

MANISH AGRAWAL

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DIRECTOR OF TECHNOLOGY (CAPITAL MARKETS)

Summary: 20 years of experience in managing, designing and developing software applications primarily in the Capital Markets / Financial Services industry.

Product Integration / Project Management Experience: 8+ years' experience in implementing leading products in FIX Connectivity, Security Custody / Corporate Actions, Market Surveillance, Market Maker and Reference Data management. Involved extensive Vendor Management and coordination between multiple stakeholders in various geographies.

'Hands On' Design / Development Experience: 12+ years hands on design & development experience using **Java, Low Latency Applications, Microservices, Cloud (AWS), Kafka, Cassandra, Elastic Search, Oracle, TIBCO, FIX Protocol, Spring, Hibernate, Java Script frameworks (Angular JS, JQuery), DevOps** and various Open Source APIs.

Financial Protocols: FIXP, FIX SBE, FIX 4.4, FAST 1.1, SWIFT (ISO15022), MMTP (SLE & RLC).

Trading System & Market Data Feeds: Drop Copy (FIX 4.4 based) and Market Data (FIX SBE, UDP & TCP Recovery). Familiar with NEWS & Corporate Actions Market Data feeds – Reuters, Bloomberg, IDC.

International Work Experience: Sao Paulo (2.5 years), Singapore (3 years), Hong Kong (1 year), US (0.5 years) and Australia for clients like Chicago Mercantile Exchange (CME Group), BM&FBovespa, BlackRock, JP Morgan Chase, Standard Chartered Bank, Fidelity Investments, SUNGARD, Tokyo Stock Exchange, Nigeria Stock Exchange etc.

Personality Traits: Aptitude for understanding business needs and working efficiently towards delivering valuable solutions. **Management capabilities with excellent communication skills, a flair for analytical troubleshooting**, and the ability to train and motivate high performance teams. Can accomplish multiple priorities within aggressive timelines. Extremely Customer Centric approach.

English Language Skills: Excellent command over English Language. Recently scored 8 out of 9 in IELTS English Ability Test.

Financial Domains Expertise: Trading Systems, Market Surveillance, Market Making, Corporate Actions and Security Custody Services, Reference Data Management.

CORE COMPETENCIES

Technology Skills

Core Skills: Java, Low Latency Applications, Spring Boot, AWS, Microservices, Docker, Kubernetes

Application Server/Web Server: Tomcat, Websphere App. Server 6, Weblogic 5.1/6.1

RDBMS / NoSQL DB: **Elastic Search DB, Cassandra, ORACLE 11g**, SQL Server 2008, IBM DB2, MySQL

Messaging Platforms: **KAFKA, TIBCO EMS, TIBCO RV**, IBM MQ Series

Financial Protocols: **FIX 4.2/4.4, FIX SBE, FAST 1.1, SWIFT (ISO15022)**, MMTP (SLE and RLC)

FIX Protocol Tools: **Cameron FIX / Catalys**, QuickFIX/J FIX Engine

Financial Software: **CameronTec Catalys / CameronFIX, NASDAQ OMX 'SMARTS Integrity', NASDAQ OMX 'Market Maker Monitor', TCS 'BaNCS', 'Golden Source' Reference Data System**

Market Data Vendor Feeds: **Reuters, Bloomberg, IDC**

Cloud: **AWS, S3, Flink, Lambdas, Consul, Elastic Search, Mirror Maker**

Software Methodology: Agile/SCRUM, SDLC, Rational Unified Process based on UML

Operating Systems: Linux, Windows x86

DevOps: **Bootstrap, CHEF, Jenkins, Hudson, Nexus, JIRA, Confluence, Cucumber, Fortify, Maven, SVN**

Java Script Frameworks: **Angular JS, Node JS, JQuery**

Artificial Intelligence (AI) / Machine Learning: Attended trainings on Machine Learning with Python (Numpy, Pandas, SciKit, Matplotlib) & R, Deep Learning with Tensor flow & Keras, NLP, CNN, ML / AWS

Blockchain: Recently attended trainings on **Blockchain fundamentals, Smart Contracts with Ethereum**

Other: JavaScript, Linux Scripting, PERL, BIRT, ALICE Alerting Language, Ajax, JSON, TCL/TK,

PROFESSIONAL EXPERIENCE

IIFL WEALTH, BANGALORE, INDIA

May 2020 – Till Date

(Largest Wealth Management Provider in India, with AUM in excess of 24 Billion USD)

HEAD OF APPLICATION DEVELOPMENT

- ◆ **Managing Data Analytics, Wealth Management and Salesforce Platforms** – Managing multiple key platforms of the group like *Altior* for Data Analytics and *Caliber* for Wealth Management and driving efficiencies efforts in Development processes, Release Management, Deployments, Support and overall Application Governance. Also driving efforts for in-sourcing Salesforce CRM Platform and organization wide Access Management System. Leading a team of ~40. Using technologies like Java, Spring Boot Microservices, Python, AWS, MySQL DB, Python, ReactJS and many more.

J.P. MORGAN CHASE & CO., HYDERABAD, INDIA

Aug 2019 – May 2020

(One of the largest Global Investment Bank with Asset Management, Custody & Retail Banking divisions)

VICE PRESIDENT, CREDIT RISK TECHNOLOGY

- ◆ **Migration of Legacy Credit Checking Application from Mainframe to Microservices / Cloud** – Managed a team of 10 to facilitate migration of existing Credit Checking application for Custody Business from AS400 / DB2 based Legacy Application to Java based Applications using Microservices & Cloud Architecture. The planned 2 year migration needed to be carried out in phased manner, while also supporting the ongoing BAU enhancements. Used technologies like Java, Spring Boot Microservices, Docker and Kubernetes based Internal Cloud, Kafka and Elastic Search DB.

CME GROUP (CHICAGO MERCANTILE EXCHANGE), INDIA

Jul 2016 – Feb 2019

(Largest Derivatives / Commodities Exchange in the World, Owner of NYMEX, COMEX & CBOT Exchanges)

MANAGER SOFTWARE ENGINEERING

(Trading Systems Components Development / Support during India Time zone)

- ◆ **Development of Additional Market Data Channels for EOD Settlements** – Managing development of new Market Data Channels for CME's Streamline Market Data Platform to distribute EOD Settlement & Valuation data for some products for which, the data distribution is not real time. The channels will receive data from some internal systems via Kafka and distribute them in FIX SBE format to market participants and persist in Cassandra Cluster for recovery. In the 2nd phase of project, this data will also be stored in AWS S3 buckets for historical availability. Uses technologies like Kafka Messaging, FIX Binary (SBE), Cassandra, AWS, S3, Vanguard, Java.
- ◆ **Migration of CME's Market Data Platform from Oracle EXADATA to Cassandra** – Project involved migrating CME's Market Data platform from expensive Oracle EXADATA to NoSQL Cassandra DB for persistence / recovery. The project involved understanding the constraints involved and working around them via code changes / table design changes / indexes. It also involved extensive functional / non-functional testing as well as porting existing Cucumber based Automation Framework. Technologies Used: Datastax Cassandra 3.10, Cucumber Framework, Java, TIBCO FTL.
- ◆ **Reduced Tick Enhancements to Support 9 Decimal Digits Pricing** – Successfully managed the delivery of this project, involving enhancements in many Pricing, Settlement Gateway and cmegroup.com applications to support 9 decimal digits pricing for CME's Two-year Treasury Notes Futures product. Involved making code and DB changes and using updated underlying Market Data libraries. Used technologies like Java, Ticker Plant Market Data API, TIBCO FTL, AWS, Kafka, Mirror Maker, Flink, Lambda, Cassandra, Oracle.
- ◆ **Development of Cross Venue Risk Enforcement for Order Entry** – Successfully delivered this year long, large-scale system which received real time Risk Reports from a system that aggregated data from all of CME's trading / clearing activities and generated Risk Reports when Risk Limits defined for Clearing Entities / Accounts were breached. Based on these Risk Reports, New Order Entry was blocked at Order Entry Gateways for these accounts in near real time. Used technologies like Kafka Messaging, TIBCO FTL, Java, Oracle, JSON.
- ◆ **Globex Trading Systems Components' Development / Support for CME** - Includes Order Entry / Drop Copy Gateways, Realtime and historical Market Data Components, Pricing, Settlement Gateway, Recovery,

cmegroup.com site and other surrounding systems in Trading System Infrastructure. May of the core components like OE Gateways and Market Data being extremely Low Latency sensitive and highly concurrent.

- ◆ **Technical Manager** of Ten Persons Development & QA team, accountable for Guiding Development / Design for projects and resolution of Support Issues. Involved usage of Java, Low Latency (Concurrency, LMAX Disruptor Pattern), Cassandra, Oracle, Kafka, TIBCO FTL / RV, FIX Protocol including SBE (Simple Binary Encoding), AWS, Flink, Lambda, Mirror Maker and many more technologies.

LASALLE TECHNOLOGY GROUP

Apr 2014 – Jun 2016

(Acquired by Itiviti, was a leading Consulting Company for FIX Protocol based Products / Services)

SENIOR TECHNOLOGY CONSULTANT (Worked remotely from India)

Project1: FIX Enablement of Equities Trading System for Wealth Management Client

- ◆ This was a project to FIX enable a Web based Equities Trading System for a Wealth Management provider in Sydney, Australia.
- ◆ Web based Trading System invokes Webservices to the FIX Order Router Product that constructs a FIX message for each request and passes it on to an Execution Broker based in Asia. The FIX Order Router product also manages the Orders' states and passes it on to Web Application upon request.
- ◆ **Technical Specialist** of three-person team, accountable for technical implementation of Java based Webservice and management of Orders in FIX Order Routing Product, **including 'Hands On' development**. The implementation used Java, Webservices and Catalys FIX Routing Product.

Project2: Nigeria Stock Exchange XDB Maintenance / Enhancements

- ◆ The project was a follow up phase post the Exchange's recent migration to X-Stream Trading System and XDB system implementation. It involves carrying out development of previously undelivered reports and performance enhancements in existing reports.
- ◆ **Senior Member** of three-person team, accountable for **development** and testing of BIRT reports; Enhancements in SQL Server artefacts' optimization.

B3 SECURITIES & FUTURES EXCHANGE, Brazil

Sep 2011–Jan 2014

(Earlier BM&F BOVESPA, is the largest stock exchange in South America and one of the largest in World)

SENIOR SPECIALIST – Systems Development, Trading Systems Division

Project1: SMARTS Integrity, Market Surveillance Product for MegaBolsa Trading System and new PUMA Trading System

- ◆ Integrated NASDAQ OMX's product for Mega Bolsa, and for equities and derivatives segments of PUMA trading system (Exchange's single multi-asset class system). **Deployed product in two stages** – for legacy MegaBolsa Trading System using MMTP (SLE and RLC) feeds for equities segment, and for PUMA system using Drop Copy and Market Data interfaces
- ◆ **Led a team** of four IT personnel for implementation, analysed system infrastructure and feed specifications to provide inputs for integration, and liaised with several parties for consolidation of functional and technical requirements as well as subsequent review of specifications
- ◆ Developed project plans; tracked progress; and managed functional as well as non-functional **testing of releases** (including review of test plans, deployments, and issue tracking)
- ◆ Reviewed deployment guide and facilitated definition of system monitoring and job automation processes
- ◆ Worked with Bloomberg Terminal and evaluated Bloomberg news feeds for **identifying 'Insider Trading' instances**

Project2: NASDAQ OMX's 'Market Maker Monitor' Product Implementation

- ◆ The product monitored whether market makers for equities/options/futures securities were meeting their contractual obligations for maximum spread and minimum volume
- ◆ **Important member** of five-person team, accountable for development of custom alerts and reports; integration with an external management system (contracts, rules, and market makers); and identification of custom enhancements

RENAISSANCE TECHNOLOGIES / FAIRHOPE TECHNOLOGIES SINGAPORE

Aug 2010–Aug 2011

(Providers of IT and manpower staffing solutions in Singapore)

TECHNICAL LEAD

Project1: Reengineering of BlackRock's ETF Trading Platform, iShares

- ◆ Project aimed to develop a new version of iShares for enabling authorised participants/market makers to subscribe/redeem units of ETFs listed on different exchanges
- ◆ Designed and developed application using Java, Java EE, Spring, Hibernate, Ajax, Java Messaging System, and Sybase DBMS

Project2: Development of Mobile Banking Application for UOB Bank (for client, Tagit Mobile)

- ◆ Developed **technical design** and specifications, and **UI design mock-ups** for mobile application based on Tagit's Mobeix platform.

STANDARD CHARTERED BANK (SINGAPORE) LTD., Singapore

Aug 2008–Mar 2010

(Standard Chartered Bank is a 150 year old UK bank with operations in Asia, Middle East and Africa.)

TECHNICAL ANALYST – Securities Services Division, Custody Business Operations

Project1: Implementation of TCS BaNCS, Corporate Actions' Product

- ◆ **Migrated CAPE** (Corporate Actions Processing Engine) from legacy NCS (custodian application) to Java/JEE based vendor product, TCS BaNCS
- ◆ Key member of six-person team, accountable for **rolling out system** with 15 interfaces in **four Asian markets** (within six months) and coordinating with teams in multiple geographies (Singapore, Malaysia, Hong Kong, Chennai, New Delhi, etc.)
- ◆ Built interfaces between BaNCS and existing system using Enterprise Service Bus (ISIS) for several systems such as custody, cash, SWIFT, FIX messaging, fax/email, reference data, client interface, reporting, etc. – authored detailed specifications, coordinated with vendors, and tested code
- ◆ Developed programs for reconciliation of generated and sent messages/files
- ◆ Coordinated test environments' availabilities, user access, enhancements, and **bug fixes**.

Project2: Implementation of Golden Source, a Reference Data Management Application for Bank's Security Services Division (for data acquisition and consolidation)

- ◆ Undertook technical analysis, deployed product, and **coded programs** for comparing feeds from different vendors (for vendor selection and integration)
- ◆ Successfully implemented the product within four months (including integration with Reuters).
- ◆ Evaluated Bloomberg, Reuters and IDC Corporate Actions feed, eventually integrated with Reuters because of cost reasons.

TECH MAHINDRA LTD., Hong Kong, US and Pune, India

May 2007–Aug 2008

(Worked in Satyam Computer Services, later acquired by Tech Mahindra, India's leading IT Services Firm.)

SENIOR SYSTEMS ANALYST – BFSI Projects Division

Project1: Proxy Voting Enhancement in Custodian Application, PCCLASS for JP Morgan Chase Bank (Taiwan)

- ◆ Developed modules using Java, JSP, Spring, Hibernate, Oracle 9i PL/SQL, Tomcat, and Eclipse 3.2.1

Project2: Sub Custody System Development for In-sourcing JP Morgan Chase Bank's Sub Custodian Process (India)

- ◆ System was developed and implemented to **reduce costs**; and increase control, flexibility, and scalability of operations
- ◆ Important member of design team, in charge of identifying appropriate technologies and frameworks; and **developing POCs**.

Project3: Development of IDM (Intranet Deal Management) application for JP Morgan Chase Bank (USA)

- ◆ The application enabled **customisation of service offerings** (including pricing) for clients
- ◆ **Led a team** of five personnel, coordinated offshore and onsite development, and developed several modules of the application.

FIDELITY INVESTMENTS INDIA, Bangalore, India

Jan 2005–May 2007

(One of the world's largest providers of financial services, with assets under administration of US\$3.8 trillion, including managed assets of US\$1.7 trillion, as of November 30, 2012.)

SENIOR SOFTWARE ENGINEER – e-Business Division

Project1: Development of Voyager eWorkPlace, HR and Payroll Product for Fidelity's FESCo Division (USA)

- ◆ Developed modules using Java, JSP, Struts, and Oracle PL/SQL

Project2: Enhancement of Net Benefits Application for Fidelity's Net Benefits (Health and Welfare) Division (USA)

- ◆ Undertook several maintenance and enhancements projects for Net Benefits application (largest provider of 401k, defined benefits, and defined contributions plans in USA)
- ◆ Managed a team of two personnel for module development, and **redesigned** the health and welfare **section** of Net Benefits site

CAP GEMINI FINANCIAL SERVICES, Pune, India

May 2002–Jun 2004

(Worked in Kanbay Software, which was later acquired by Financial Services Business Unit of Capgemini)

CONSULTANT (FT EMPLOYEE)

Project1: Redevelopment of SunGard Data Systems' InvestOne NG product

- ◆ Redeveloped investment management product using Java/JEE to reduce costs (enabling smaller fund houses to buy it), and increase flexibility
- ◆ Developed POCs using Java, Struts, XML/XSL, JSP, DB2 PL/SQL, Websphere Application Server, JavaScript, etc.

Project2: Development of Manheim Inc.'s product for selling used cars through e-commerce auctions

- ◆ **Managed two personnel** and developed several modules for the application

NIIT TECHNOLOGIES LTD., New Delhi, India

Oct 2000–Dec 2001

(Leading IT solutions organisation, servicing customers in North America, Europe, Asia, and Australia.)

SYSTEMS EXECUTIVE

Project1: Development of Information Management System for Tokyo Stock Exchange (on behalf of Deloitte Tohmatsu Consulting)

- ◆ The system was developed to manage all member companies' information
- ◆ **Successfully** developed several modules for the system

Project2: Development of E*Best, Benchmarking Portal for SPRING Singapore

- ◆ Part of ten-member team accountable for developing modules for the system

EDUCATION

PGDCA in Computer Applications from NIELIT, New Delhi, India in Jul 1998.