

Rajiv Shukla

SUMMARY:

- Technology Manager experienced in design and development of low-latency Market Data feed-handlers for trading applications that include dark pool, smart order router, and execution algos.
- Architected, designed and developed several market data product innovations starting from ideation through development, testing, integration with trading applications and successful rollout to live trading.
- Over 12 years of experience as a Software development manager at Bloomberg, Morgan Stanley, and Citadel.
- Extensive experience with integration of 3rd party Market Data systems from Exegy, Bloomberg, Reuters, Vela, and Redline.
- Passionate about mentoring and building strong technology team - recruited, identified, nurtured, and helped promote key technology talents.
- Experienced in managing global development team with developers in North America, EMEA, and APAC.

EXPERIENCE:

Morgan Stanley, NY **Technology Consultant**

5/19 - present

I am a C++ developer working for execution algo team. I work closely with Quantitative Research to implement new algos. Currently I am working on an algo that trades S&P and NASDAQ E-Minis by leveraging short term alpha gleaned from CME order book feed.

Citadel Asset Management, NY **Non-compete**

11/18 - 5/19

Citadel Asset Management, NY **Director / Real-time Market Data**

5/18 - 11/18

I managed a team of 8 market data developers for Citadel asset management. We sourced real-time market data primarily from Reuters and Bloomberg and distributed those internally over TIBCO message bus to Citadel internal consumers including CLB crosser, portfolio monitors and workbenches, pre-trade risk control applications, etc. We also facilitate capture and retrieval of historical market data.

In addition, I wrote SIP (CTA + UTP) feed handler and helped build feed handlers for CME, ICE, and Euronext Optiq for front-office trading technology team.

Morgan Stanley, NY **Executive Director / Global Head – Market Data Development & Engineering**

7/10 - 5/18

I managed a team of 25 market data developers and integrators in North America. We developed feed-handlers for all major Equity, Option, and Futures exchanges in the US, Canada, Mexico, and Brazil. My team built a full market data stack which included, in addition to parsing of exchange feeds, content normalization, depth-of-book aggregation, composite book creation, page shredding, basket calculation, intraday history calculation, and end of day pricing. We also implemented a distribution system for market data including a binary protocol with pluggable support for transport over TCP, Multicast and shared memory, an event and data model, and client API in both C++ and Java.

In addition, my team developed feed-handlers for FX, Fixed Income, and IoI feeds globally. I led another small team focused on the development of core technologies to facilitate building of feeds and we used it globally.

As global head of development I also provided strategic directions to all market data systems built and deployed in EMEA and APAC. The development managers in those regions had a reporting line into me.

The most significant accomplishment of my team was global delivery of a low-latency market data solution for Morgan Stanley Electronic Trading in the US, EMEA, and APAC. Besides 2+ orders of magnitude latency reduction compared to prior systems, we were able to innovate in diverse areas including market data API for C++ and Java consumers, a common data and event model across regions and asset classes, monitoring of market data systems, hardware and OS

level optimizations, integration with niche vendor products, and deployment choices ranging from our legacy data centers to Exchange co-locations.

I collaborated very closely with key stakeholders (technologists, strats, and business managers) from diverse areas such as Morgan Stanley Electronic Trading (dark pool, SOR, Algo), FX, Rates, Commodities, program trading, front-end GUIs, client gateway, DMA, exchange connectivity, risk, compliance, reference data, pricing history to help build market data solutions suitable to their content, location, and latency requirements.

I was very hands on with both Operations and QA and worked with them on a daily basis. Key areas of collaboration were training them on technologies my team built and vendor products we integrated with, building tools for monitoring and market data visualization, helping resolve crisis and outage situations, reviewing test plans, test results, and building test tools for QA.

Bloomberg LP, NY

6/03 - 6/10

Developer/Manager, R&D – B-Pipe/BPOD

Spent 6 years in design and development of Bloomberg B-Pipe/BPOD - a real-time, consolidated market data feed platform from ground up with eventual leadership role as a Development Manager.

I started as a lead developer and later managed a team of 6 developers in New York and London. My team was responsible for back-end infrastructure of B-Pipe which processed and enriched over 2 million price updates per second before delivering to the downstream delivery infrastructure.

Designed/developed critical infrastructure components B-Pipe/BPOD was based on -- real-time, in-memory database; distributed cache; communications library on TCP/IP and in-house implementation of PGM, etc.

Worked extensively with clients to help them integrate B-Pipe into their market data platforms.

Telcordia Software Engineer Bellcore Software Engineer

6/98 - 6/03

7/95 - 5/97

I spent 7 years altogether at Telcordia (formerly known as Bellcore) as a developer of middleware and platform services for distributed telephony applications. The primary product we built was known as System-Pilot which provided services such as process management, configuration management, alarms, logging/tracing and pub-sub messaging. The System-Pilot SDK provided a C++ API for applications to use and leverage those services. In addition, included with the product was a GUI console to visualize and manage status and alarms from application processes deployed across many hosts in a local and/or wide area network.

We also built services such as authentication & authorization for distributed applications, shared memory cache of reference data to speed up access to frequently used data, code generators, Java API for logging and alerting, etc.

GTE Laboratories Senior Member of Technical Staff

5/97 - 6/98

EDUCATION

University at Albany, New York - **MS, Computer Science, 1993 - 1995**

Jadavpur University, Kolkata, India - **MCSE, Computer Science & Engineering, 1990 - 1992**

Jadavpur University, Kolkata, India - **BCSE, Computer Science & Engineering, 1986 - 1990**