**Sandip Ray - Principal** **Architect (Cognizant)**

**Current Location:** Kolkata, India. **Preferred Location:** Kolkata, India

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**Git Repositories:** Available [here](https://github.com/sandipray63in)

**Experience Summary**

Having 17+ years of experience in Architecting, Designing, Implementing and Testing (Unit & Acceptance) of software for a variety of Domains like HealthCare, Retail, Banking, Non-Profit Organization and Government Organization.

Have been mainly playing the role of an Architect/Consultant, having demonstrated experience in-

* Requirements Analysis, Architecture/Design (Discussions & Thinking), Documentation[UML, ER etc]
* Pre-Sales activities like responding to RFIs/RFPs/RFQs(Doing Market Research & providing/documenting best/convincing strategic/tactical [OSS/build/buy] solutions to problems showing their tangible[e.g. long term] & intangible[e.g. short term] benefits along-with providing high level execution plan and ball-park effort/cost estimation and documenting assumptions, dependencies, risks, associated mitigation strategies, earlier accomplishments and if needed presenting small PoC demos also).
* Project Management(Roadmap Planning, Estimation, Iterative/Concurrent Scheduling/Tracking[assigning responsibility to team members and providing guidance/support when required], Iterative/Concurrent Execution[on schedule and to a high standard of quality] and Hiring)
* Agile Development/Testing Practices
* Developing Proof of Concepts & Design/Code reviews
* APIs and Frameworks development.
* Mentoring & Enabling varied teams across the organization and Knowledge Sharing Sessions with juniors/peers/seniors
* End to end Performance Tuning and Optimization using caching(in-memory & distributed), parallelism, asynchrony, streaming, compression, sql tuning, UI performance optimization techniques etc
* End to end Security Implementation along-with acquaintance of modern security practices like SAST, DAST, IAST & RASP
* Providing solution to fix ad-hoc technical issues (performance, security, design and code).

**Technical Experience**

* Experienced in System Design using on-premise infra and Cloud(AWS & Azure [Compute, Storage, Security, DBs, Containers & Orchestration, Serverless & AI/Cognitive services]).
* Conversant with Cloud Governance and Modernisation/Migration(7 ‘R’s).
* Conversant with 15 factor app & Application Modernisation using Microservices.
* Conversant with design/implementation/documentation/testing of NFRs like Reliability/Availability ,Performance, Scalability, Security, Regulatory Compliance, Resiliency,, Disaster Recovery, Cost Optimization, Operational Excellence, Sustainability etc.
* Conversant in C#/.NET & (core) Java. Having some nominal experience Python.
* Conversant in Object Oriented JS/TypeScript(including NodeJS) & Angular 2+. Having some nominal experience in React & Vue.js.
* Conversant with Object-Oriented/Functional/Multithreaded/Async/Parallel/Distributed/Meta/Event-Driven/ Aspect-Oriented Programming.
* Conversant with SOLID principles and patterns for Design(including DI/IoC using MS Unity/MEF), Application

Architecture, Integration, Micro-services & Cloud

* Hands-on experience in Web development(ASP.NET MVC/Webforms[including pipeline programming]).Proficient in Conversational AI(UI)/Chatbot(AWS Lex) & Contact Centre(AWS Connect), EDA(Event Driven Architecture), APIs & APIs Management, DDD, CQRS/ES, BPM(MS WWF), Business Rules Engine, IoT, Multi-tenant SaaS, DSL(Domain Specific Languages), Location-aware apps, Data/Service/UI Mashups, Batch Processing, Real time web[ASP.NET SignalR{long polling, server sent events, websocket} & ASP.NET WebHook], Synchronization Frameworks(MS Sync), ORMs[Entity Framework & Dapper], ADO.NET etc.
* Building Integration Solutions using DBs, Files, Middleware(Kafka/MQ), async/sync APIs based on Web/Micro Services(RPC/RESTful using WCF & ASP.NET Web API[including their pipeline programming]) & Web Pages(SSO based Nested/Cross App pages).
* Conversant in Distributed Systems/Computing(Cluster/Grid/P2P Computing).
* Adept in Data Engineering tools like Data Security(Apache Knox), Governance(Apache Atlas), Kappa Architecture([Batch Processing using Apache Spark/Hadoop & Real time Processing using Apache Flink), Data Warehouse(Apache Klyn/ AWS Redshift/ Azure Synapse), Data Orchestration(Apache Airflow), Data Quality(Great Expectations), Data Lake(Apache Iceberg/Apache Hudi / AWS S3/ Azure Blob storage), Data Visualization, Data LakeHouse, Data Catalog, Data Mesh etc. Also having fair amount of acquaintance/exposure to Apache Kafka, Apache Druid, AWS Batch, AWS Glue(Crawler + ETL + DB), AWS Athena, AWS Migration & Transfer Family(DataSync, Storage Gateway & Snow Family).
* Adept in AI/ML/DL using AWS AI Services/ Azure Cognitive Services & custom Distributed ML/DL(including Embeddings, Attention, Transformer Architecture) using Keras(Tensorflow) & Pytorch for unstructured data[text, speech, image & video), time-series & graph data using CPU/GPU/Quantum computers. Also adept in Enterprise GenAI. Also having some nominal knowledge/experience in Interpretable/Explainable AI, AutoML & Human in the loop ML.
* Experienced in both RDBMS(SQL Server, Oracle, MySql, PostGIS etc) and NoSql(Key-Value DB, Document DB, Column Family DB, Graph DB, Search DB, In-Memory DB & Vector DB).
* Adept at implementing PDD(Policy Driven Development) & TDD/BDD(MS Test, Moq, Fluent Assertions, Refactoring, Specflow)
* Adept in DevOps tools & practices(CI/CD pipeline tools[Jenkins/GitLab CICD/GitHub Actions], IaC[Terraform/CloudFormation], Docker (Compose & Registry), K8s, Istio, Helm, Configuration Management [Chef/Ansible], Powershell/Bash Scripting, Cake[C# Make] & Nexus. Also experienced in DevSecOps, MLOps & AIOps.
* Adept in SRE tools & practices like MELT(Metrics[SLIs, SLOs & SLAs], Events, Logs & Traces) for monitoring & alerting for Business Activity(including App Errors), Security, Performance(response time, throughput, resource consumption[CPU, RAM, SDD, HDD & Networks]), System Health for Servers/VMs/Containers/Apps using various Statistics & Sampling techniques using ELK stack. Also adept in Outage Management, Chaos Engineering, Incident Response & Post-mortem Analysis.
* Practical model driven Enterprise Architecture via documenting Motivation/Strategy, Business, Application, Technology, Integration & Data Architecture layers.
* Having some knowledge/experience in Diagnostic Analytics using Causal Inference & Discovery(DoWhy & EconML) & Prescriptive Analytics using Numerical/Reinforcement Learning/Evolutionary/Neuro-Fuzzy/Quantum based Optimization techniques.
* Having some nominal experience/theoretical knowledge of iPaaS, OTA(Over the Air) programming, Gamification, Game Theory, HPC, Edge/Fog Computing, Remote Sensing & GIS, Photogrammetry, RPA, Digital Twin & Blockchain/Web3.

**Work Experience**

**Cognizant (Kolkata)** Feb 2022 – till date

**Principal Architect**

Leading an ECM Batch Processing(20TB existing data & YoY 500 gb data upload) project wherein Big Data Engineering tools like AWS Batch(on Fargate), Glue(Crawler + ETL + DB) & Athena have been leveraged to implement various functionalities.

Involved in doing PoCs for Voice and Text based Chatbot & Contact Centre using AWS Lex and AWS Connect respectively. For Chatbots, mainly involved in PoCs of non-web channels like SMS, FB, Apple Business Chat, WhatsApp for Business etc. Also involved in the architecture/design/implementation of different functionalities related to Chatbot and Contact Centre(mainly used for live agents and IVR).

**Cognizant (Kolkata)** June 2019 – Jan 2022

**Senior Architect**

Involved in the migration of a .NET Remoting project to WCF and also involved in migrating some parts of the site from Flex to ASP.NET Webforms. Also driven performance tuning and end to end security implementation. Driven end to end DevOps implementation as well.

Involved in the requirements analysis, architecture, estimation, design, implementation, testing and deployment of various modules for a workflow-based project.

**Mindteck (Kolkata)** May 2018 – June 2019

**Technical Architect**

Remote Patient Monitoring – The project involved integration between devices (via which data could be sent to cloud) and a website (via which the data from cloud was monitored).

* Responsibilities - Was involved in the requirements analysis, architecture, estimation, design, implementation and testing related to the project. Was involved in handling of structured (time-series) data and unstructured (text, image, audio and video) data. Was responsible for benchmarking and maintaining NFRs like Performance, Security etc.
* Languages/Tools used: Most of the technologies mentioned in the skillset above.

**Tesco (Bangalore)** Dec 2016 – May 2018

**Senior Associate L2 (i.e. equivalent to Technical Lead/Associate Architect)**

Customer Service: Involved in Development, Enhancements, Support of various Enterprise Services (ASMX, WCF and Restful ASP.NET Web API based Services) and Batch File Systems related to Vouchers and Coupons processing for Tesco’s Ecommerce platform.

* Responsibilities – Have been responsible for the design/implementation/testing of a Vouchers Batch File Processing System re-write. Have developed ASMX, WCF and Restful Web API interceptors for different Enterprise Services’ needs. Was involved in the development of different enhancements within the Application scope
* Languages/Tools used: Most of the technologies mentioned in the skillset above. Learned BDD (SpecFlow), DevOps (Jenkins,/TeamCity, Chef etc.) and Agile Process.

Duration: Dec-2016 – May 2018

N.B. -> Tesco is one of Sapient’s premiere client.

**Sapient (Bangalore)** Sept 2015 – Dec 2016

**Senior Associate L2 (i.e. equivalent to Technical Lead/Associate Architect)** – Web Application

Sape Cloud: An internal Intranet site to manage VMs used by Sapient Employees.

* Responsibilities - Responsible for the Requirements Analysis, Estimation, Design, Development and Delivery of different enhancements within the scope of the Project. Also solved some existing Performance and Concurrency related issues.
* Languages/Tools used: HTML, JavaScript, JQuery, ASP.NET Web Forms, ADO.NET, C#.NET and MySQL.

Duration: Sept 2016 – Dec 2016

Before joining SapeCloud project, have been mainly in bench during this time because of shortage of projects. Got some opportunities but ultimately did not click, for varied reasons (e.g. one of the projects itself got on-hold). But in the meantime, went through some Trainings and worked on an IoT project viz. Physical Multifactor Authentication Project (using Raspberry Pi and Android App), for an IoT Bootcamp held by Sapient Nitro. Also worked on some PoCs with HTML5, CSS3, JavaScript, Angular.js, React.js and Node.js. **Have developed a Bidding/Auction Website using React.js and Node.js.**

**Cognizant Technology Solutions (Kolkata)** Jan 2010 to Oct 2015

As a **Technology Architect**, as part of Cognizant Banking and Financial Services Technology and Architecture Office, have worked on –

- Responding to an RFP for a SharePoint to .NET migration project.

- Responding to an RFQ for a classic ASP.NET to ASP.NET MVC migration

project. As part of the RFQ, did an E2E Use Case based Project Estimation.

- Responding to a part of RFP, which comprised of providing a VBA based solution to

automate some processes related to Excel Add-On Handling and Excel Integration with

different external data sources.

- Architectural Discovery and Assessment and then re-defining the Architecture for a

EAI project which consisted of integrating almost 20 disparate systems.

- Revamping an existing BPM solution to define a customized BPM solution, which had

custom Workflow Definition UIs (which had its own Event Driven Domain Language) which

was supposed to be used by Business users to define different types of Workflows and a separate

set of Windows Workflow Services corresponding to the Workflow Definitions.

**While in Cognizant, have also worked on the following (playing different roles) -**

**Technology Architect** – Web Application

Total Systems: A multilingual public facing Cards & Payments solution to submit expense reports and to process the related transactions for different clients of Total Systems.

* Responsibilities - Was responsible for the Requirements Analysis, Estimation, Design, Development and Delivery of different modules within the scope of the Project. Enabled the team to do proper Design, Development and Unit Testing of different modules. Also worked on Performance Tuning and Optimization on both Client and Server Side.
* Languages/Tools used: HTML, JavaScript, JQuery, ASP.NET MVC, ADO.NET, WCF, C#.NET and SQL Server 2010
* Duration: Apr 2015 – Oct 2015

**Technology Architect** – Web Application

Citibank: Developed a multilingual Customer Administration System solution, the data related to which was used by different other Citi Apps.

* Responsibilities - Was responsible for the Requirements Analysis, Estimation, Design, Development and Delivery of different modules within the scope of the Project. Understood the CITI UI and App Framework, then did some Pac’s, and then guided the team on the same along-with guiding the team on Client Side Best Practices, which ultimately led to the smooth execution of different modules within the system.
* Languages/Tools used: HTML, JavaScript, JQuery, CITI UI Framework (which is based on ASP.NET MVC), CITI Application Framework (which is based on the technologies viz. MEF, WCF, ADO.NET etc.),C#.NET, SQL Server 2010
* Duration: Aug 2014 – Apr 2015

**Technical Lead** – Business Process Management & Integration

Bank of New York Mellon: A Middleware solution for an intranet based Web application for a Fund Accounting System (post processing of Mutual Fund trades).

* Responsibilities - Was responsible for the Requirements Analysis, Design, Development and Delivery of different modules within the scope of the Project. Guided the team on good OOAD/OOP practices, Design Patterns, Domain Driven Design, SOA based Windows Workflow Services, TDD, Code Quality based on Client Architect feedback and earlier project experience, which led to smooth overall execution of the project. Designed and developed a Meta Programming (Reflection) based solution to make DI Container viz. MS Unity work with SQL Server wherein the Unity registrations were configured in the DB instead of a normal config file. Also designed and developed a wrapping framework over Entity Framework (version – 4.1) which could support Bulk Operations along-with normal operations (EF 4.1 & most of the other ORMs, by default, does not support Bulk Operations).
* Languages/Tools/Concepts used: IBM WebSphere MQ, Windows Service, WWF, HTML, JavaScript, JQuery, ASP.NET MVC, C#.NET, Entity Framework (Code First), Functional Programming, Concurrent Programming, Meta Programming, SQL Server 2010, TDD (MS Test, Moq, Fluent Assertions and Refactoring),
* Duration: Apr 2011 – Aug 2014

**Senior Developer** – Web Application

JPMorgan Chase: An intranet based Web application for a Mortgage System to be used by Underwriters and other back-end users for Loan Modification.

* Responsibilities - Was responsible for the Requirements Analysis, Design, Development and Delivery of different modules within the scope of the Project.
* Languages/Tools used: HTML, JavaScript, ASP.NET Web Forms, ADO.NET, VB.NET, Oracle 10g and Crystal Reports
* Duration: Jan 2010 – Mar 2011

**Ness Technologies (Mumbai)** Feb 2006 to Jan 2010

**Software Engineer** – Worked on various projects with responsibilities viz. requirement analysis, design, implementation and manual testing.

**Education**

**Amravati University**, Amravati, Maharashtra, India.

Bachelor of Engineering in Industrial Electronics, 2004

**Awards**

* 2nd Runners Up at Sapient Nitro IoT Bootcamp for the Physical Multifactor Authentication Project.
* “Smart Techie” and “Kudos” Awards by Cognizant Technology Solutions.
* “Kudos” Award by Ness Technologies.