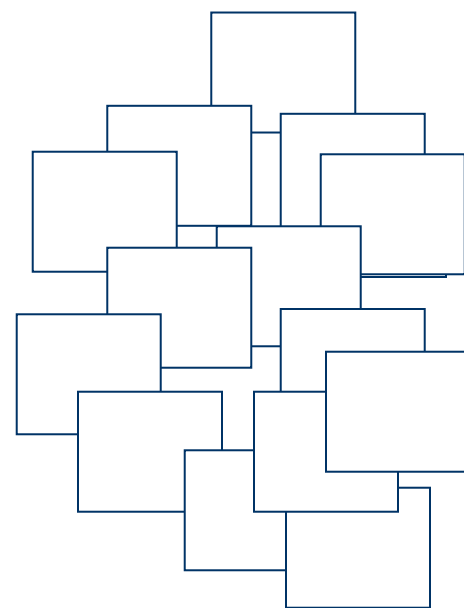




White Paper



Post-Trade Surveillance System

Hawkeye Trade Surveillance System is designed for the Compliance Department of an Investment Banker to detect and monitor irregular or suspicious transaction behavior that may jeopardize the reputation of your business. Hawkeye has been designed with a sophisticated, yet flexible architecture to consolidate all exchange-traded transactions into a central enterprise repository and applies a set of customizable business rules to allow you to perform complex data mining to identify possible market manipulation, mishandled transactions that conflict with the firm's internal trading rules and/or external regulatory agencies' rules and regulations. Hawkeye delivers full transparency to the flow of data between firm's trading activities and its clients.

System Highlights:

Hawkeye Trade Surveillance System has the following features and benefits that allow firms to implement this system with confidence to improve the firm's workflow and thereby get enhanced surveillance on trading activity.

- **Security:** Audit trails as well as security and system alerts can be generated based on pre-defined frequency. Access to the system is password protected. User profiles restrict access to appropriate security levels.
- **Scalability and High Availability:** Multiple instances of the Hawkeye server components can be configured to support fail-over. In addition, the Hawkeye server can be optionally configured to support load balancing in order to ensure superior performance.
- **Ease of Use:** Hawkeye Trade Surveillance System comes with browser-based user interfaces that are extremely intuitive.

Advantages:

- Compliance of Federal Regulations
- Compliance of Company / Internal Regulations
- Improved performance of Compliance department
- Faster Report generation and allows saving of Reports in html or PDF formats
- Ensures fair trading / pricing to customers and this improves customer confidence
- Better service to clients
- Transparency in operation
- Lower operating costs

Financial Instruments handled:

Hawkeye Trade Surveillance System covers a broad spectrum of financial instruments, ranging from straight equity and fixed income to complex derivatives. Hawkeye currently helps you monitor the following financial instruments:

- Equities (Cash & Margin)
- Fixed Income Bonds (Foreign & Domestic – Government and Corporate)
- Derivatives (Equities – Index Options and Futures & Fixed Income – Bond Futures and Bond Futures Options)

Reports:

Hawkeye generates a number of Reports, which includes reports for compliance and internal monitoring. The business logic of some of the reports is as detailed below.

Equities:

- **Short Selling:** Situations where a client has sold more than what he owns and combined with a long sell, it may mean an irregular trade.
- **Fair Pricing:** The execution price for OTC (Over the Counter) sales should not be more than Market Price plus agency commission.
- **Trades at Market close:** Transactions executed 5 minutes prior to market close are reported. This report is reviewed to identify trades if any executed with the intention of market manipulation.
- **Top Ten Price Rise/ Fall:** Identifies trades executed by the firm on securities which were within the top ten gainers/ losers on the exchange for the day and reviews to find out whether any of the firm's trade had an impact on the market price variation.
- **Short Span Trade:** Objective of the report is to find out whether any client has made profit on short span trade , i.e. buying and selling the same issue within 4 business days from trade date and settlement date.

Fixed Income Bonds:

- **Cross Trades:** Checks if any client has bought and sold the same quantity of a particular security at the same price. This could be possibly for tax evasion or Market Manipulation.

Derivatives:

- **Front Running:** Looks for client trades on any particular product that is above 100 Units and detects any proprietary trades done on this product. If the proprietary trade is executed between time receipt of client's order and time of order execution, it is an irregular trade.
- **Cancelled/Non-executed Orders:** The completely un-executed or cancelled orders are reviewed to identify any market manipulation.

Other Reports:

Following are the other reports available currently. However, the Hawkeye Trade Surveillance System is flexible enough to add /modify reports rapidly.

Equities:

- Margin Issue Transactions
- Cancelled / Unexecuted Order
- Cross Transactions
- Insider Transaction Summary
- Daily Market Share 10% Summa
- Front Running Transactions
- Finance Issue Transactions
- Warning Issue Transactions
- Margin Transactions
- Trades at JASDAQ and NASDAQ
- Spoofing Prices
- OTC Trades
- Insider Transaction (details)
- Insider Registration Report
- Employee Trades Report
- NYSE 92 Compliance Report

Derivatives:

- Trades at Exchange Close Time
- Cross Transactions

Fixed Income:

- Bonds Borrow / Loans
- Government Bonds Price Gap (Over/Under 1%)
- Non-Government Bonds Price Gap (Over/Under 1%)
- Foreign Bonds Check Price List
- Bonds Switch Trades

Report Generation Process:

The external data such as Market Data and Insider Data is brought into the application database along with Trade Data and Reference Data such as Customer Master and Product Master. The data is made available in set formats as CSV files. Alternately data can be provided in MDDL(XML) format. The data is then uploaded into a single database and the data validation process is run to remove in-correct data if any. Next the validated data is processed based on pre defines business rules and required Reports are generated and saved. The saved reports are dynamically named for each trade date to facilitate easy retrieval later. All this activities are scheduled to run as a process to save valuable time. During the Report generation process Alerts are generated based rules specified by user. The Alerts serve as summary reports for important reports. In addition to saved reports, reports can be dynamically generated based on different user specified parameters for detailed analysis and study. Historical data is automatically purged to 10 days, 6 months and historical data.

Parametric Reports:

This feature facilitates dynamically generating Reports using parameters specified by user in the GUI and helps in analysis of reports under various scenarios.

Other Features:

- Consolidates data from different sources to a single database.
- Data validation to ensure correct data in required formats.
- Data purging to segregate historic data.
- Automated process from Data upload to Report generation.
- Facility to schedule the entire process to run during lean network traffic periods.
- Alerts generation based on User specified parameters.
- Facility for scenario analysis based on dynamically selected parameters.
- Facility to process Market data in MDDL(XML) format.
- Provision to integrate with Reporting tools such as Crystal Reports

Sources of Data and Interface:

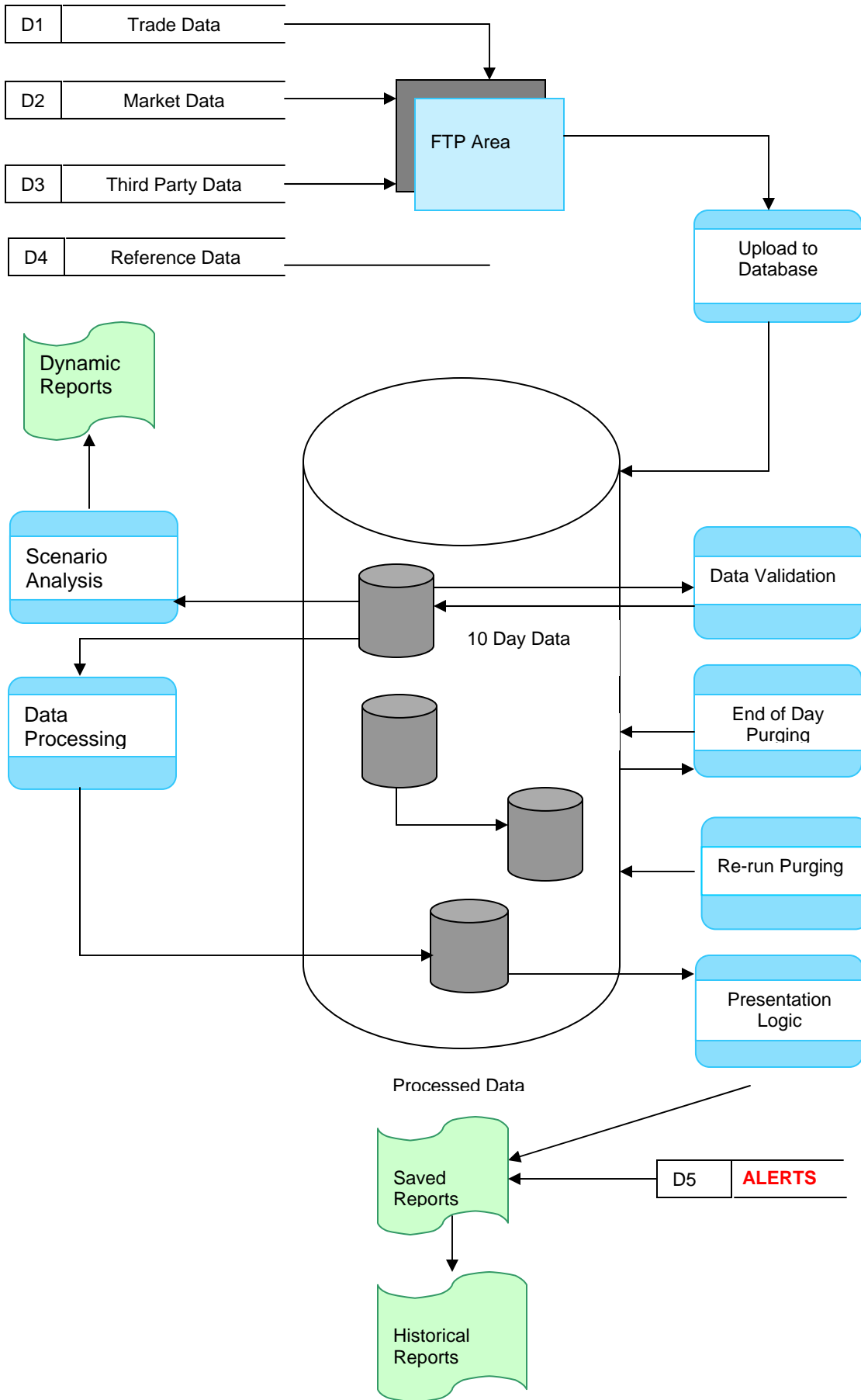
- **Trade Data:** This is made available from customers own trade database. The information obtained includes execution price, execution date and time, execution type and exchange, sales person and customer details.
- **Market Data:** The data obtained from stock exchange like trade volume, day high and day low price and daily market tick price for different securities. The market tick data is updated for every trade date. If the Market data database is residing outside firm, the required data is extracted and put in to the application database. The required data may come either as CSV feed file or in MDDL format.
- **Reference Data:** This relates to master data like customer names, security names to be provided from customer's sources.
- **Third Party Data:** Data like Insider information for all publicly traded firms obtained from third party sources like Toyo-keizai. The data generally available on CDs is used to update the application database quarterly. Each insider is allotted an Insider code to identify trades done by insiders on respective securities

Servers:

Hardware	Pentium III or higher
OS	Linux / Solaris / Windows2000 Server
Web Application Server	BEA Weblogic or Apache Tomcat or IIS
Database	Oracle ,Sybase, SQL server

The solution can be offered either on J2EE or on .NET framework.

DATA FLOW IN HAWKEYE



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