



arKItect graphical DSL workbench Langdev 2024

Andrew Samokish, asam@lmf.cnrs.fr

Samuel Boutin, sbo@k-inside.com

contact@k-inside.com

www.k-inside.com



KnowledgeInside
arKItect your system





Knowledge Inside SAS and arKItect

Activity

French Editor of arKItect, a General Purpose Graphical Modeler and applications since 2006

Mission

Provide a « Google Map » like approach for browsing, structuring, editing, using information (top-down & bottom up)

Vision

All Systems around us are hierachical with interactions. Information shall be formalized, organized, presented and edited the same way.



arKItect based Solutions

arKItect for 3SE

Enterprise architecture and MBSE for small teams.



arKItect SEA

Adanced Model Based Systems Engineering (MBSE)



S'KISS

Upstream design for building and infrastructure



Fast & Studios

Planning projects and portfolios



arKItect designer

General purpose graphical modeler

The mother of all arKItect applications



arKItect theory

Basic concepts of meta model:

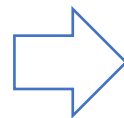
- Types or classes - with extensible record of attributes
- Hierarchical relations (which can be message or not) is first class citizen
- Heavy use of recursivity on hierarchical structures – especially for generative viewpoints

Theoretical basis

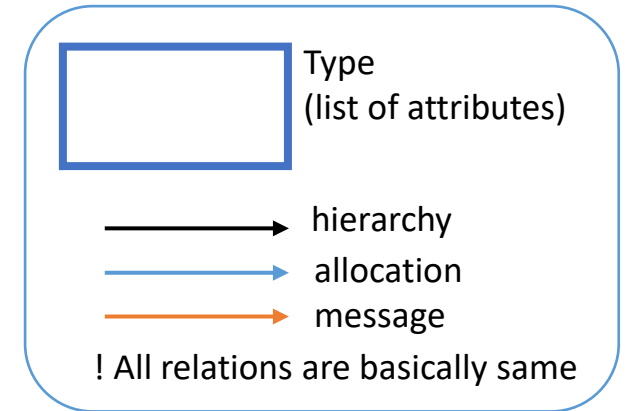
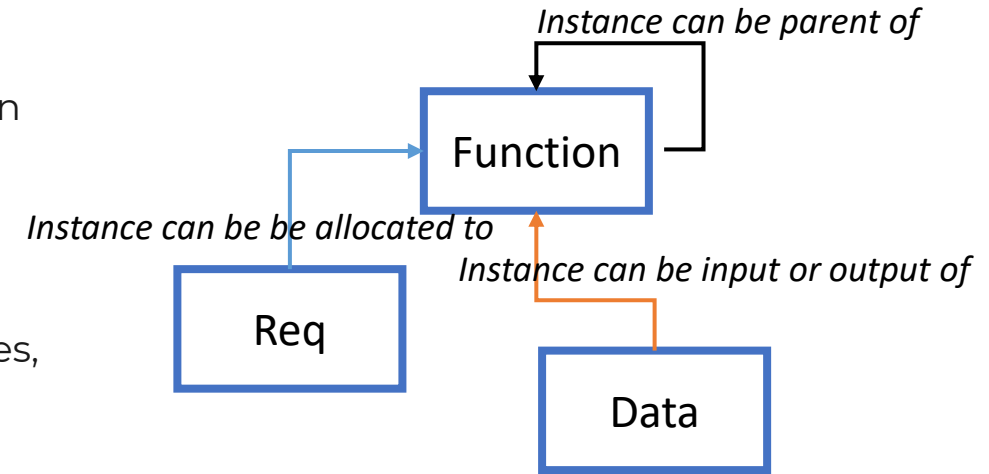
- Type systems are equivalent to Finite State Machines (FSM) + properties,
- Models are (Directed Acyclic Graphs) DAGs « consistent » with related Type system (meta model)
- Shallowing or embedding in Coq proof system can be performed (on going thesis)

Different from OO approaches:

- No relations (except hierarchy/messages)
- No arity
- No specialization/generalization
- No subtyping – just copy set of attributes



Minimal set of rules
 Very robust and stable core
 Low code
 Recursion on DAGs!





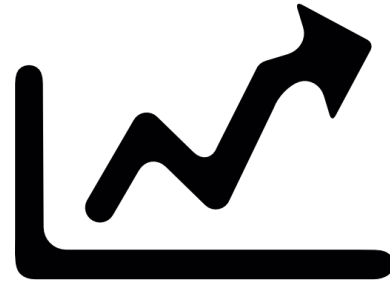
Typical User Context



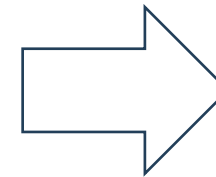
Existing internal tools
Excel based and focused on
specific tasks



Pressure on skilled
resources



More and more projects
Innovation
Technology Breakthrough
Process improvement



**Need for
Collaborative
Data centric approach**
With fast learning curve

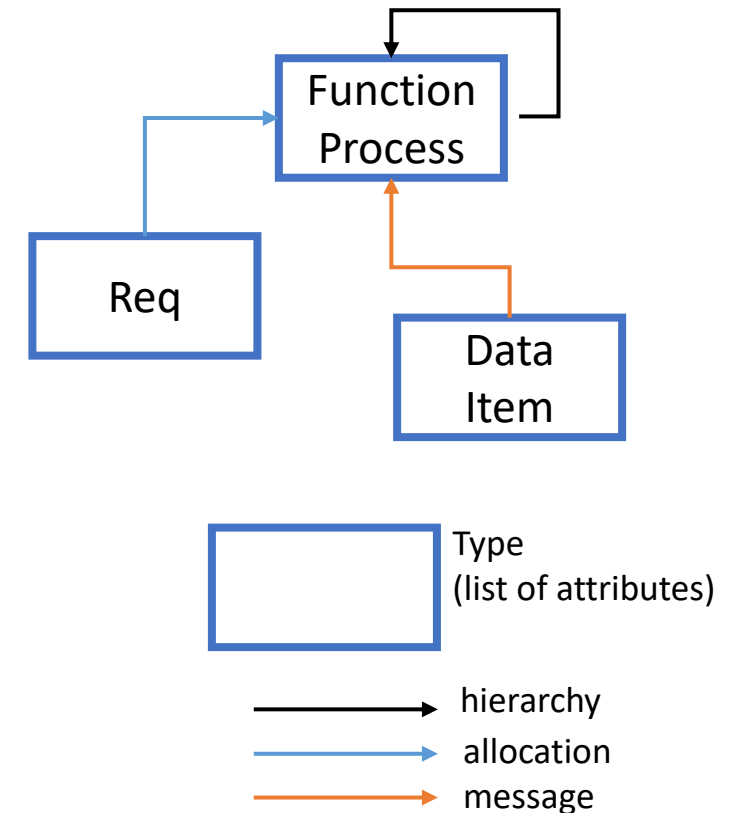


Many unrelated documents
managed by silos
Communication and efficiency
problems



Demo

- Edit process architecture Meta-Model
- Build viewpoints
- Edit a small architecture
- Feature Excel interface
- Feature flows versus ports
- Baseline
 - Functional chains
 - Configuration management
 - Doc génération



Demo

- Edit process arch
- Build viewpoints
- Edit a small arch
- Feature Excel int
- Feature flows ve
- Baseline

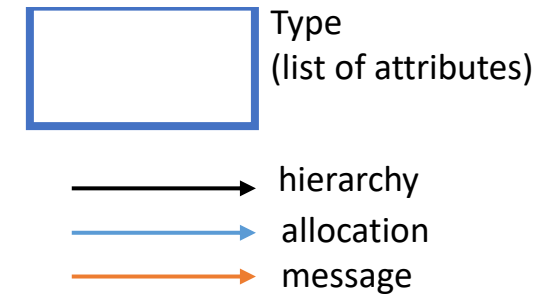
- Functional chains
- Configuration management
- Doc génération

FSM Spreadsheet

Export to Excel Export to Word External Export Settings Document history Configuration Management

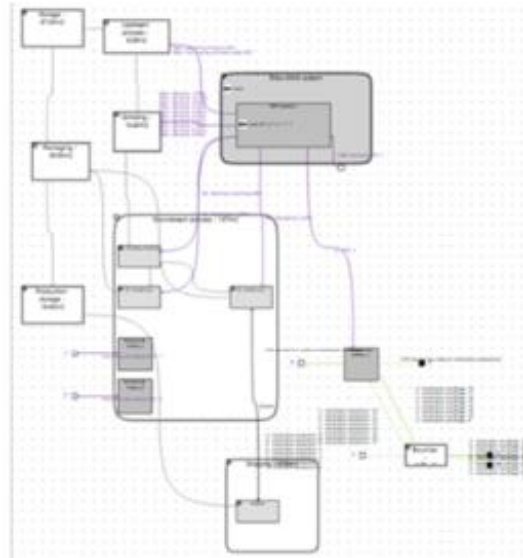
Search:

Name	Type	Revision	Description	Allocated to
Chain site	Scope	*		
Site ref COCOA	Site	*		
Aluminium Foil storage Process rate	Requirement	*	TBD	Aluminium Foil storage(Process)
Cardboard storage Process rate	Requirement	*	TBD	Cardboard storage(Process)
Carts storage Process rate	Requirement	*	TBD	Carts storage(Process)
Cleaned beans storage Process rate	Requirement	*	Consumption 1200kg per day vuu	Cleaned beans storage(Process)
DC Grinding Conching Process rate	Requirement	*	200 kg/h	DC_Grinding_Conching(Process)\n\nChain require...
DC Tempering_1 Process rate	Requirement	*	125kg/hour	DC_Tempering_1(Process)
DC Tempering_2 Process rate	Requirement	*	75 kg/hour	DC_Tempering_2(Process)
Main Grinding_1 solution attribute constraint	Requirement	1.0*	120kg/day	Main_Grinding_1(Process)
Main Grinding_10 solution attribute constraint	Requirement	1.0*	120kg/day	Main_Grinding_10(Process)
Main Grinding_2 solution attribute constraint	Requirement	1.0*	120kg/day	Main_Grinding_2(Process)
Main Grinding_3 solution attribute constraint	Requirement	1.0*	120kg/day	Main_Grinding_3(Process)
Main Grinding_4 solution attribute constraint	Requirement	1.0*	120kg/day	Main_Grinding_4(Process)
Main Grinding_5 solution attribute constraint	Requirement	1.0*	120kg/day	Main_Grinding_5(Process)
Main Grinding_6 solution attribute constraint	Requirement	1.0*	120kg/day	Main_Grinding_6(Process)
Main Grinding_7 solution attribute constraint	Requirement	1.0*	120kg/day	Main_Grinding_7(Process)
Main Grinding_8 solution attribute constraint	Requirement	1.0*	120kg/day	Main_Grinding_8(Process)
Main Grinding_9 solution attribute constraint	Requirement	1.0*	120kg/day	Main_Grinding_9(Process)
Main Roasting of beans Process rate	Requirement	*	100 kg every 30 minutes	Aluminium Foil storage(Process)\n\nMain_Roasting...
Main Winnowing and Nibs sorter Process rate	Requirement	*	200 kg/h	Main_Winnowing and Nibs sorter(Process)
Packaging Process rate	Requirement	*	200kg/hour	Packaging(Process)
shipping Process rate	Requirement	*	4200kg every three days	shipping(Process)
Store dark chocolate production Process rate	Requirement	*	200kg/hour	Store dark chocolate production(Process)
Sugar storage Process rate	Requirement	*	crystal sugar Consumption 200 kg/day	Sugar storage(Process)
Wrapping Process rate	Requirement	*	200kg/hour	Wrapping(Process)

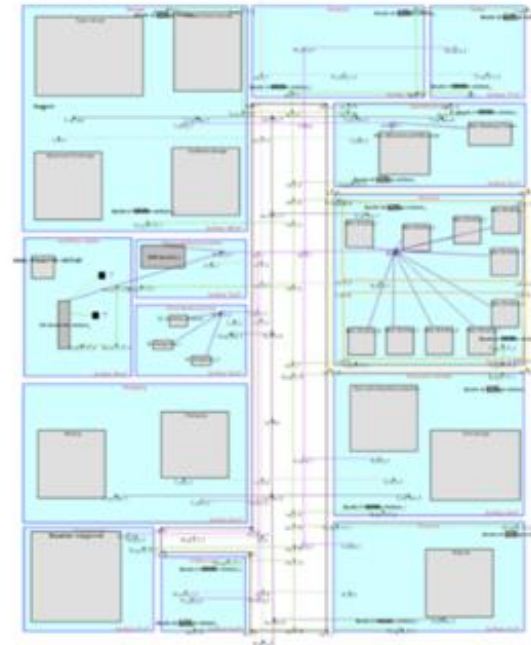




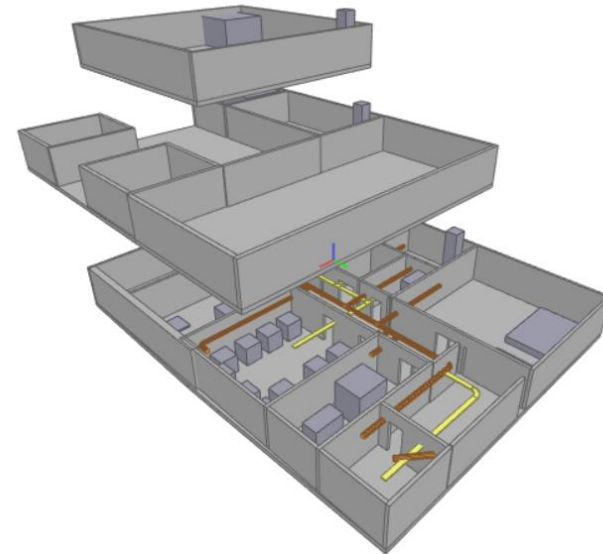
2D views and application for upstream design in construction



Vue logique fonctionnelle

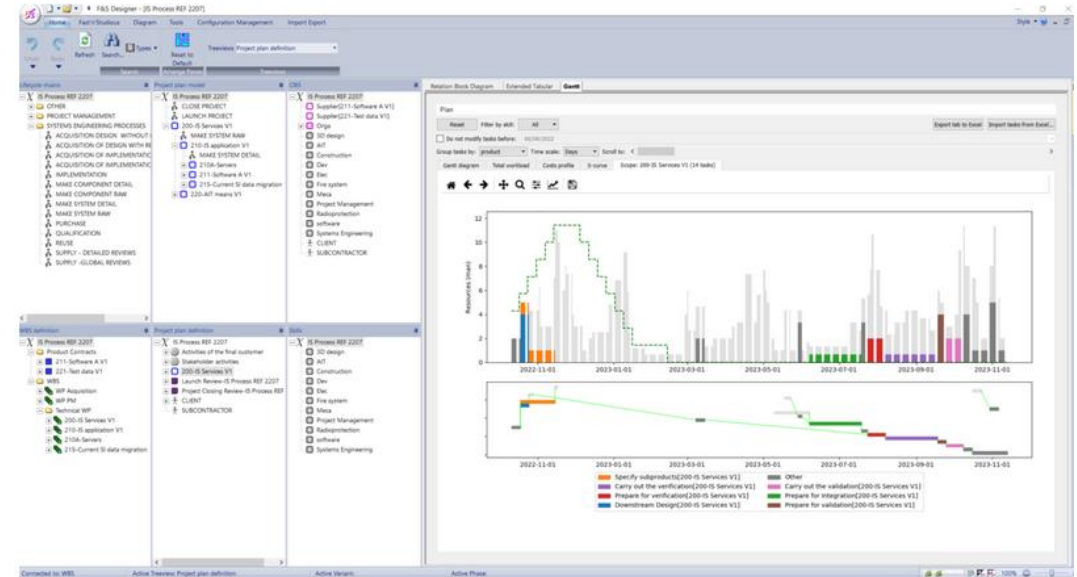
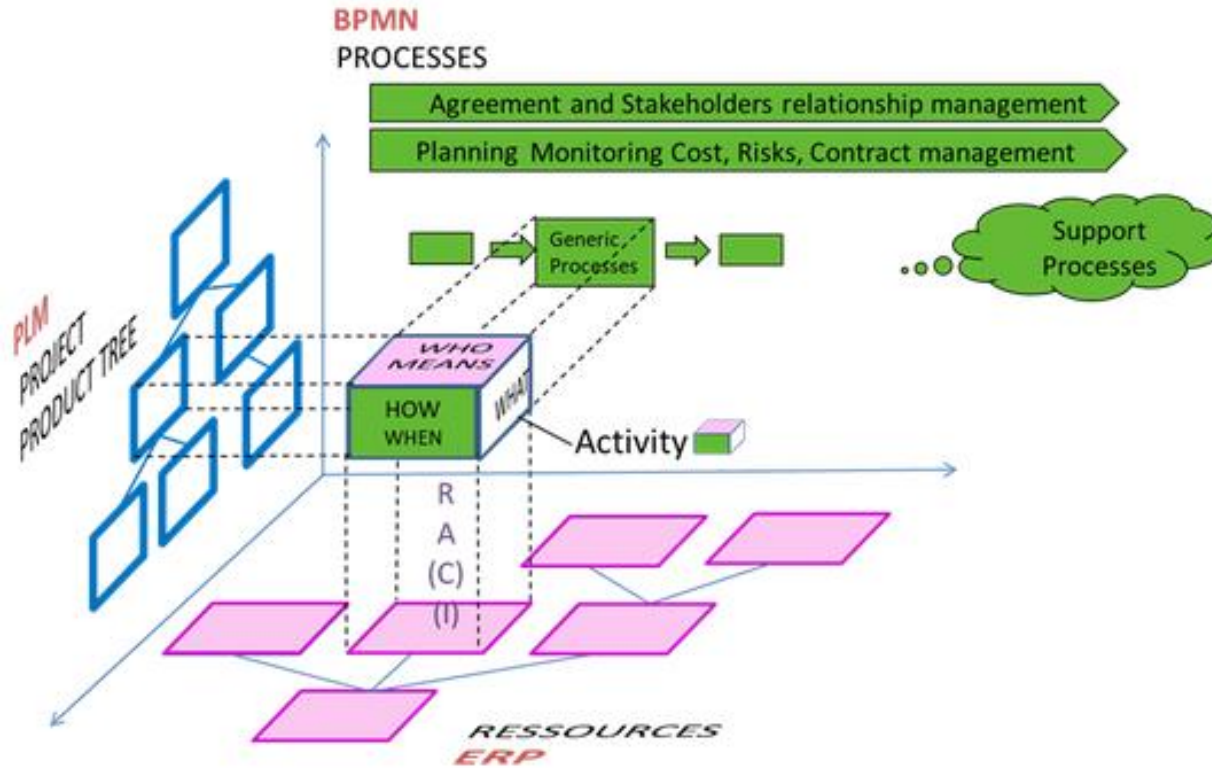


Vue 2D implantation

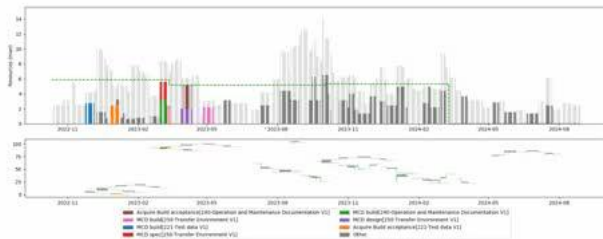
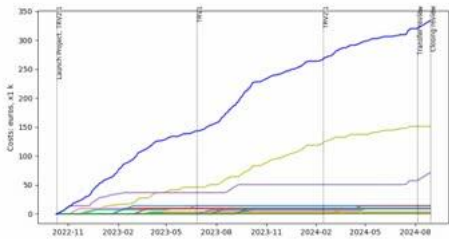




Application to project planning



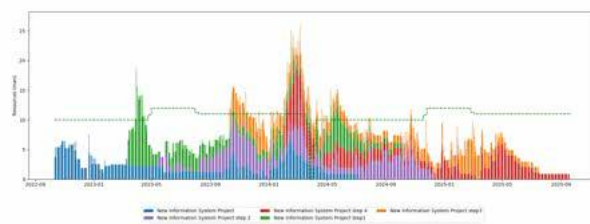
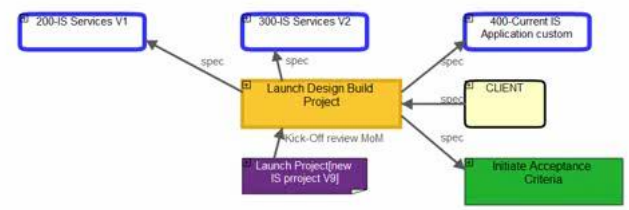
Automate project planning from 3D model informations



Fast & Studious
Smart Plan based on Processes

Project plan with Fast&Studious + ChatGpt4o

Supported by **Bourse French Tech** **bpi**france



	KOR	DR	TR	KOR	DR	TR	PROD_01-18	PROD_01-19	PROD_01-20	PROD_01-21	PROD_01-22	PROD_01-23
200-IS Services V1 [[PROD_0108]]												
200-IS Services V1-KOR	X			X								
200-IS Services V1-DR		X										
200-IS Services V1-TR			X									
210-IS application V1-KOR		X		X		X						
210-IS application V1-DR			X		X							
210-IS application V1-TR				X								
221-Test data V1							X	X				
222-IS Integration Environment V1					X				X			
223-Validation Environment V1						X			X	X	X	
230-User Training V1		X		X					X	X	X	
240-Operation and Maintenance Documentation V1		X										
250-Transfer Environment V1	X											

Samuel Boutin
mob: +33 6 22 72 10 95
sbo@fastandstudious.com
<https://fastandstudious.com/>



THANK YOU

arKItect modeler features

- Compact data models
- Generative viewpoints
- Viewpoints natively consistent
- Top-down and Bottom-up
- Functional Chains
- Metamodel dynamic update
- Revision management
- 2D views / logical views
- Options/Variants management
- Collaborative – multi-users
- Low-code
- Full python API

