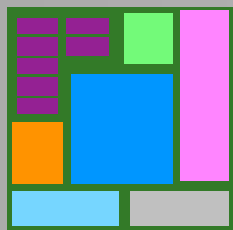
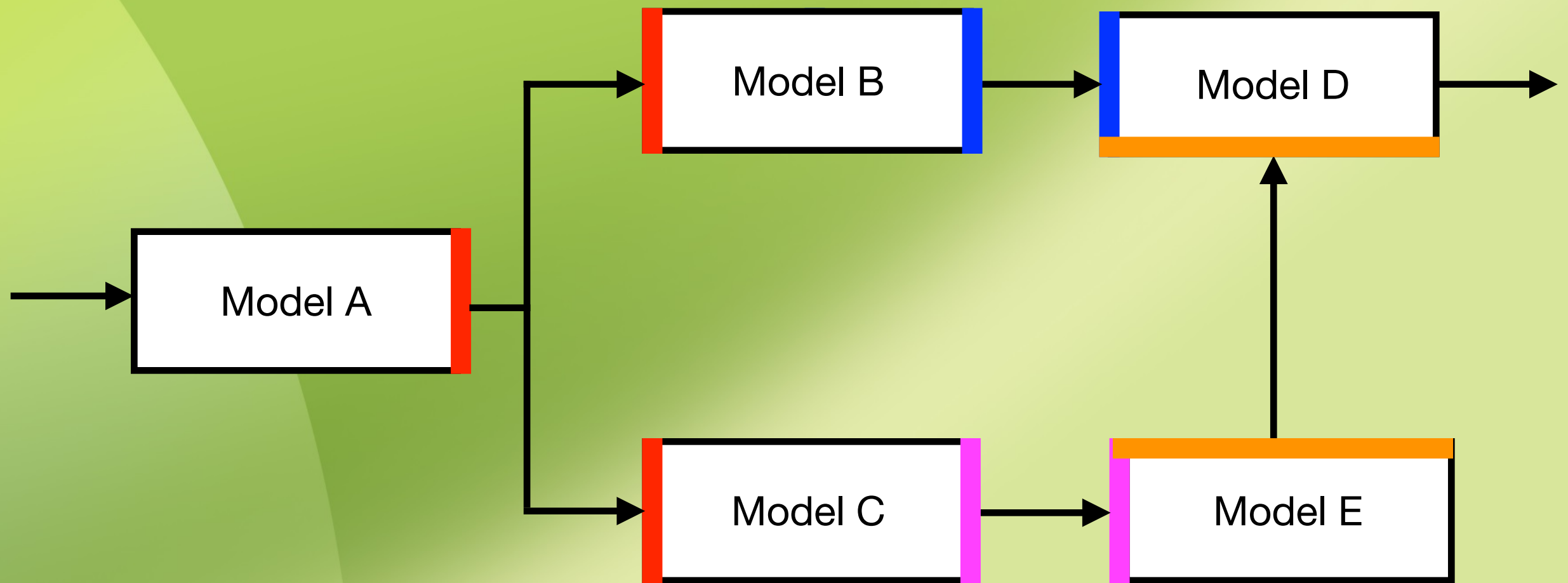
Peer-to-peer ontology



Structure of a component model

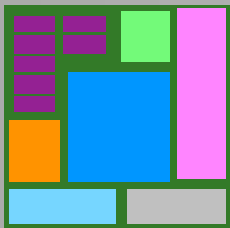


Connection process



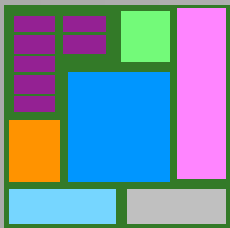
Connection process

- Games
- The app store



Two challenges

- “Accurately” simulate/model the virtual world
- Interactive decision tools
- Realtime player communication and decision making
- Easily understood graphical interface



GET STUFF DONE



Stay on Task

Sort By: **Featured**



Wunderlist - To-Do...
Productivity
★★★★★ 2499 Ratings
FREE



2Do
Productivity
★★★★★ 136 Ratings
\$39.99



Clear
Productivity
★★★★★ 219 Ratings
\$9.99



OmniFocus
Productivity
★★★★★ 30 Ratings
\$79.99



Things
Productivity
★★★★★ 17 Ratings
\$49.99



Todo
Productivity
★★★★★ 22 Ratings
\$14.99



The Hit List
Productivity
\$49.99



Producteev by Jive ...
Productivity
★★★★★ 11 Ratings
FREE



Firetask - Project-...
Productivity
\$39.99



Todoist: To Do List...
Productivity
★★★★★ 10 Ratings
FREE



TaskPaper
Productivity
★★★★★ 59 Ratings
\$9.99

Take Notes

Sort By: **Featured**



Evernote



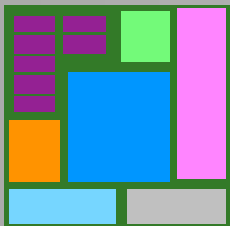
Microsoft OneNote



NoteSuite - Notes ...



MindNode Pro

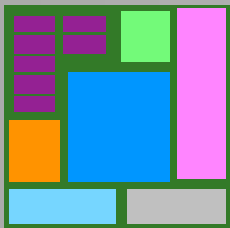


The app store

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Contact info