

HP Laboratories
Application Engineering Department

Fusion Newsletter - OOPSLA 94

Fusion - One Year On

The Fusion method was launched at OOPSLA'93 and in the intervening year progress has been quite spectacular. The book has been reprinted twice. A Japanese translation has been published, and other translations are under way.

Many Hewlett-Packard customers, other companies and universities have adopted the method. In HP, Fusion is the method of choice for most projects. Many products are being developed using Fusion; the first one went to manufacturing release in August.

Fusion Forum

HP Labs have set up fusion_forum, a listserv on the Internet. Any message mailed to fusion_forum is automatically sent to all subscribers. The forum is open to everybody interested in Fusion. Currently there are over 170 subscribers. There has been active discussion on many topics including Fusion/OMT metrics, using Fusion on real problems, CASE tools and suggested changes to notations.

To subscribe to fusion_forum, mail a message to listserv@hplsr.d.hp.com with the body:
subscribe fusion_forum <subscriber name>.

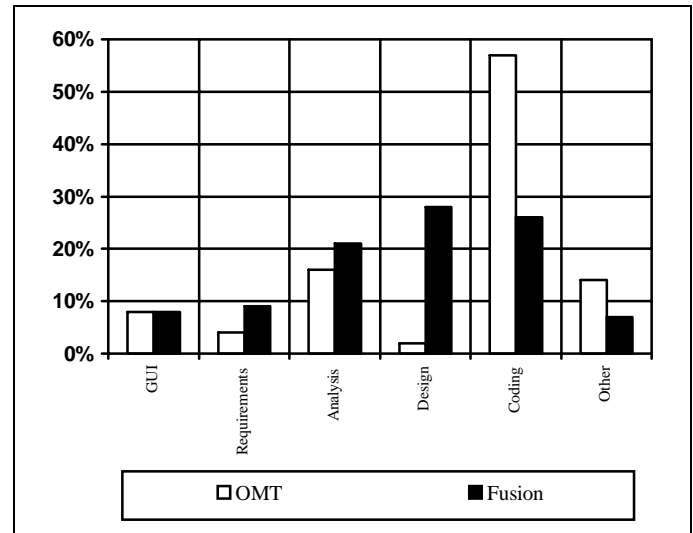
To get help on using fusion_forum just mail help to listserv@hplsr.d.hp.com.

Fusion and OMT Metrics

Kris Oosting of Shared Objectives has conducted a metrics study comparing Fusion and OMT. (Contact: koosting@pimsord.knoware.nl)

Over two years the same NEXTSTEP application was developed once using OMT and then using Fusion. Although the project teams were not completely disjoint, the first development had little or no influence on the second because of the time interval and because no software or documentation from the first project was used by the second team.

The following bar chart shows the % of overall development effort spent on each phase.



It can be seen that Fusion front-loaded the development process - because it requires more models to be developed. However using Fusion reduced the total development time by 20%. (This number was 31% if the time needed to make the same design documentation for the old system is included.)

The code from Fusion was also 30% smaller and better structured, with 12% lower McCabe complexity, 19% fewer methods and 87% fewer object references.

To quote Kris, "The New System: - Used 20% LESS time to develop it!! (saves money) - Much easier to Maintain (saves money and irritation later !) - Has Better OO Design and Structure - easier to use (customers react better)"

Fusion in and around HP

The use of Fusion within HP has grown dramatically in the last year. Development teams have found that Fusion provides value in a broad range of products and development phases. Here are some highlights from those projects:

Network Protocol Driver: First release shipping to customers, second release well underway. The artifacts from the Fusion process have helped accelerate the progress on the second release. The third release is already in the planning stage.

Embedded Real-time Instrument Firmware: Project is well into the implementation phase. Early concerns about performance with an OO platform built for multiple-project reuse were

eliminated by using an evolutionary development approach. A vertical slice of the architecture was implemented for early performance characterization, and the architecture met expectations with only minor adjustments.

Output Device Driver: Implementation is nearing completion. The key classes and sub-systems will be extracted to build a platform for parallel development of next generation device drivers.

Distributed Product Management System: This team has found the analysis models of Fusion very helpful in refining and completing the external specification / user needs phase of their project.

More recently projects have been launched to build products in the areas of network management, health management, and video management.

Visio Fusion Templates Available On-Line

The Visio Fusion templates are a low-cost drawing aid to help you efficiently create and edit your Fusion models. These templates have been in use around HP for the last couple of years, and they have recently been enhanced to take advantage of the new features available in Visio 3.0.

Shapeware Corporation's Visio is a low cost drawing tool for Windows that features a drag-and-drop stencil paradigm to create diagrams. Each item in a stencil can include a significant amount of "intelligence" that defines its behavior. One example of this intelligence is connecting lines between items in a diagram that readjust as the items are repositioned.

The Fusion templates include a stencil for each of the major Fusion models. The template files are available through anonymous ftp on the secure HP server acme.hp.com (192.6.39.10). Don't forget to set the transfer mode to binary.

For Visio 2.0 templates look in: /pub/fusion/visio.2.0
For Visio 3.0 templates look in: /pub/fusion/visio.3.0

Consultancy and Training

HP Customer Education has developed a highly successful Fusion training class which has given to HP customers, large and small, world-wide. Classes are available in the training centers and on-site. In the USA call 1-800-HPCLASS, elsewhere call the nearest HP office. HP's Professional Services Organization also offers Fusion consultancy.

The HP European Knowledge Systems Centre in Bristol offers training and consultancy in Fusion. For further information contact Damian Black at dsb@hplb.hpl.hp.com.

Icon Computing is a Texas based company specializing in education and consulting services in object-oriented

technology. They offer a series of courses covering analysis, design, implementation and project management. The analysis and design courses include Fusion and other popular methods. For more information contact info@iconcomp.com.

FusionCASE from SoftCASE

FusionCASE is a tool produced by the UK based company SoftCASE. The tool is in use by a number of big companies including the Sema Group, MCI, various HP divisions and a number of smaller European companies. SoftCASE has distributors in Holland, France, Germany, and some in the USA.

FusionCASE v1.2 has just been launched and includes: new C++ code generation controls; full inheritance modeling; compound document generation ; new improved User Documentation and a Tutorial. Two more releases giving more features are scheduled for the end of the year. (Contact: fusion@softcase.co.uk).

Paradigm Plus

ProtoSoft were the first vendor to support Fusion with the release of their Paradigm Plus/Fusion tool in April 1993. Paradigm Plus supports all Fusion models and associated notations. A BASIC scripting language allows for the implementation of Fusion's consistency checking. Customized scripts help automate transitions between models with the automatic generation of diagrams and suggestions for entity decompositions. (Contact: +1 (713) 480 7233).

Other Tools

Mark V has a Fusion tool based on ObjectMaker (Contact: fusion@markv.com). Currently other vendors are known to be actively considering supporting Fusion.

Tool Evaluation

Wan Chang of HP, (wanc@dtc.hp.com), is conducting an evaluation of the Fusion tools against a set of practical criteria. The criteria include ease of use, inter-method translation, support for design reuse, traceability analysis, code generation and customizability. The report will be available later in the year and will be posted on fusion forum.

References

Object-Oriented Development: the Fusion Method, D Coleman, P Arnold, S Bodoff, C Dollin, H Gilchrist, F Hayes and P Jeremaes, Prentice-Hall Inc, ISBN 0-13-338823-9.

The Japanese translation by Osamu Igarashi, Naoki Ueno, Kiichi Obata, Hideyuki Hayashi and Susumu Majima is published by Prentice-Hall/Toppan, ISBN 4-8101-857-7.