Liam Mooney
(Singapore Citizen)

Personal Profile

Software Engineering Leader with 20+ years' experience researching, designing, developing & supporting a diverse range of software solutions. With a passion for driving highly productive teams through agile process, automation, clean-coding, the appropriate use of open source & software engineering best practices.

Areas of Specialisation

- Software Engineering, Cloud Architecture, Data Engineering, Recommender Systems, Agile Transformation
- Microservices, Kubernetes, Distributed Systems Observability, Networking, Security, GitOps, DevOps
- Java, Spring Framework, OO Design Patterns & Principles, Refactoring, Test Driven Development, Performance analysis, Data Structure & Algorithm optimization

Career Overview

- **Standard Chartered Bank**, January 2017 - Present — Head, Cloud Enablement, Integration Services
- **Crayon Data**, May 2014 – December 2016 — Head, Engineering & Architecture
- **Xiam, a Qualcomm Company,** July 2005 – May 2014 — Staff Software Engineer
- **CriticalPath**, March 2004 – July 2005 — Technical Support Engineer
- **Adaptive Mobile Security**, April 2003 – March 2004 — Security Software Engineer
- **Logica Mobile Networks**, July 1999 – January 2002 — Technical Team Lead
- **Aldiscon,** February 1997 – September 1997 — Intern Software Engineer

Education

- **Master of Technology, Software Engineering,** CAP: 4, National University of Singapore, Jan 2009–May 2011
- **BSc. Computer Systems,** 2:1 honours degree**,** QCA: 3.25, University of Limerick, Ireland, Sept 1995-June 1999

Academic Awards

- Best Final Year Project, Master of Technology, Class 2011, National University of Singapore
- Best Final Year Project, BSc Computer Systems, Class 1999, University of Limerick

Professional Certifications

- AWS Certified Solutions Architect – Professional
- TOGAF 8 - Certified Enterprise Architect
- Scrum Alliance - Certified ScrumMaster
- Sun Certified Developer for Java Web Services - J2EE 5
- Sun Certified Business Component Developer for J2EE 5
- Sun Certified Web Component Developer for J2EE 5
- Sun Certified Java Programmer for the Java 2 Platform 1.4

Professional Experience:

Standard Chartered Bank, January 2017 – Present

December 2019 - Present, Singapore
Role: Head, Cloud Enablement, Integration Services

Currently leading the Cloud Enablement stream for Integration Services, a large team in Foundation Technology Services.

This Cloud Enablement programme comprises of two main streams:

- Extend our Core Platform to enable our portfolio of Integration Service solutions on the Public Cloud, including:
  - Enterprise Data Management Integration (EDMi, webMethods Integration Server & Message Broker)
  - Internal & External API Gateways (Kong API Gateway & WSO2 Identity Server)
  - Solace PubSub+ Message Routers
  - IBM MQ
  - Managed File Transfer (Axway Transfer CFT)
- Instil a "Cloud First" culture across Integration Services
  - Supporting the adoption of Cloud Infrastructure through automation & declarative onboarding
  - Training engineers on Cloud Native technologies & best practices.

I have built up a new a Cloud Engineering function within Integration Services, a distributed team of primarily Software Engineers, with public/private cloud experience, who work to further evolve the Integration Services Core Platform to support public cloud (AWS & Azure) operations.

Overview of Technologies Employed

AWS, Terraform, Ansible, Podman containers, Spring Cloud Microservices, Kubernetes (AWS EKS), GitOps.

Observability stack includes Prometheus, Grafana, Elasticsearch, Logstash, Kibana & Jaeger OpenTracing.

January 2017 - December 2019, Singapore
Role: Development Lead, Core Platform, Integration Services

Led the Integration Services "Evolution stream", tasked with building the next generation ESB platform for the bank. The Platform was built using Cloud Native technologies & enabled new ways of working, including DevOps, Software Defined Delivery & Site Reliability Engineering. My responsibilities / activities included:

- Leading a SCRUM team of eight engineers in Singapore & Bangalore
- Building the CI & CD platform for all existing "first generation" services
- The Platform acts as an enabler for DevOps & Site Reliability Engineering in the department
- Software Defined Delivery: Automating all existing & new activities, using "GitOps" – zero manual steps
- Microservice architecture, inspired by Spring Cloud / Netflix OSS stack.
- OpenShift Container Platform / Kubernetes
- GitOps Traffic Management built on Envoy service proxies & custom control planes
- Distributed System Observability: Logging, Monitoring, Tracing & Capacity Planning
- Technically leading in other SCB Foundation services programs:
  - Messaging as a service: Solace Message Router
  - Internal & External API Gateways (Kong API Gateway & WSO2 Identity Server)
  - Elasticsearch as a service: EFK stack
- Recruitment and team building

Overview of Technologies Employed

Custom Jenkins shared libraries & Gradle Plugins in Groovy & Java, heavily leveraging Spring Cloud, for building, packaging, publishing & releasing all integration services artefacts.
Ansible, Docker containers, Spring Cloud Microservices, Kubernetes (OCP), GitOps deployers, custom & ArgoCD.
Traffic Management using: NGINX, HAProxy, Envoy, Contour. Observability stack includes Prometheus, Grafana, Elasticsearch, Logstash, FluentBit, Kibana & Jaeger OpenTracing.

Crayon Data, May 2014 – December 2016

May 2014 – December 2016, Singapore
Role: Principle Architect / Product Engineering Lead

At Crayon Data we built a Big Data Analytics Software as a Service (SaaS) Platform, which aims to help enterprises better understand & monetize digital interactions with their customers, for example with banks:

- Increase transactions in payment cards
- Increase the uptake of promotional offers
- Identification of new lucrative partners and offers

Responsibilities:

- Responsible for the architecture and successful implementation of all Crayons products & platforms
- Directly leading three SCRUM teams (two in Chennai & one in Singapore) to build these components
- Leading & mentoring a team of solution architects to develop software architectures, define work streams and lead their respective SCRUM team members through software development sprints
- Close collaboration with the Data Science team, ensuring best practices so we can quickly evaluate the business value of and productionise their predictive models.
- Responsible for ensuring enterprise data security & optimising infrastructure costs for all R&D activities.

Major Initiatives:

- Leader in building up the software engineering function in Crayon from a very nascent state into an effective geographically distributed organisation of 3 SCRUM teams. Also led in numerous other initiatives which contributed towards leading Crayon on its journey from an enterprise analytics service-delivery company into a product-driven software development organisation.
- Key instigator of, and leader in an organisation-wide Agile transformation program.
- Proposed and received senior stakeholder buy-in for the development of two major software platforms upon which Crayon could strategically position itself for rapid application development on our key IP:
  - Crayon Data Platform – Data integration, analytics & governance platform
  - Crayon Choice Platform – Platform to rapidly rollout & evaluate our recommender systems
- Instigated & directed the rollout of major changes into how Crayon leveraged the Cloud leading to reduced costs (> 50%), higher productivity & greatly improved team capabilities, all of which fed into better products
- Initiated & led the rollout of Crayon DevOps strategy, including full automation of all infrastructure, software and data deployments.
- Ensured compliance of our product deployments with international banking cloud security standards
- Enterprise Architecture initiatives in the areas of Data, Information, Security, Application and Technology architectures.

Overview of Technologies Employed

- General: Java 8, Spring Framework (extensive use), Hypermedia REST services, Swagger, Flyway
- DevOps: Git, Maven, Jenkins, Nexus, Docker, AWS Cloud (extensive use), Shippable, Puppet

Data Analytics & Predictive Modelling Activities

- Recommender Systems, built, evaluated & deployed many flavours; Collaborative, Content & Model based Recommender Systems & Blenders, which were on-boarded onto our algorithm agnostic Choice Platform which is a Search Engine Powered Recommendation Engine, unifying Information Filtering & Retrieval
- Direct Marketing Campaign generation. Given certain campaign objects, identify who to target and with which offer / recommendation.
- Back-testing (Lift / gain chart generation, curve fitting, etc.), optimization of outgoing recommendations
- Predictive Model Building & Evaluation: Apache Mahout, Apache Spark MLlib, Apache Giraph, LensKit
- Predictive Model Compression, compression of large data models (multiple TB) into constrained RAM (~240GB) cluster nodes using efficient libraries such as Colt, Trove, fastutil & various encoding algorithms.
- Supporting our Data Science team who were involved mainly with Natural Language Processing, of unstructured text, such as product reviews. We used NLP to infer better values for our structured entity fields or augment these items with new attributes such as trends, sentiment, etc.

Data Engineering Activities

- Built Data Processing & Analytical Pipelines using Spring Batch, Cascading, Apache Crunch & Apache Spark
- Scalable pipelines, capable of handling both small and big data. Abstraction of distributed file systems, can run pipelines on local, HDFS & S3 file systems. Dataset Serialisation Abstraction Layer using Cloudera KiteSDK
- Metadata driven data processing, datasets annotated / tagged at multiple levels Avro, S3, Oozie & Falcon
- ETL pipelines, between relational & NoSQL databases, including Solr, HBase, MongoDb & Couchbase
- Data Acquisition, crawling using Apache Nutch & Bixo & Data Ingestion / Integration of data streams from multiple partner sources into our Data Lake. Sources included AWS S3, SFTP & partner web services (Spring Integration, Spring REST) into Crayons Data Lake.
- ETL of data from Data Lake (Hive, Parquet) into data processing cluster - HortonWorks Data Platform
- Operations and Management of Hadoop clusters using Apache Ambari
- Data Standardisation (cleaning) & Data Validation of data streams using Apache Pig
- Deduplication / Entity Resolution using MapReduce running on Cascading & later Apache Crunch
- Data Enrichment / Augmentation of datasets, using data mining algorithms & integration of partner data
- Publishing of datasets into our data marts on HDFS and S3 (MySql for Catalogue metadata, Apache Sqoop)
- Indexing of datasets into Apache Solr Search Engine, using Cloudera Morphlines
- Data Governance using Apache Falcon and orchestration using Apache Oozie.
- Onboarding of new data pipelines using proprietary user interface, by non-technical users.
- Data Architecture: Mentored our Data Modelling team to build capabilities in Master Data Management.
- Defined Crayons external data models based largely on schema.org ecommerce models.
- Data security: Designed & implemented cloud infrastructure & policies to protect our data from both internal and external threats.
- Experiments integrating HBase with Apache Phoenix & Cloudera Lily Indexer
- Some use of open source ETL tools like Pentaho, Talend, Tungsten Replicator & StreamSets

Xiam, a Qualcomm Company, July 2005 – May 2014

November 2010 – May 2014, Singapore
Role: Technical Architect

Responsibilities & activities:

- Research & development of predictions technology for Android mobile devices
- Leading the software engineering aspects of the machine learning group. Assisting our data scientists & mathematicians to improve their software engineering output by redesigning their prototypes to best OO practices. Evangelising appropriate Open Source & best practices, conducting mentoring & training sessions
- Profiling and optimization of our software to reduce resource cost, such as battery power consumption, CPU and memory footprint. Design of efficient & appropriate data structures & algorithms to achieve this
- Design & development of J2EE Web Services to support our field trials including associated client APIs. A major part of this was data collection, filtering & transformation for processing by our prediction algorithms
- Design & development of reusable frameworks; for example, client and server persistence layers, common application infrastructure & secure public APIs for 3rd parties to query our predictions engine
- Investigation of issues from the Google Play Store, which often required an in-depth familiarity of the Android & Linux kernel source code
- Research and evaluation of Open Source APIs and frameworks to improve both our product & productivity
- Promotion of software engineering best practices, design, test driven development, clean coding, refactoring. Delivering consistent improvements to our development & continuous integration environments

The focus of our effort was on the Consia™ Predictions Engine which used statistical & machine-learning techniques to predict future user actions/location and thereby optimize the user device experience. We released two Android applications to demonstrate the capabilities of the Consia™ Predictions Engine while also increasing awareness of Qualcomm's Snapdragon brand: Snapdragon™ BatteryGuru & Snapdragon™ Glance.

- CPU Load Prediction
- Native Android Initiative
- Consia™ BatteryExtender - OEM Integration
- Consia™ BatteryExtender

- Snapdragon™ Glance
- Machine Learning Predictions
- Snapdragon™ BatteryGuru
- Consia™ Predictions Engine
- Haystack Vodafone Project
- Plaza Global – Brew™ Recommendations

June 2007 – November 2010, Singapore
Role: Integration Solutions Architect / Technical Team Lead – Asia Pacific

Responsibilities & activities:

- Technical lead for the Asia Pacific region, involved in most areas of the software development life-cycle
- Responsible for all Asia Pacific customers as well as core product functionality. Customers include: Indonesian operators Hutchison, Telcomsel & Indosat, Globe Philippines and AIS Thailand
- Leading all integration efforts for the Asia Pacific region, from requirements gathering, change request specification, development, testing, deployment & support
- Diagnosing of customer issues, identifying root cause, suggesting workarounds, managing the development and release of patches, as well as managing customer expectations. On-site visits when required
- Leasing between Engineering in our HQ in Ireland and Asia Pacific support
- Research and development to support ongoing product development, particularly for customers & initiatives in the European and US markets
- Maintaining & enhancing our build, automated test & Continuous Integration systems
- Functional Manager of Asia Pacific Engineering, one reporting Engineer
- MPOS Recommendation Engine – New features & performance optimizations
- Integration & billing interfaces for AIS, Indosat & Telcomsel
- Hutchison - Promotions, Recommendations & Capacity projects
- Integration work for Qualcomm Brew™ & Vodafone Europe

July 2005 – March 2007, Dublin, Ireland
Role: Senior Software Engineer / Solutions Architect

Responsibilities:

- Java development for our high-throughput messaging server (XIR)
- J2EE development on content management system, including some user interface changes
- Integration & acceptance testing with customers, such as the US bulk SMS provider Singlepoint

Major Projects:

- Redesigning & refactoring the Xiam Content Platform (XCP) backend
- XCP: Billing Interfaces: Design, development & maintenance
- Integrating Lucene search functionality with our CMS
- Hutchison Indonesia: Integration & billing interface

My older professional experiences:

Critical Path, Dublin, Ireland, March 2004 – July 2005

Adaptive Mobile Security, Dublin, Ireland, April 2003 – March 2004

Logica Mobile Networks, Dublin, Ireland, July 1999 – January 2002

New Product Introduction / Strategic R & D, July 1999 – June 2000

Aldiscon, Dublin, Ireland, February 1997 – September 1997