**SWIG EXCEL EXTENSION**

**Senior Project 2007**
Team Swiggles · Beekey Cheung, Scott Flynn, Michael Ho, David Osolkowski, Steven Schutzman
Team Advisor · Professor Mark Ardis
Project Sponsor · JPMorgan

> **Motivation**

JPMorgan uses Microsoft Excel to prototype financial models. They also have C/C++ libraries that contain more complex financial calculations. JPMorgan wants to be able to use these libraries in their Excel prototypes. Currently they must manually modify the C/C++ source to conform to the Excel API, which is very time consuming. JPMorgan would like this process to be automated using SWIG.

> **Design**

SWIG is designed to allow for new languages to be added, so much of the design is constrained by the already existing architecture. However, Excel has no inherent concept of objects, so special consideration must be given in order to handle C++ objects. This is done via an object repository, which matches objects used by C++ to string keys used by Excel.

> **SWIG**

SWIG (Simplified Wrapper and Interface Generator) is an open-source framework which allows C/C++ code to be called from a variety of other languages. The SWIG Excel Extension extends the functionality of SWIG to Excel.

SWIG wraps the source code into an interface which is in turn called by Excel. Objects are handled by using special IDs as an argument to the function.

> **Process Methodology**

SWIG is a large, complicated and unfamiliar piece of software. The process for extending SWIG is also very complicated. Crystal Clear helps address these concerns.
- Osmotic Communication – promotes group learning
- Frequent Delivery – evolutionary development
- Customizability – adjust methodology as necessary
- Reflective Improvement

Evolutionary development was used with emphasis on domain research.

> **Future Work**

It is hoped that the Excel Extension will be added to the official distribution of SWIG so that it can be used by anyone. This will require a formal request, extensive documentation and additional stability testing. JPMorgan would handle future maintenance if accepted into the SWIG project.