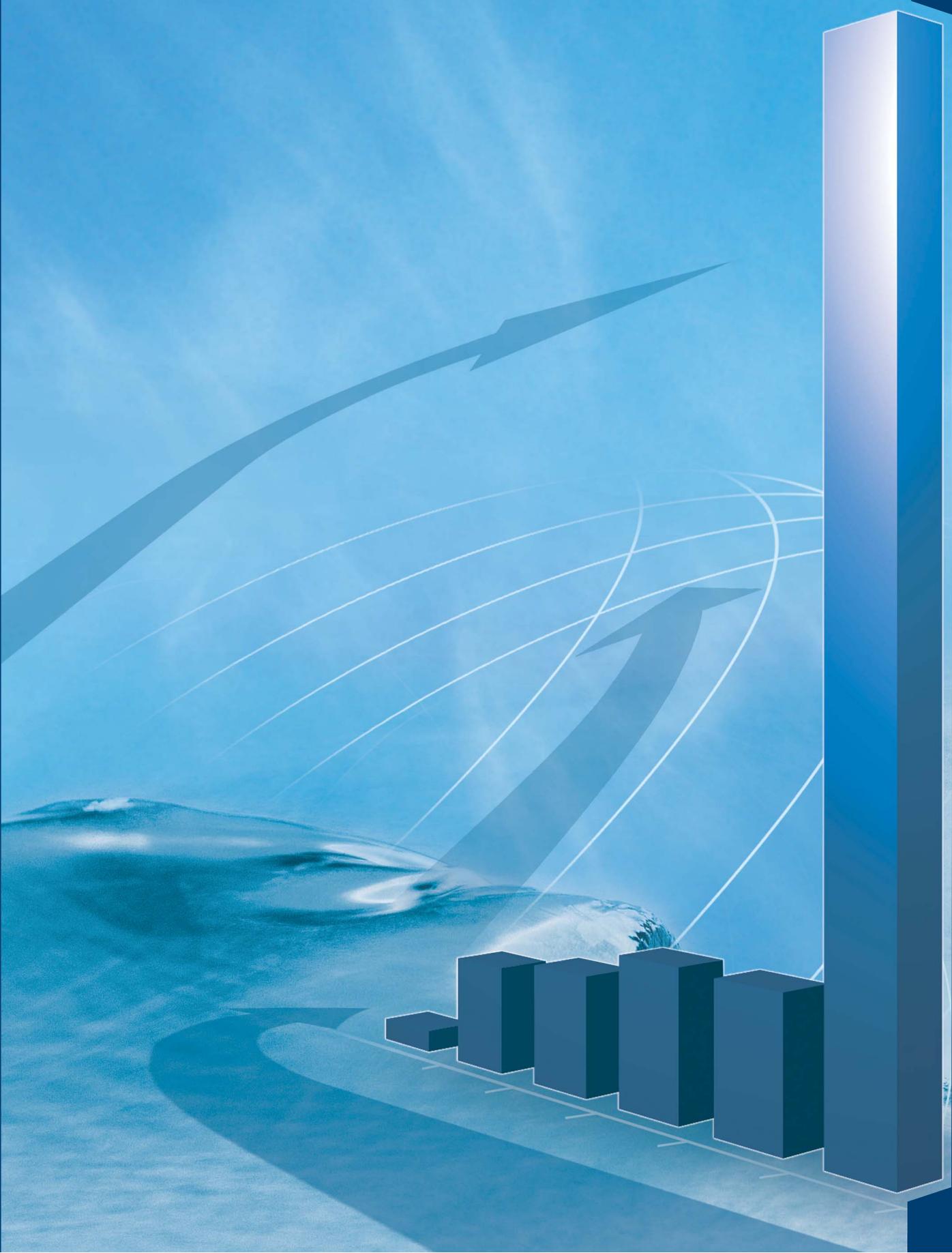




MetaEdit+[®]

Make the Productivity Leap





Getting Your Products Out Faster

A Brief History of Developer Productivity

Raising the abstraction of programming languages has been the key to improving productivity. The largest productivity boost software developers have seen was the step from Assembler to third-generation languages decades ago. Since then newer programming languages have had little impact on productivity, as they have not significantly raised the level of abstraction. Today, the productivity of your development team will not significantly improve by changing programming languages.

Current Modeling Practices Have Not Helped

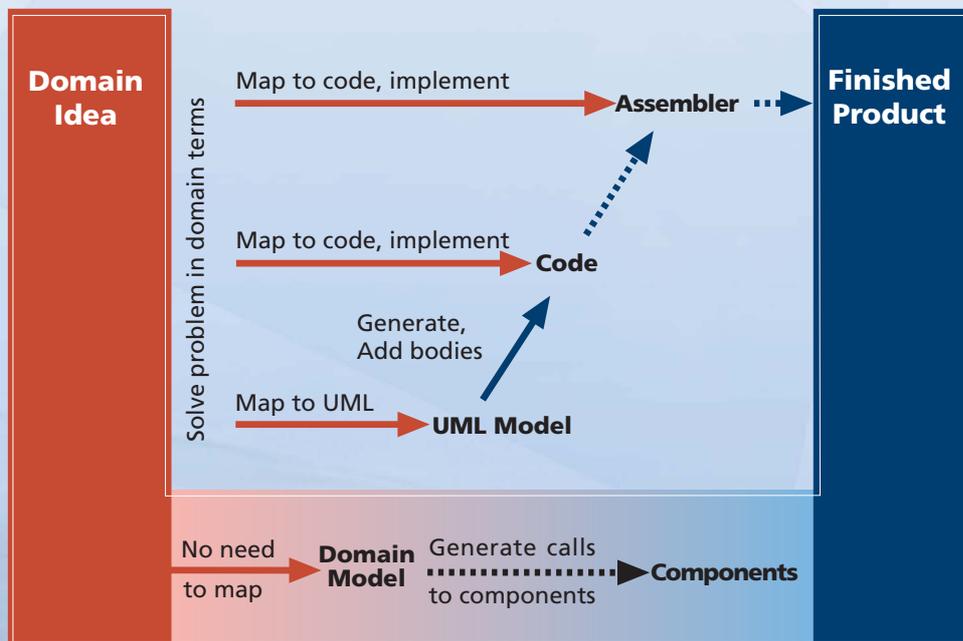
Standard modeling languages like UML have not significantly changed the situation, since the core models are at substantially the same level of abstraction as the programming languages supported: they serve as a visual representation or a blueprint of the code. The benefits of visual modeling are offset by the resources used in keeping all models and code synchronized with only semi-automatic support. Only a small part of the total code can be generated from the static models. The rest of the design - user view, dynamics, behavior, interaction etc. - and code needs to be maintained manually.

Domain-Specific Modeling is the Next Leap

Domain-Specific Modeling continues in raising the level of abstraction beyond coding. For a company making a range of similar products in the same domain, it is possible to automate production. Rather than having generic tools, you can have tools specifically tailored for building products in your domain.

A domain-specific modeling approach enables your development team to model products with the concepts of your domain. The final products are automatically generated from these high-level specifications with domain-specific code generators. There is no longer any need to make error-prone manual mappings from domain concepts to programming language concepts. Instead, each part of the solution is specified once – and only once – in domain terms familiar to all your developers. **Industrial experiences have consistently shown this approach to be 5 to 10 times faster than current practices.**

:: Model your features, not your code



Domain-Specific Modeling allows faster development based on models not code. A design method that fits your domain fundamentally increases the productivity of your team.



Automating Your Software Production

MetaEdit+: The Tool for Automating Production

Productivity will increase when your products are generated directly from models. To achieve this you must define the mechanism for automated software production: a modeling language to describe your products with, and a code generator to turn the models into code. MetaEdit+ is a metaCASE tool that allows your expert to design the modeling languages and generators to automate your software development.

Leverage Expert Knowledge within Your Team

Domain-specific modeling leverages your expert developer's knowledge of your products and code to make all your developers more effective. The expert defines a modeling language containing your domain concepts and rules, and specifies the mapping from models to code. Your other developers then make models with the concepts, guided by the rules, and the product code is automatically generated.

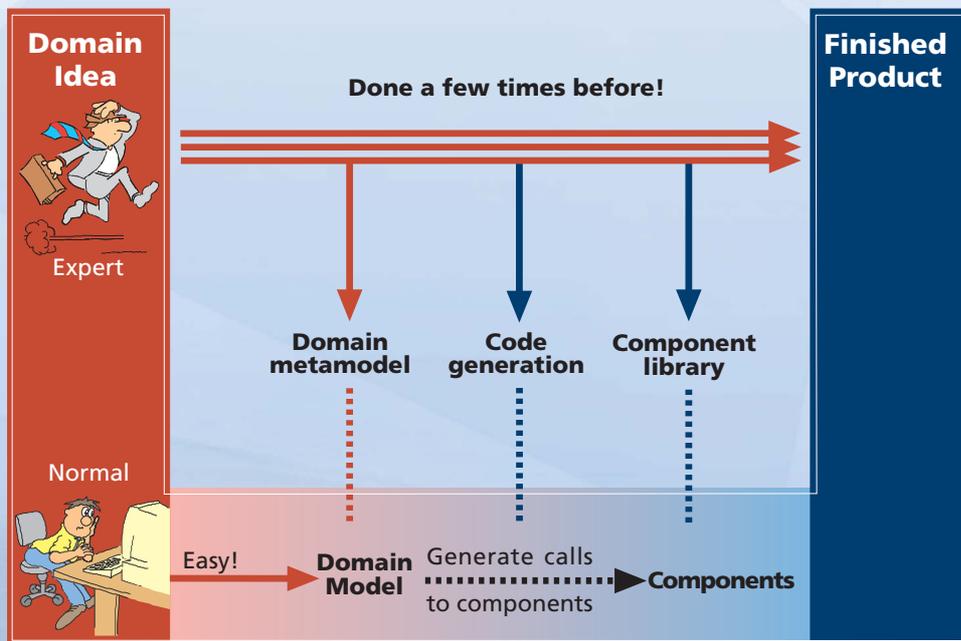
As your expert has specified the code generators, products are created faster and with better quality than your average developers could ever accomplish manually. The generated result will be free of most types of careless mistakes, syntax and logic errors. If changes are later needed throughout the code, for example to support a new platform, they can often be made in a single place in the generator by the expert. Contrast this approach with coding or standard modeling languages, where the changes need to be made in multiple places and by multiple developers.

Full Tool and Service Support

Designing and implementing a domain-specific method using MetaEdit+ is not a time-consuming process. The tools guide your expert in distilling his knowledge of the domain and code, and already provide all the functionality of a modeling tool. To maximize the efficiency of this process, MetaCase provides experienced consultants who can help your experts implement domain-specific methods in MetaEdit+.

After only a few man-weeks of work by your expert, your domain-specific modeling environment will be ready, and **you can reap the benefits of automated software production.**

:: Make all your developers experts



Your expert developer defines the domain concepts and mapping to code.

Your other developers make models with the concepts, and code is automatically generated.



Making the Productivity Leap

At MetaCase we have extensive experience in automating software development and managing the organizational change involved. Based on this experience, we have developed the following approach for best introducing domain-specific modeling into your organization.

:: Step 1 **Seeing Is Believing: Proof of Concept**

To see how domain-specific modeling works in your domain we arrange a proof of concept workshop. Together with your experts we define part of the domain-specific modeling language and code generators, and try them out in your domain. Your own experts get to see MetaEdit+ in action, and can assess the applicability of domain-specific modeling to your domain. The results of the workshop allow you to evaluate the productivity gains compared with your current practices and estimate the return on investment.

:: Step 2 **Your Expert's Input: Pilot Project**

A pilot project will be launched once the feasibility of the approach has been justified. Your experts, possibly together with our consultants, implement and apply the domain-specific language and generators in MetaEdit+. At this stage the path for a successful introduction is laid out including tool rollout, training and integration with your development process.

:: Step 3 **Reaping the Benefits: Get Your Products Out Faster**

Your expert's domain knowledge is now encapsulated into a dedicated modeling language and generators. Your developers make models using MetaEdit+ and your final products are automatically generated from these models. Your developers can now turn their focus from writing code to getting the functionality your customers want.

The key benefits of domain-specific modeling are:

- :: Productivity increases by a factor of 5-10
- :: Developers can concentrate on features not code
- :: Product quality improves significantly

Your Next Step

Contact us to arrange an evaluation kit for your expert, and a time for a workshop: **Seeing is believing.**

:: What the Press Say



Application Development Advisor

"Industrial applications of [domain-specific modeling] show remarkable improvements in productivity – up to ten times faster. It makes the product family explicit, substantially increasing the speed of variant creation."



Dr. Dobb's Journal

"Real-world experiences with domain-specific modeling have shown major improvements in productivity and time-to-market responsiveness, and a significant reduction in the number of errors."



Embedded Systems

"An upward shift in abstraction leads to a corresponding increase in productivity. Today, domain-specific visual languages provide a viable solution for continuing to raise the level of abstraction beyond coding."

:: What Our Customers Say

Mobile Phones

Nokia Mobile Phones

"MetaEdit+ was the most flexible tool, allowed us to define our own domain-specific design syntax quickly, and make fast experiments while developing the method," says David Narraway from Nokia Mobile Phones. As a result, "A module that was expected to take 2 weeks now took 1 day from the start of the design to the finished product".

E-commerce

Pecunet

"With MetaEdit+ we have fundamentally changed the way how our applications based on an e-commerce platform are developed. Traditional programming has largely disappeared and we can build systems up to five times faster with fewer errors," says Joachim Lindig from Pecunet.

Professional Mobile Radio

Nokia - Tetra Terminals

"The quality of the generated code is clearly better, simply because the modeling language was designed to fit our terminal architecture. This rules out errors, eliminating them already in the design stage," says Antti Raunio from Nokia.

The Company

MetaCase is the leading provider of domain-specific modeling environments. Since 1991, MetaCase has been enabling customers to improve their productivity and competitiveness with development methods and tools that fit their needs. Its product, MetaEdit+, has been applied in more than 30 countries and improved the productivity of thousands of developers.

MetaEdit+ has been winning awards since its first version, which was ranked as Best Application Development Software at CeBIT '95. In 2000 the President of Finland presented MetaCase with the National Prize for Innovation. Most recently in 2008 SD Times named MetaCase as one of the world's top 100 leaders.

References include:

Accenture	Nokia
Aermacchi	Pecunet
British Telecom	Portugal Telecom
Deloitte & Touche	Receptum
Digia	St. Jude Medical
Electricité de France	Società Italiana Avionica
Elektrobit	SysOpen
Fuji Xerox	Tekla
InterClean	Teleca
Italia Telecom	TeliaSonera
Logement Français	TietoEnator
Metso	Vertu
Moog	VTT
Nethawk	WTS Network



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