



Component Technology

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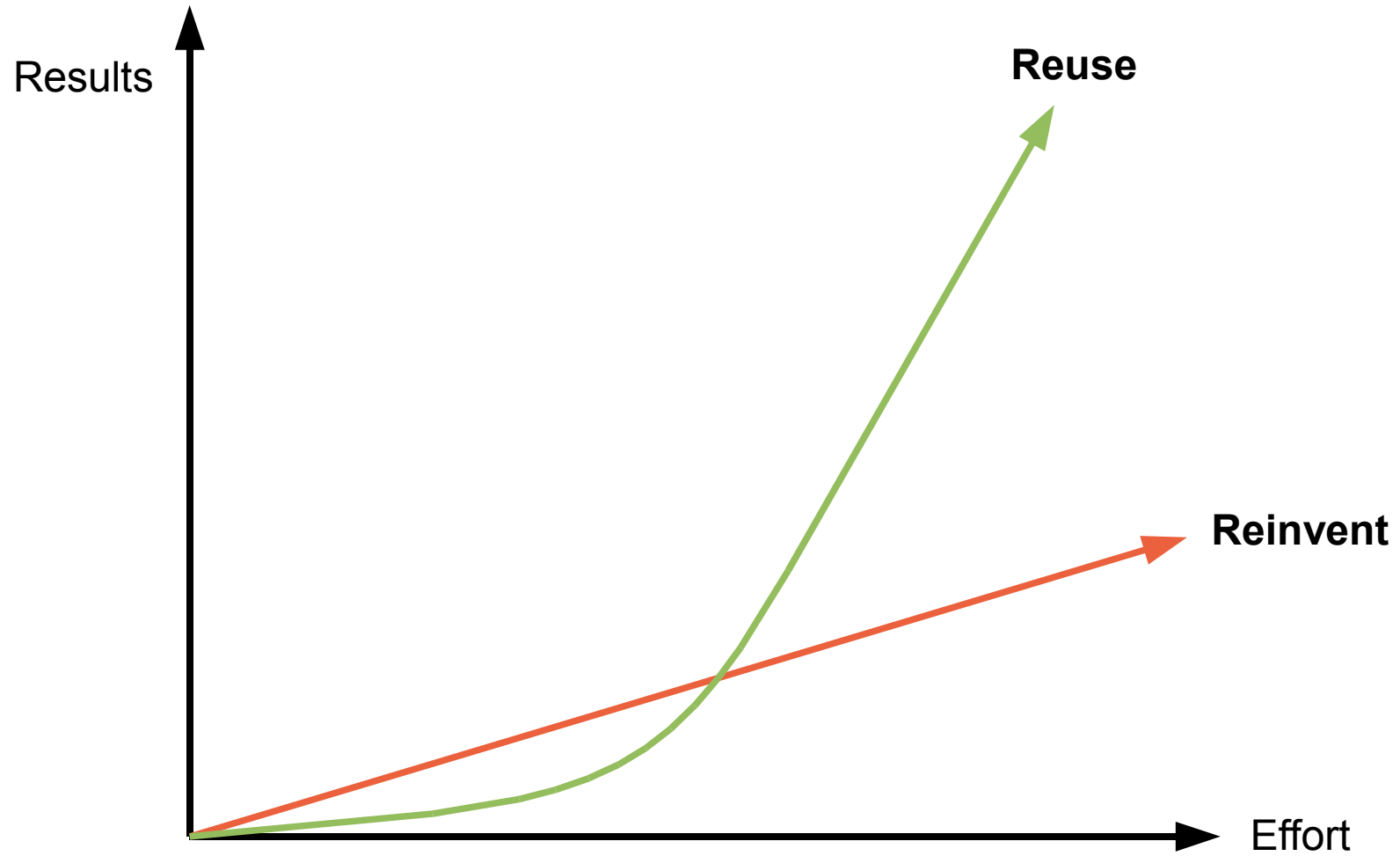
Goals

- Benefits of modular programming
- Practical experience (Eclipse and NetBeans)
- Overview of existing modular systems and techniques
- **Project**

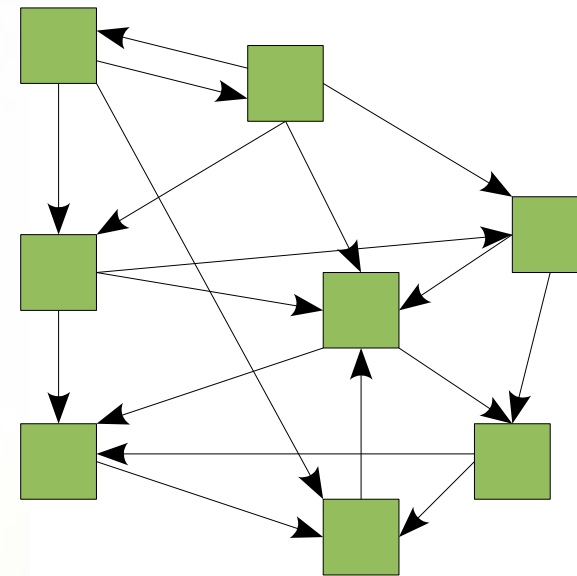
Don't reinvent the wheel!



Learning Curve

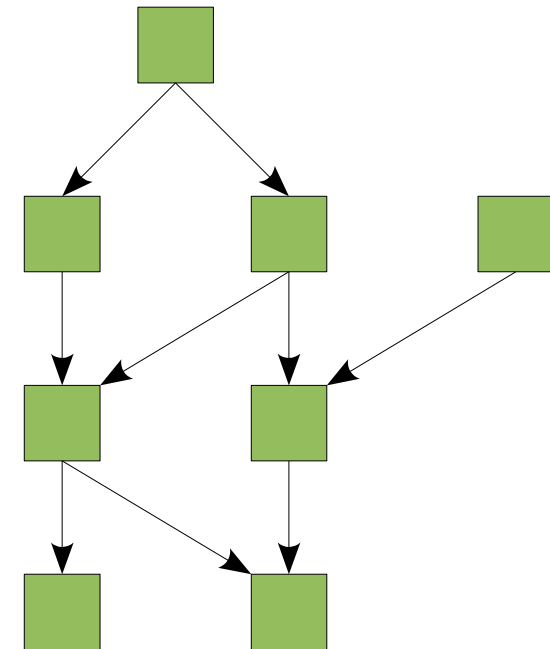


Object Oriented Spaghetti Code



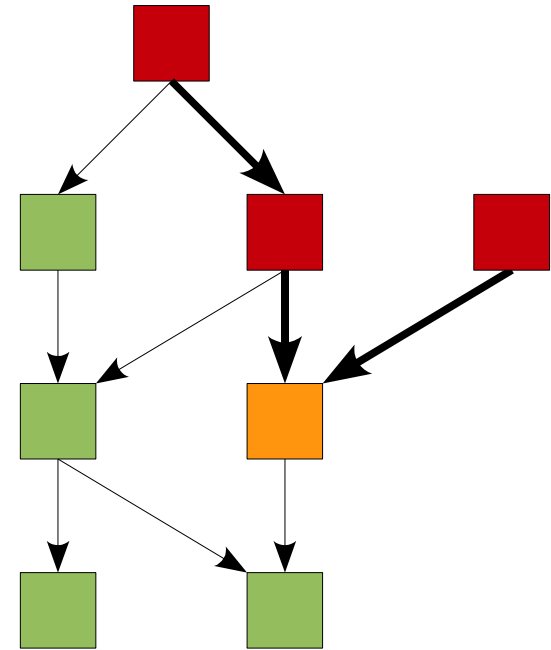
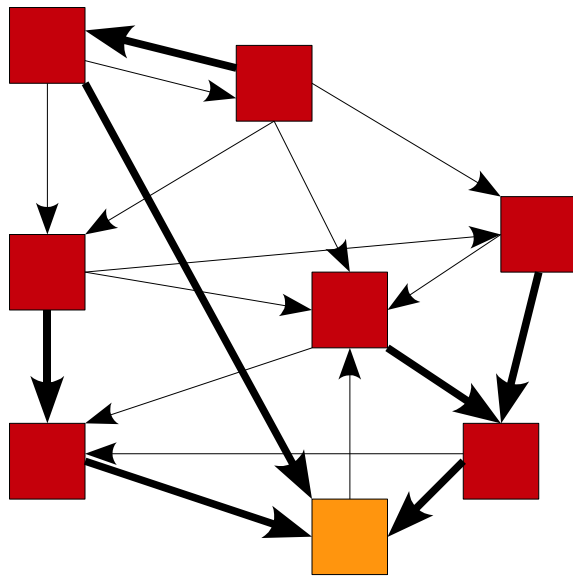
$\approx O(n^2)$ dependencies

Module System

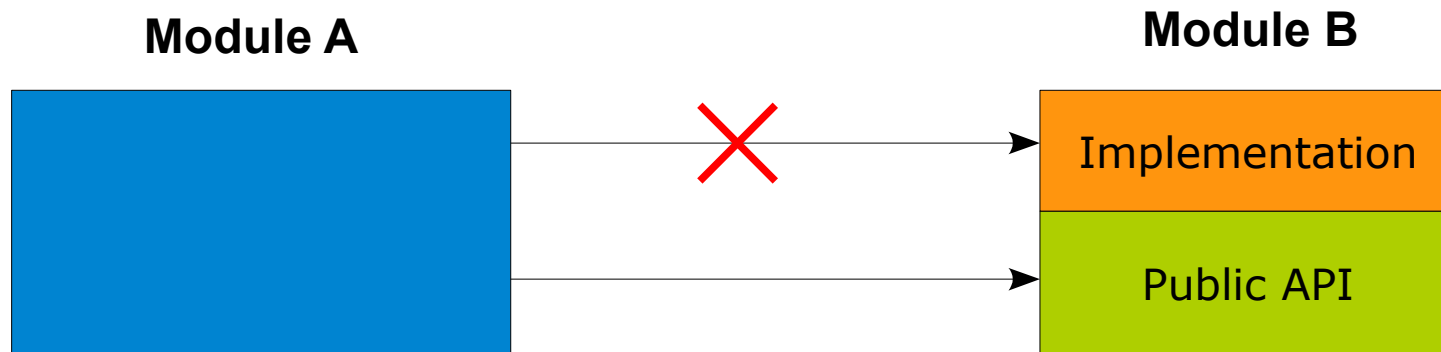


$\approx O(n)$ dependencies

Tracking impacts



Information Hiding

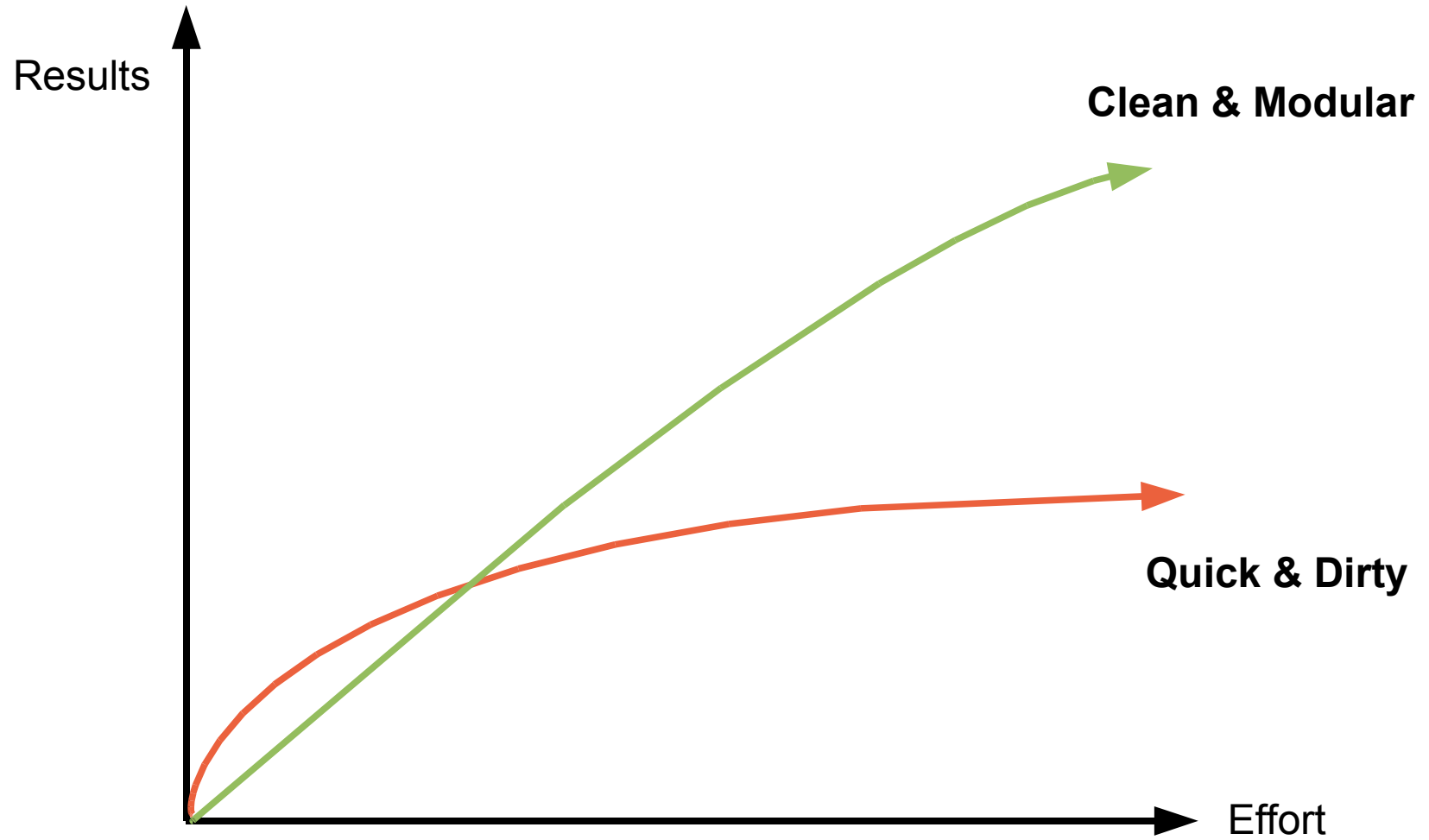


Limits are your friend!

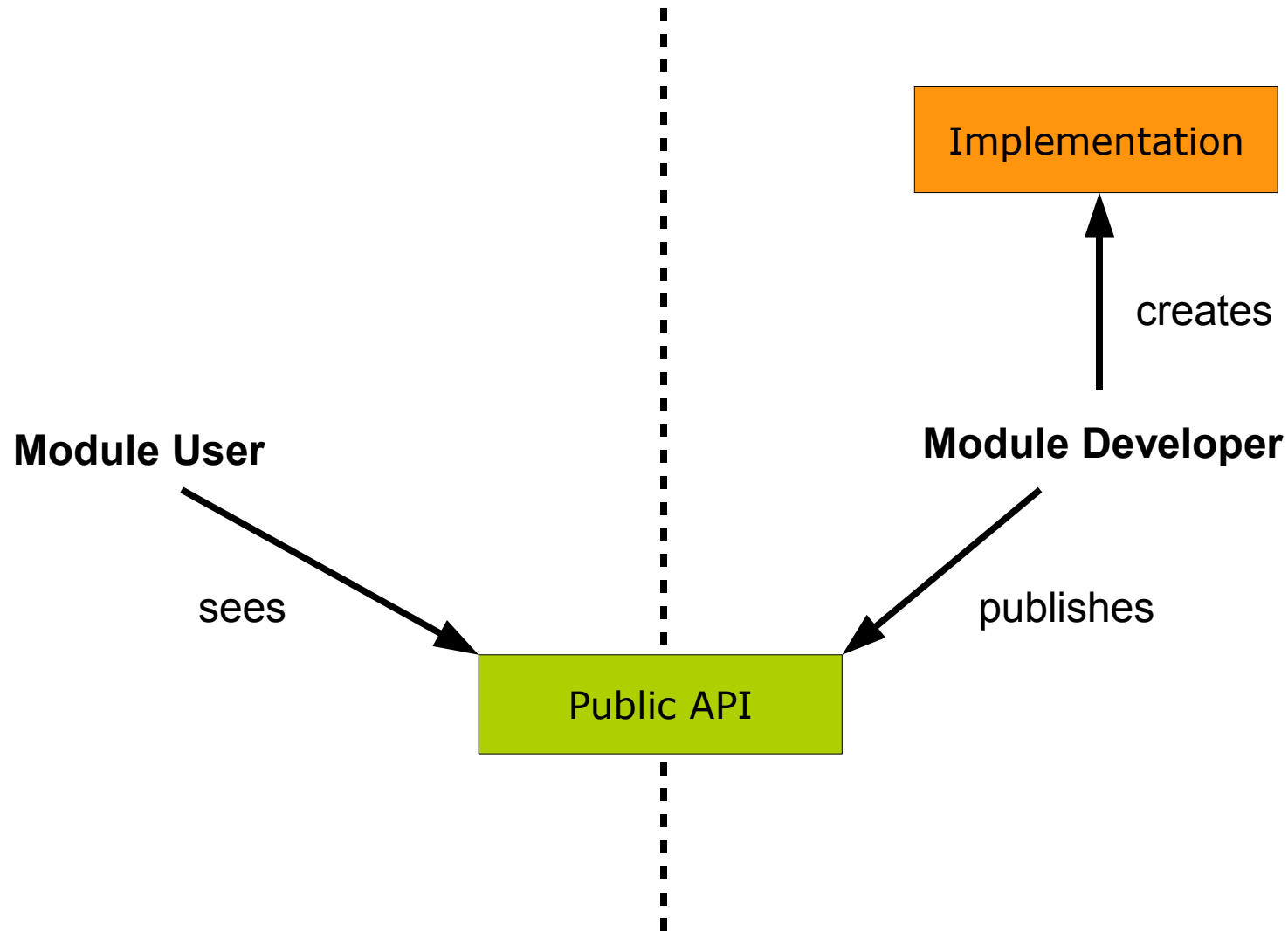
Restrict dependencies

Small public API

Clean Structure



Distributed Development



Mechanisms in Java

Access modifiers only at class level -

Custom class loaders!

JDK7: New **module** keyword

GOTO vs IF, WHILE, ...

=

unrestricted OOP vs modular programming

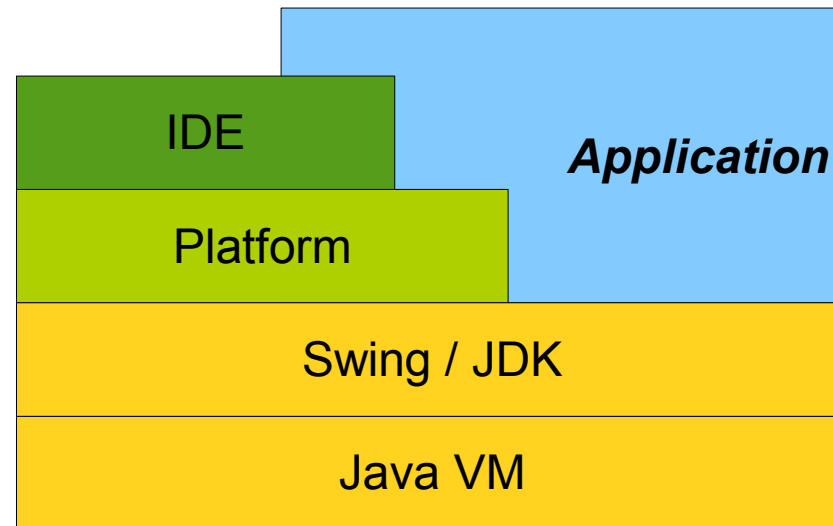
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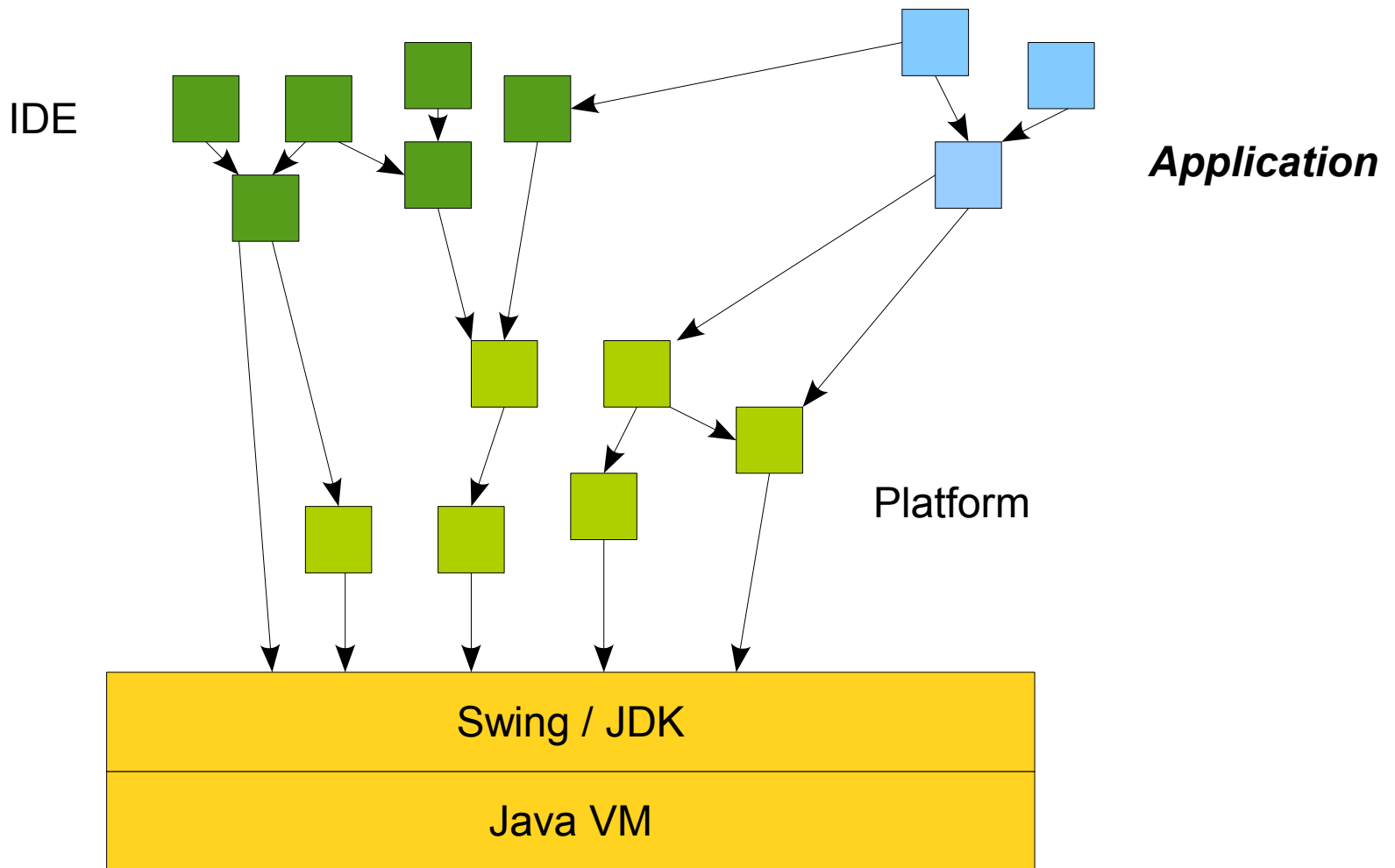
NetBeans vs Eclipse



Architecture Eclipse/NetBeans

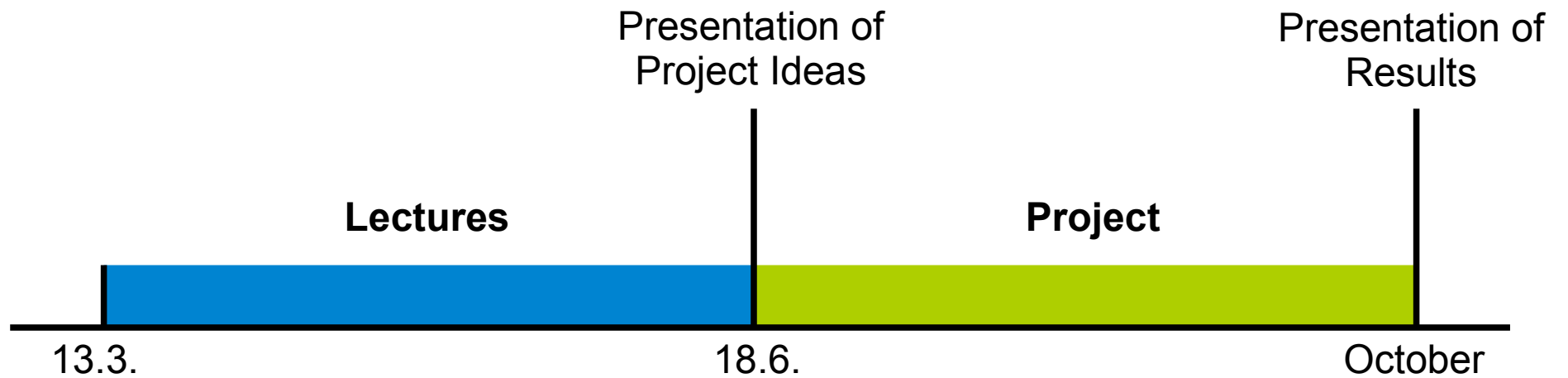


Detailed Architecture



- **Standalone:** Deployment including required platform / IDE modules
- **Plugin:** Deployment only with user-defined modules

Timeline



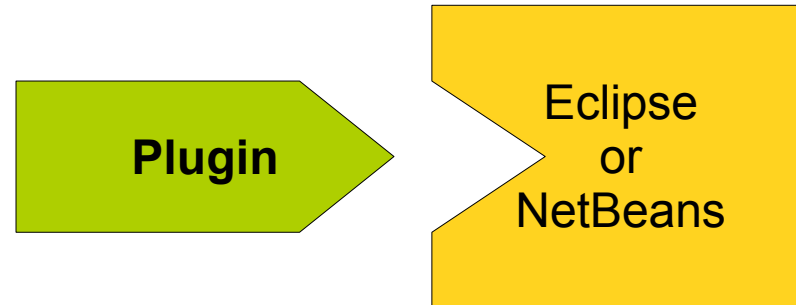
Lecture

- **OSGi**
- **Eclipse**
- **Netbeans**
- **Other component-oriented systems:** Mozilla, Visual Studio, IntelliJ,
Plux.NET
- **API Design**

Recommended Books

- Practical API Design: Confessions of a Java Framework Architect
(Jaroslav Tulach)
- Contributing to Eclipse: Principles, Patterns, and Plug-Ins: Principles,
Patterns and Plugins
(Erich Gamma, Kent Beck)
- Rich Client Programming, Plugging into the Netbeans™ Platform
(Tim Boudreau, Jaroslav Tulach, Geertjan Wielenga)

Project



Teams of 2+

Binary and documentation on website

Image Sources

"Stone Wheel" - <http://www.flickr.com/photos/bbalaji/2443820505/>

"Spaghetti" - <http://www.freedigitalphotos.net/>

"Module System" - <http://www.freedigitalphotos.net/>

"Sensor box done!" - <http://www.flickr.com/photos/amagill/2404453405/>

"Solar Eclipse 1" - <http://www.flickr.com/photos/aseph/3227962585/>