



## **Jordan & Jordan Market Data Services**

### **Representative Engagements**

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## Strategic Consulting Engagements

### Client Type: Global Investment Bank

#### Market Data Spend Analysis

Analyzed the market data usage and spending to identify potential cost reduction opportunities.

- › Reviewed market data vendor contractual obligations, including termination and renewal dates, usage requirements, early termination penalties, etc.
- › Identified current usage and requirements, including under- or non-utilized products and non-essential market data permissioning
- › Provided comparable vendor product comparisons for required data products where available
- › Analyzed vendor product usage to identify potential savings through contractual negotiation where alternative products were not available
- › Reviewed the market data inventory and reporting process to identify opportunities for optimization
- › Developed total annual savings potential based on viable market data alternative products, permission reduction, contractual negotiation and process optimization

#### Market Data Administration Off-Shoring Project Management

Provided project management services over an eight month period to facilitate the migration of market data administrative functions to a new off-shore location

- › Provided day to day support to management throughout the project lifecycle
- › Assisted with strategic planning, timeframes, and project metrics & deliverables
- › Coordinated the recruitment process
- › Developed all IT requirements and worked with technical support both on- and offshore to implement necessary applications
- › Developed training program and documentation requirements as well as organized all logistical requirements for all on- and offshore travel

- › Provided regular communications to management and steering committees

## **Market Data Expense Reduction Project Management**

Provided project management services for an expense reduction initiative focused on displacement of high cost products with lower cost competitive alternatives.

- › Conducted a competitive product displacement programs using a lower cost market data terminal product for a Securities Lending department and a Fixed Income division
- › Prepared recommendations based on usage data for replacing higher cost terminal products with the Finance division
- › Analyzed market data usage within organization identifying departments where potential existed to replace high cost terminal products resulting in significant expense reduction
- › Prepared bi-weekly management scorecards and dashboards communicating status of initiative

## **Market Data Inventory and Process Update**

Analyzed market data spend to realign management of certain categories of market data services, leveraging existing market data management software and administration personnel, and setting up procedures for efficient and ongoing maintenance.

- › Performed a comprehensive review of market data services for market data inventory update
- › Acted as a liaison between client and vendors to ensure appropriate routing of invoices
- › Helped design and implement ongoing procurement procedures to ensure ongoing inventory maintenance
- › Updated and communicated changes and additions to ordering system to market data administration team

## **Market Data Reporting Automation**

Worked with the market data administration team and a major market data inventory system provider to develop an automated vendor and exchange reporting process.

- › Reviewed current reporting processes to identify gaps and areas for augmentation
- › Developed requirements for an automated reporting solution

- › Developed a database solution to produce reports in Reuters DAD, NYSE VRXML, TCB Data Solar, CSV, and Excel formats to report to over 150 vendors and exchanges
- › Worked with market data inventory system provider to link proprietary database solution to market data inventory system for automated reporting
- › Reduced monthly reporting time by over 80% for market data administration staff

## **User-Paid Market Data Spend and Inventory Analysis**

Performed a comprehensive review of general ledger extracts to identify services to be managed in the market data inventory system by the market data administration team.

- › Analyzed over 300 services with a total annual spend of US \$17M, including a review of contracts and invoices as well as reviews with vendor account managers and business owners
- › Documented services including contractual and invoicing details, user makeup, chargeback allocations, and current management processes
- › Worked with vendors to reconfigure invoicing arrangements, coordinating with both the vendor and the internal vendor procurement teams to utilize the client's accepted standard ordering system
- › Added 24 new vendors and 82 services to the market data inventory system and administration processes, adding transparency to market data usage and spending and resulting in market data spend savings of approximately \$175,000 over the next two years
- › Collected over 65 vendor contracts for capture by their internal contract inventory system

## **Fixed Income Application Data Usage Analysis**

Identified market data sources for a global investment bank fixed income application in preparation for a market data contracts review, which included assessing/analyzing internal market data redistribution, usage and storage, reviewing/documenting market data displays within the application

- › Reviewed application and interviewed application owners, stakeholders, database owners, analytics modeling team, and data originators from North America, EMEA, and AsiaPac regions to identify all market data sources, usages and displays
- › Created a flow diagrams to document market data redistribution process within investment bank and the fixed income application
- › Created the Data Source Matrix to document all market data usage and displays within the fixed income application and the original source for each market data

- › Assessed market data control and permissioning at each data distribution channel and storage database
- › Identify potential risk areas within the market data handling process, and made recommendation for future process improvement

## **Client Type: Major U.S. Online Brokerage Firm**

### **Market Data Spend Analysis and Reporting Improvement**

Identified market data spending for a large online retail brokerage firm, which included analyzing invoices & internal resources, performing a compliance analysis of exchange agreements and a review of current exchange reporting procedures to identify shortcomings and make recommendations for improvements.

- › Review all current executed exchange contracts and all fees, both usage based and administrative and compare to terms contained in most recent published agreements by exchanges to identify any disadvantageous terms or compliance gaps
- › Provided an in-depth analysis of all current key exchange policy requirements and fee schedules.
- › Reviewed the current monthly exchange reporting processes and the proposed standardized format for reporting individual users. Identified potential flaws or missing fields in the proposed reporting format specifications.
- › Suggested improvements in the reporting process in order to reduce costs, improve the accuracy of reporting, and make the process more efficient.
- › Conducted an initial review of ongoing contract renewal process and expense forecasting for key exchanges and vendors, to identify areas for further examination.
- › Conducted an initial review of entitlement processes to identify potential process improvements for future examination.

### **Ticker Plant Systems and Operations Analysis**

Performed a review of the people, processes, and technology required to run the ticker plant of a major U.S. online retail broker to provide tactical and strategic recommendations.

- › Conducted reviews with development, operations, and business staffing to develop business requirements and service delivery specifications for market data.
- › Developed ticker plant total cost of ownership for senior management review.
- › Identified proprietary components of ticker plant that could be replaced with commodity hardware and software and made recommendations for a vendor RFI process.

- › Suggested performance monitoring and metering tools and test processes to identify ticker plant thresholds and possible points of failure.
- › Identified deficiencies in operations and development staffing to manage current ticker plant technology.
- › Developed scenarios for ticker plant improvement through in-house incremental upgrades, propriety component displacement with commodity offerings, or outsourcing ticker plant technology and management.

## **Client Type: Major US Buy- and Sell-Side Firm**

### **Market Data Spend Reduction Initiative**

Managed a firm-wide project to reduce market data spend through demand management, product substitution, contract compliance, and vendor negotiation levers.

- › Analyzed over \$200M USD in annual market data spend at the business unit, cost center, and user levels to identify quick wins, long-term savings opportunities, and strategic objectives.
- › Projected annual savings by vendor across four spend reduction levers for communication at the executive level.
- › Worked with business units to execute on savings initiatives identified during analysis phase.
- › Reconciled contracts and invoices to identify instances of vendor over-billing.
- › Developed firm-wide best practices to ensure long-term benefits of market data spend reduction efforts.

## **Client Type: Derived Data Products Creator**

### **Client Compliance with Exchange Policies Concerning Creation and Distribution of Derived Data Products**

Leveraged exchange contacts/relationships and our experience with exchange protocol and policies to verify and document the policies concerning requirements and fees applicable to the creation of derived data products, including securing, completing, and submitting appropriate documents needed for complete compliance with exchange rules.

- › Ensured compliance with diverse market data policies governing the creation of derived data products for over 70 exchanges

- › Contacted exchanges, determined appropriate requirements for index development, and documented policies for referral and future use
- › Completed and submitted numerous diverse agreements and system descriptions required by the exchanges for such application of data

## **Client Type: Hedge Fund**

### **Market Data Infrastructure and Spend Review**

Reviewed current market data infrastructure, including data feeds, desktop products, and applications, as well as annual spend, to evaluate alternative products and vendors.

- › Reviewed invoices to identify data feed vendor, exchange, and third-party service provider fees
- › Reviewed market data inventory for terminal user and application data usage
- › Identified alternative vendor products
- › Performed cost and development analysis of current vendor solution and alternatives based on licensing fees and integration effort for alternative data feeds and applications

## **Client Type: Major Global Exchange**

### **Market Study of Direct Data Feed Pricing and Formats**

Performed a market study of over 50 end user firms and vendors to obtain feedback on direct data feed pricing, data feed formats, and access methods.

- › Developed surveys for market data fees and data feed format and access methods targeting end user firms and vendors
- › Developed alternative pricing scenarios based on data feed licensing and end user access fees
- › Interviewed over 50 end user firms and vendors to elicit feedback on pricing, data feed formats, and data feed access methods
- › Analyzed results to provide exchange with a comprehensive market study to guide strategic development of future data feed products

## **Client Type: Major Global Exchange**

### **Development of Derived Data and Non-Display Policies and Pricing**

Performed analysis of over 20 exchanges globally with respect to current derived data and non-display policies and fees.

- › Developed definitions for derived data and non-display use
- › Developed pricing scenarios and metrics
- › Contacted end user firm representatives to solicit feedback on proposed policies and fee structures
- › Created documentation and complete implementation plan for exchange

## **Client Type: Major Global Exchange**

### **Management of Vendor of Record Application Process and New Client Onboarding Process Development**

Assisted new exchange business unit in achieving vendor of record status with various North American equity and options exchanges.

- › Developed material for each exchange application including systems information and technical diagrams
- › Obtained and completed all exchange application documentation
- › Created a matrix of exchange policies and fees for client comprehension of liabilities
- › Implemented all direct feed requests
- › Developed managed on-boarding process to be used for client's customers
- › Obtained all exchange documentation and crafted templates for customer use scenarios
- › Developed user manual for client personnel managing customer applications and detailing all requirements and process steps

## **Client Type: Major Global Exchange**

### **Market Study for New Market Data Product Offering**

- › Analyzed industry trends and competition to determine opportunities for commercializing a new market data offering
- › Developed pricing strategy and distribution method based on analysis of potential market and unique value of data
- › Documented legal and regulatory obstacles to commercializing product, provided recommendations for overcoming barriers
- › Interviewed industry participants, end-users, and competitors to determine market reaction to new product

## **Client Type: Major Global Exchange**

### **Development of Interactive Vendor Onboarding Process**

- › Reviewed and clarified exchange policies and definitions for vendors and subscribers
- › Developed interactive questionnaire to elicit details about vendor data distribution
- › Created document to assist account managers with applying consistent policies to clients based on questionnaire responses

## **Compliance Assessment Engagements**

### **Client Type: Global Investment Bank**

- › Validated an annual multi-million dollar under-reporting liability in applications used in Europe, the Americas and the Pacific Rim
- › Developed and implemented global application reporting processes to correct systematic underreporting
- › Provided strategic and policy guidance for remediation of applications not complying with exchange contractual and policy requirements

- › Developed and implemented process controls to eliminate the possibility for recurrence of systematic under-reporting
- › Assisted in developing a pro-active strategy to approach exchanges for liability settlements
- › Assisted in preparing for exchange audits, including presenting client's compliance, control and reporting processes to exchange auditors

## **Client Type: Global Investment Bank**

- › Analyzed market data usage of over 200 applications in Europe, the Americas and the Pacific Rim
- › Identified under-reporting for 40 applications costing millions of dollars; recommended remediation activities reduced on-going liability by over 20%
- › Identified application users with access to unnecessary exchange market data. The termination of such access capability resulted in a further significant reduction in annual liability
- › Identified and quantified the annual financial liability associated with incomplete reporting of users permissioned through DACS
- › Identified application deployment and market data permissioning processes that increased compliance exposure and drafted appropriate workflows to ensure market data compliance
- › Integrated Jordan & Jordan's repository of exchanges' market data policies into its workflow
- › Assisted in developing a pro-active liability settlement strategy to approach exchanges, including development of an exchange-by-exchange risk rating analysis, identification of key exchange personnel and expected negotiation levers

## **Client Type: Global Investment Bank**

- › Performed financial analysis of usage of proprietary vendor data products used by vendor desktop software users and applications fed through the vendor data feed for assessment of overall value
- › Analyzed exchange market data usage by 45 applications in North America and identified under-reporting liability amounting to millions of dollars
- › Managed remediation activities of applications responsible for under-reporting
- › Developed an application reporting process and application market data approval workflow to improve compliance

- › Assisted in developing strategies for pro-active settlement of liability

## **Client Type: Global Investment Bank Fixed Income Application**

Identified market data sources for a global investment bank fixed income application in preparation for a phase two of market data contracts review, which included assessing/analyzing internal market data redistribution, usage and storage, reviewing/documenting market data displays within the application

- › Interviewed extensively with application owners, stakeholders, database owners, analytics modeling team, and data originators from North America, EMEA, and AsiaPac to identify all market data sources
- › Created a flow diagram to document market data redistribution process within investment bank
- › Reviewed the fixed income application for market data usage and displays
- › Created the Data Source Matrix to document all market data usage and displays within the fixed income application and the original source for each market data
- › Assessed market data control and permissioning at each data distribution channel and storage database
- › Identify potential risk areas within the market data handling process, and made recommendation for future process improvement

## **Client Type: Top 100 Hedge Fund**

- › Assisted in achieving compliance with major North American securities exchanges' policies
- › Obtained exchange approval for a non-traditional market data entitlement/reporting procedure that resulted in significantly lower market data costs

## **Client Type: Top 100 Hedge Fund**

- › Reviewed its market data infrastructure and recommended options to correct and maintain identified exchange market data compliance issues
- › Developed a response/justification to an adverse audit finding from a major exchange that resulted in a significant reduction in the initial audit assessment

## Client Type: Correspondent Clearing Firm

- › Analyzed market data procedures in place at firm's online brokerage services division with respect to customer on-boarding, exchange agreement management, entitlement systems and exchange reporting
- › Performed a gap analysis with respect to current procedures and compliance with exchange policies
- › Identified potential under-reporting to exchanges and third party vendors
- › Provided policy guidance for remediation of procedures not complying with exchange contractual and policy requirements
- › Made recommendations for procedural improvements and implementation of technological solutions to further provide remediation of compliance issues

## Outsourcing Services

### Client Type: Boutique Investment Bank

#### Outsourcing Services of Market Data Administration

Provided on-site support to effectively manage the market data administration functions of the firm.

- › Managed market data inventory by handling all user entitlements for moves-adds-changes
- › Verified accuracy of invoices by reconciling against market data inventory and contracts,
- › Resolved vendor payment inquiries
- › Analyzed market data user permissioning to identify and remove any unused data feeds and achieve cost savings for the firm
- › Automated the creation of various monthly internal expense reports

## Client Type: Global Investment Bank

### Staff Augmentation: Market Data Manager

Supplied managerial presence to market data administration team while company supervisor was on extended leave, providing guidance and leadership while managing ongoing challenges and changes inherent in the market data administrative world.

- › Acted as interim manager for the Americas Market Data Administration team, supervising daily inventory maintenance and permissioning procurement
- › Managed multiple inventory changes as a result of exchange consolidations and policy changes
- › Assisted in the development and documentation of a global procurement and control process for access to market data through a major global vendor
- › Analyzed and resolved numerous invoice issues, working with vendors and businesses to come up with quick and appropriate responses

## Client Type: US Exchange

### Staff Augmentation: Account Manager

Supplied account management support to the market data services department while multiple team members were out on extended leave.

- › Executed the data feed application process (Exhibit A approval) for new and existing data distributors ensuring that all contractual requirements were met and systems were updated
- › Reviewed vendors technical support and developer accounts ensuring set-up in both the inventory and billing system were correct
- › Processed monthly MISU reports for clients

## Data Usage Audits

### Client Type: Global Investment Bank

#### Exchange Audit Preparation and Response

Assisted client with the management of an audit performed by a major European exchange.

- › Reviewed client market data desktop usage and reporting
- › Reviewed client applications sourcing exchange data
- › Created client analysis of the audit period
- › Reviewed exchange agreements covering the audit period
- › Reviewed official exchange audit report
- › Developed client's response to exchange audit findings
  - › Clarified client position on unit of count
  - › Provided details on applications in question
  - › Calculated client financial reporting position for the audit period
- › Assisted client in face-to-face meetings with exchange personnel and auditors

#### MISU Audit Services

Reviewed Multiple Instance Single User (MISU) reporting process for compliance with New York Stock Exchange policy.

- › Confirmed that MISU reports included all users in the firm's inventory system
- › Confirmed that the firm's inventory system accurately reflected permissioning
- › Confirmed that MISU reports were presented in the required New York Stock Exchange format
- › Confirmed that records were retained in compliance with exchange policy
- › Verified employment status of reported users with the human resource department

## Per Query Audit Services

Reviewed quote metering systems for compliance with New York Stock Exchange's query distribution policy.

- › Confirmed that the quote metering system records all quote requests
- › Confirmed that the quote metering system produces accurate usage reports for the exchange
- › Confirmed that the market hours and holidays recognized by the quote metering system are the actual real-time hours and holidays of the exchange
- › Confirmed that capping is performed in compliance with exchange policy

## Client Type: Major Global Exchanges

### Exchange Audit Services

Reviewed reporting and distribution practices of market data vendors and end-user firms for compliance with exchange policy.

- › Confirmed monthly usage reports to permissioning records
- › Confirmed that vendors collected usage reports from data feed customers
- › Investigated the proprietary applications of end user firms
- › Confirmed that subscriber agreements are executed with all external customers

## Other J&J Professional Services

### Trade Process Improvement

Jordan & Jordan provides recommendations for changes in workflow, systems and procedures for handling trades, operations and client servicing that consider user needs, system requirements, data management, and organizational structure. Representative engagements include:

- › For a global institution, prepared the international and domestic order routing architecture including total cost of ownership of current systems, documentation of existing functionality and flows, desired functionality as well as recommendations for

in-house or vendor alternatives. Strategy included leveraging message-oriented middleware technology and standards.

- › For a major US derivatives exchange, conducted an assessment of their mission critical trading system to determine the underlying causes of occasional outages and service disruptions, and made recommendations for immediate corrective action and longer-term plans to maintain availability with significant increases in volume.
- › For a large retail broker-dealer seeking an efficient order management process for equities, options, fixed income and mutual funds, examined both build and buy alternatives, and created a roadmap suggesting an appropriate route for each security type, and recommendations for follow-up with specific vendors.
- › For a major broker dealer, performed an in-depth order routing and execution analysis, identifying significant opportunities to increase their cost effectiveness and improve their best execution and compliance requirements.
- › Engaged by SIFMA acting in the interests of dealers, and given Federal regulators' concern with market resiliency, as Project Manager Jordan & Jordan is coordinating the industry initiative commonly referred to as "NewBank". The project involves various Regulators of the U.S. government financial markets (including the Board of Governors of the Federal Reserve System, the Federal Reserve Bank of New York, the U.S. Treasury, and the U.S. Securities and Exchange Commission), the two primary U.S. clearing banks (JPMorganChase and The Bank of New York Mellon), major dealers in U.S. government securities, and large institutional investors. The goal is to create a "contingency plan" designed to mitigate market disruption and preserve liquidity in the U.S. government securities markets under certain circumstances.

## Vendor Selection

Jordan & Jordan combines an understanding of the securities industry from a business, technology and operational perspective with a disciplined approach to vendor selection. Our services include vendor qualification, development and distribution of RFI/RFPs, analysis of responses in the form of a requirements matrix. Taking into account functional and non-functional (e.g., cost, existing technology strategy), we evaluate vendor alternatives using objective criteria to provide an informed recommendation.

Representative engagements include:

- › Completed the RFI and selection process for a major global financial information vendor to rebuild its ticker plant and data distribution platform
- › Assisted multinational broker dealer in selecting a clearance processing provider
- › For a national retail broker dealer, examined build vs. buy alternatives for order management systems to handle equities, options, and fixed income securities.

Performed requirements analysis and provided recommendations for follow-up with specific vendors for each security type.

- › Drove the RFI process for a major investment bank in selecting a buy vs. build strategy for reference data
- › For many clients, established a framework and criteria for vendor selection and recommendations for fixed income pricing services and reference data
- › Guided the vendor selection process for a broker dealer to meet trade-processing requirements for mortgage-backed and related securities
- › Developed high level requirements and overall RFP for a replacement price dissemination system for an international derivatives exchange
- › Drove the RFP process at a major hedge fund for the selection of a market data management system
- › Assisted a major mutual fund in selecting/upgrading market data distribution technology
- › Compared retail broker workstation alternatives, including proprietary and third party packages, based on user requirements and technology/operational considerations. Project included RFI development and response evaluation

## Data Management Strategy

Our technology experts have implemented large-scale multi-asset reference data systems for major hedge-funds and investment banks. Together with a disciplined approach to reference data vendor selection and implementation, we have refined a testing strategy known as the Jordan & Jordan Reference Data Testing Framework (RDTF) that can be customized and implemented to fit the specific needs of an engagement.

Representative engagements include:

- › For a premier hedge fund, created a normalized data model for fixed income securities, provided vendor data analysis, designed arbitration and validation rules, wrote test plans and test scripts, reviewed test results
- › For a major broker/dealer, developed a request for information (RFI) on reference data management solutions, disseminated to the top five vendors, analyzed responses and provided recommendations for prioritization and next steps in vendor selection
- › For a primary industry utility, documented business practices in the U.S. municipal and corporate bond new issue process to develop standardized data formats for increased accuracy, timeliness and ease of data collection/distribution/access

- › To support the risk model and securities processing activities of a major prime broker, created a normalized data model for implementation of a fixed income securities master; performed vendor data analysis, designed validation rules for data cleansing and provided support for integration of data into business unit applications
- › For a major service bureau, conducted business requirements research for a corporate actions notification and processing service
- › Conducted global research study for a major provider of standing settlement instructions seeking ways to increase breadth and depth of their product offerings and discover key value points
- › Created a structured framework for client evaluation of vendor data, conducted numerous vendor selection projects on behalf of clients

## Strategic Marketing

Representative engagements include:

- › For numerous clients, particularly financial information vendors, conducted extensive primary market research to support product development initiatives with detailed information related to business requirements, user preferences, distribution channels, pricing structures, and other information critical to successful product introduction
- › Completed an in-depth analysis and provided strategic direction to a major financial information provider which addressed the entire trading process and the implications of regulation, technology, ECNs and new market entrants on their value proposition
- › For a major securities transaction processing service bureau, identified securities processing needs (including data/content needs) of operations officers in global securities firms and recommended strategic positioning for entry into the European marketplace
- › For an international stock exchange, evaluated user needs related to a full range of securities industry activities (syndication, research, and trading processes) to support the information strategy component of their strategic planning initiative
- › Conducted market research to support a joint venture / new product initiative aimed at the buy-side. Topic was data consistency across the investment process from trade decision and support through performance reporting. Research covered mutual funds, pension funds, hedge funds and separate accounts managers
- › Analyzed straight through processing trends and their impact on a financial information database vendor's current and planned initiatives, used for strategic planning process

- › Recommended specific market opportunities for a major equities data vendor to develop and introduce fixed income information services
- › For a major international exchange, identified the market opportunity to become an aggregator/disseminator for other exchanges; developed a market-entry strategy as an information provider.

## Technology Services

- › For a major international software and services provider, developed requirements and assisted in the development of a data distribution platform. Designed and developed several real-time data feeds including consolidated order book and market depth capabilities. Presided over performance testing and pilot client implementations.
- › For a top-tier market data vendor, developed technology and provided early assistance in developing and operating prototypes for their next generation of ticker plant technology including data driven architecture, data modeling and data feed features consulting services. The efforts resulted in a new data feed product offering.
- › For a major US derivatives exchange, developed FAST decoding software and tested / verified FAST 1.1 standards compliance for a new market depth data feed. In this assignment, J&J staff also assisted the exchange with developing specifications for the core software development requirements to produce the new data feed.
- › For a major equities and options exchange, assisted in identifying areas for improvement and created an action plan to increase reliability and availability of the exchange's proprietary technology including order routing, matching and market data systems. For this client, J&J provided specialized financial technology specialists with broad trading systems expertise.
- › For a major international derivatives and stock exchange, assisted in the development and implementation of several trading technology and market data technology improvements including replacement of the exchange's ticker plant technology and reconfiguration and adaptation of the matching engine to support new products and business policy changes.
- › For a top-tier index provider and news service, documented current and anticipated functional and non-functional requirements of an equities ticker plant, drafted a formal vendor RFI, solicited vendor responses, analyzed feedback and provided a technology roadmap.
- › For a major retail broker and correspondent services firm, reviewed the current ticker plant technology and operations, solicited vendor proposals and developed recommendations to achieve improved services and cost structure. For this same client, we also conducted several additional projects including review of requirements

and potential solutions for active trader market data technology and evaluated alternatives for direct exchange feeds.