

PANEL: Designing Reusable Designs — Experiences Designing Object-Oriented Frameworks

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An object-oriented framework provides a skeleton for implementing an application or application subsystem in some problem domain. A framework is typically composed of a mixture of concrete and abstract classes along with a model of interaction among the classes. A framework is used by configuring or connecting the predefined concrete classes and by deriving new concrete classes from the abstract classes. Normally, the model of interaction and control flow among the classes is not modified when using a framework.

Frameworks were first recognized in the context of user interface construction with systems such as Smalltalk-80's Model/View/Controller. Later systems such as MacApp expanded their functionality to become frameworks for complete, generic applications. More recently, the framework concept has been applied to specific application or operating system domains.

Because the basic set of classes and their models of interaction are shared by all users of a framework, it is appropriate to think of a framework as a reusable design. Designing a framework is difficult because the designer must develop a solution that spans an entire problem domain and then implement that solution in an extensible and reusable manner.

The members of this panel are all designers of successful frameworks. Each panelist will describe the basic architecture of their framework and the process they used to develop the framework. The emphasis will be on identifying common design principles that contribute to the reusability of frameworks.