



# Building Automated Trading Systems: With an Introduction to Visual C++.NET 2005 (Financial Market Technology)

By Benjamin Van Vliet

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Over the next few years, the proprietary trading and hedge fund industries will migrate largely to automated trade selection and execution systems. Indeed, this is already happening. While several finance books provide C++ code for pricing derivatives and performing numerical calculations, none approaches the topic from a system design perspective. This book will be divided into two sections?programming techniques and automated trading system ( ATS ) technology?and teach financial system design and development from the absolute ground up using Microsoft Visual C++.NET 2005. MS Visual C++.NET 2005 has been chosen as the implementation language primarily because most trading firms and large banks have developed and continue to develop their proprietary algorithms in ISO C++ and Visual C++.NET provides the greatest flexibility for incorporating these legacy algorithms into working systems. Furthermore, the .NET Framework and development environment provide the best libraries and tools for rapid development of trading systems.

The first section of the book explains Visual C++.NET 2005 in detail and focuses on the required programming knowledge for automated trading system development, including object oriented design, delegates and events, enumerations, random number generation, timing and timer objects, and data management with STL.NET and .NET collections. Furthermore, since most legacy code and modeling code in the financial markets is done in ISO C++, this book looks in depth at several advanced topics relating to managed/unmanaged/COM memory management and interoperability. Further, this book provides dozens of examples illustrating the use of database connectivity with ADO.NET and an extensive treatment of SQL and FIX and XML/FIXML. Advanced programming topics such as threading, sockets, as well as using C++.NET to connect to Excel are also discussed at length and supported by examples.

The second section of the book explains technological concerns and design concepts for automated trading systems. Specifically, chapters are devoted to handling real-time data feeds, managing orders in the exchange order book, position selection, and risk management. A .dll is included in the book that will emulate connection to a widely used industry API ( Trading Technologies, Inc.'s

XTAPI ) and provide ways to test position and order management algorithms. Design patterns are presented for market taking systems based upon technical analysis as well as for market making systems using intermarket spreads. As all of the chapters revolve around computer programming for financial engineering and trading system development, this book will educate traders, financial engineers, quantitative analysts, students of quantitative finance and even experienced programmers on technological issues that revolve around development of financial applications in a Microsoft environment and the construction and implementation of real-time trading systems and tools.

- \* Teaches financial system design and development from the ground up using Microsoft Visual C++.NET 2005.
- \* Provides dozens of examples illustrating the programming approaches in the book
- \* Chapters are supported by screenshots, equations, sample Excel spreadsheets, and programming code

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#### **Review**

"Building Automated Trading Systems is a must read for anyone developing professional algorithmic trading systems. It brings all aspects of design, functionality and real-time system implementation into clear step-by-step focus. This book will be a first choice reference manual for the serious professional .NET programmer in trading system development."

-- Russell Wojcik, Member of CME and CBOT, Head of Trading Strategy Concentration, Illinois Institute of Technology

"This book is an excellent primer for anyone interested in developing automated or semi-automated trading applications. Ben covers the programming knowledge needed to develop successful trading applications. A must have for traders getting into programming and programmers getting into trading. It will also serve as a useful reference for developing more sophisticated trading tools."

-- Sagy P. Mintz, Vice President, Trading Technologies, Inc.

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Building Automated Trading Systems

With an Introduction to Visual C++.NET 2005

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Benjamin Van Vliet is Lecturer in and the Associate Director of the M.Sc. in Financial Markets at the Illinois Institute of Technology's Stuart Graduate School of Business ([www.stuart.iit.edu](http://www.stuart.iit.edu)). He is also the Certified Trading System Developer (CTSD) program director at i4mt ([www.i4mt.org](http://www.i4mt.org)).

#### About the Author

Ben Van Vliet is a Lecturer at the Illinois Institute of Technology (IIT), where he also serves as the Associate Director of the M.S. Financial Markets program. At IIT he teaches courses in quantitative finance, C++ and .NET programming, and automated trading system design and development. He is vice chairman of the Institute for Market Technology, where he chairs the advisory board for the Certified Trading System Developer (CTSD) program. He also serves as series editor of the Financial Markets Technology series for Elsevier/Academic Press and consults extensively in the financial markets industry.

Mr. Van Vliet is also the author of "Modeling Financial Markets" with Robert Hendry (2003, McGraw Hill) and "Building Automated Trading Systems" (2007, Academic Press. Additionally, he has published several articles in the areas of finance and technology, and presented his research at several academic and professional conferences.

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