

# Sandip Dey

## Email:

[sandip\\_dey@persistent.co.in](mailto:sandip_dey@persistent.co.in)  
[dsandip07@gmail.com](mailto:dsandip07@gmail.com)

**Mobile:** +91 9890452535

## LinkedIn:

[www.linkedin.com/in/dsandip](http://www.linkedin.com/in/dsandip)

## Objective

To grow as a technical architect, keep up to date with the latest technologies, execute time-bound challenging projects with quality delivery and customer satisfaction and contribute to organization's growth and success on a continuous basis.

## Career Summary

- 22+ Years of experience in software development using **GenAI, Cloud, IaC technologies**, Blockchain/DLT Technologies, Java/J2EE, NodeJS, Python, AWS Services.
- **Architected and developed proof-of-concepts, products, and solutions** in Cloud and IaC spaces, GenAI space, Blockchain based Self-Sovereign Identity, Blockchain based Financial Solutions, Integration between enterprise Ticketing/Asset Systems, Enterprise Identity/Access Management, Team Collaboration and Application Life Cycle Management domains.
- Architected, Designed and Jump-started projects in potentially new domains and technologies on a continuous basis.
- Managed many small and medium sized teams of leads and developers.

## Educational Qualification

- *MSc (E) degree in Computer Sc. And Automation* from Indian Institute of Science (IISc), INDIA, July 2000 - Dec. 2002, Research Area: Theory of Distributed Systems. Research Topic: Fault-Tolerant Ring re-configuration Algorithms.
- *Bachelor of Engineering (Computer Science)* degree from Bengal Engineering College (Now known as IEST, Shibpur), INDIA, July 1995 – June 1999, Overall Percentage: 81%

## Work Experience

**22+ Years**

### Current

- Organization : **Persistent Systems Limited**
- Current Designation : **Principal Architect**
- Joined As : Member of Technical Staff
- Duration : 10<sup>th</sup> Feb 2003 till date

## Previous

- Organization : Computer Science and Technology Department, Bengal Engineering College
- Designation : Research Associate
- Joined as : Research Associate
- Duration : July 1999 to Jan 2000

## Technical Profile

- Domains and Technologies: Cloud (AWS) services and technologies, IaC/Terraform, GenAI technologies, Workflow automation (Apache Airflow), Distributed Ledger Technologies (DLT), Blockchain based Self-Sovereign Identity Management, Blockchain enabled Financial Services, Enterprise Identity/Access Management, Application Lifecycle Management, Machine Learning Fundamentals.
- Languages: Python, Terraform, Java/J2EE Stack, NodeJS
- Cloud/AWS Skills: AWS services, architectural patterns, and best practices in depth. Reasonable exposure to Azure and GCP as well.
- GenAI skills: LLMs, RAG, Langchain, Vector DBs, Agentic Tooling

## Academic/Research Papers and Publications

- Sandip Dey: **Solving Classic Problems in Distributed Systems: The Smart-Message Paradigm** in the proceedings of *Distributed Computing and Networking, 9th International Conference, ICDCN 2008*, pp.170-175, Lecture Notes in Computer Science 4904 Springer 2008, ISBN 978-3-540-77443-3
- Sandip Dey, Arindam Pal: **A Token-Based Distributed Algorithm for Total Order Atomic Broadcast** in the proceedings of *Distributed Computing, Mobile and Wireless Computing, 4th International Workshop, IWDC 2002*, pp.343-347, Lecture Notes in Computer Science 2571 Springer 2002, ISBN 3-540-00355-X
- R. C. Hansdah, Nilanjan Gantait, Sandip Dey: **A Fault-Tolerant Distributed Deadlock Detection Algorithm** in the proceedings of *Distributed Computing, Mobile and Wireless Computing, 4th International Workshop, IWDC 2002*, pp.78-87, Lecture Notes in Computer Science 2571 Springer 2002, ISBN 3-540-00355-X

## Projects

### Domain(s)

Cloud Technologies (primarily AWS), IaC/Terraform, GenAI technologies and LLMs, Blockchain-based Self-Sovereign Identity management, Blockchain-based Financial Applications, Enterprise Identity/Access Management, Team Collaboration and Application Life Cycle Management

### 1. Organization: **Persistent Systems Limited**

Projects are listed below in reverse chronological order. Ongoing projects are marked in \*.

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<b>Project Title</b>	: AI Research for SASVA
Scope of the Project	: One aspect of the project was to compare SASVA against other GenAI tools on various parameters to provide an objective assessment on what new features/capabilities can be beneficial for SASVA. We also did a study comparing SASVA with other similar offerings from various other companies with GenAI offerings in SDLC space. The other important contribution was to implement a test harness framework (for various use cases like requirement gathering, code documentation, test case generation etc.) where we programmatically evaluated output of SASVAs LLMs against output of various other open-source LLMs using a separate LLM as a judge. The entire framework was automated as well using Apache Airflow.
Duration	: 3 Months
Team Size	: 4
Role/Responsibilities	: Architect, Individual Contributor
Software	: GenAI Technologies – Commercial and open-source LLMs and
Tools/Technologies	: APIs, Evidently AI, Ollama, LiteLLM, Apache Airflow for workflow automation, Python, REST API

<b>Project Title</b>	: Persistent Intelligent Cloud (PiCloud) and Persistent Cloud Automation Stack (PiCAS)
Scope of the Project	: PiCloud is a GenAI driven cloud accelerator, a visual Low Code No Code tool that can help users and organizations build their cloud infrastructure rapidly with no coding. The entire process is prompt driven and visual. Users get deployable Terraform code (IaC) in the end. PiCAS is a repository of reusable, composable and battle-hardened Terraform modules for all the three major hyperscalers: AWS, Azure and GCP.
Duration	: 2.7 Yrs
Team Size	: 10-15
Role/Responsibilities	: Architect, Developer
Software	: Cloud services (including AWS), GenAI technologies and LLMs,
Tools/Technologies	: Terraform, Python, ReactJS, Docker, Kubernetes, Shell scripting

**Project Title** : Cloud and Edge Computing Accelerators and Architectural patterns  
**Scope of the Project** : R & D type project, where I had architected and developed several architectural patterns (using AWS services) for various Cloud and Edge computing use cases. These patterns had code and white papers as deliverables. Infrastructure as Code (IaC) technologies like AWS CloudFormation and Terraform were used actively.  
**Duration** : 2.5 Yrs  
**Team Size** : 3-4  
**Role/Responsibilities** : Architect, Mentor, Developer  
**Software** : AWS Services including Edge-computing related services, AWS  
**Tools/Technologies** : CDK, Python, Node JS, Terraform

**Project Title** : R3 Corda based CorDapps for Financial Domain  
**Scope of the Project** : Develop CorDapps for various problems and use cases in the financial services domain. Corda is an exciting blockchain platform which differs in many aspects from a traditional DLT (Distributed Ledger Technology) blockchain like Ethereum or Hyperledger Fabric and is targeted specifically for regulated financial entities. I have worked on a Loan Application PoC CorDapp which facilitates interactions and transactions between an Agency (acting on behalf of loan applicants), a Bank (which provides loans to applicants) and a Credit-Rating Agency (which helps the Bank decide on loan eligibility based on user's credit score or profile).  
 Additionally, work on customer responses.

**Duration** : 6 Months +  
**Team Size** : 1  
**Role/Responsibilities** : Architect/Developer  
**Software** : Java 8, Kotlin 1.3, R3 Corda, H2 Database, Spring Boot, REST API,  
**Tools/Technologies** : IntelliJ IDEA, Gradle.

**Project Title** : Blockchain based Self-Sovereign Identity Solution (as Persistent IP)  
**Scope of the Project** : Blockchain based identities are inherently *decentralized* and *self-sovereign*, enabling users to be in control of their own identities and share elements of these identities with relying parties on a selective need to know basis. For this project, we have used a permissioned Quorum network as the underlying Blockchain network. The Identity Solution is built on top of uPort which can be deployed very easily on an Ethereum type network like Quorum. The backend also includes a private IPFS (Inter Planetary File System) cluster that is used in conjunction with the Quorum network to create decentralized

identities for users and applications. IPFS at its core is a Distributed File and Document system that provides replication and fault-tolerance.

*Our IP solution* supports the fundamental identity workflows of identity registration and creation of user identity wallet, issuance of claims/attestations by an issuing party and presentation of an identity attestation to a relying party for verification. The User Experience piece is provided via a cross-platform Mobile App which manages a user's identity and attestations received from various Issuing parties e.g. A Driving License Authority. These issuing and replying parties are Distributed apps having their own application identities and are participants in the blockchain network.

We have added number of User Centric features as value additions on top of the basic identity workflows. Some of these include Selective disclosure of attestation data to a relying party, Mnemonic based Identity recovery in case a user loses his mobile and therefore his identity wallet, Attestation Backup/Recovery function which persists a user's attestations securely in encrypted form in IPFS, Push notification support for better UX etc.

I have also worked on a Blockchain-based Resident Identity RFP for Ohio Dublin City where we had planned to use our self-sovereign identity solution to address their identity, user voting and user survey use cases.

Duration	: 2 Yrs +
Team Size	: 2
Role/Responsibilities	: SME/Architect/Developer
Software	: Ethereum/Quorum, Solidity, Truffle Framework, IPFS, uPort,
Tools/Technologies	: Node.js 8.9/NPM, Docker/Docker-Compose, Java 8/Android Studio, Ionic 3/Angular 5 for Mobile app, Angular/NodeJS for issuer/verifier Distributed apps, AWS Lambda, AWS API Gateway, AWS DynamoDB, SES, SNS, AWS Cloud Watch, Serverless

<b>Project Title</b>	: Integration Services
Scope of the Project	: Architecting/Designing an integration between two Ticketing Systems. Customers would typically have number of disparate Ticketing/Asset Management Systems like IBM SCCD/Maximo, IBM ISS Remedy, TADDM etc. An integration solution between two such systems will typically involve designing a bi-directional bridge (written using Java, Webservices, XML) where Ticket Create/Update can flow in both directions. Addressed many such integration requirements in the Incident/Change/SR management domains for multiple customers.

Duration : 24 Months.  
 Team Size : 4-6  
 Role/Responsibilities : Integration Services Architect responsible for all architecture/design decisions, customer communication, UAT/Prod Testing and end-to-end delivery of the integration solution  
 Software : Various IBM Ticketing/Asset management systems like IBM  
 Tools/Technologies : SCCD/Maximo 7.5, IBM ISS Remedy, CMS, ServiceNow, TADDM, Java/Webservices/WSDL, XML, DB Technologies.

**Project Title** : Global Identity and Access Management R7 / R5  
 Scope of the Project : Global Identity and Access Management (GIAM) is a customized offering built on top of Tivoli Identity Manager. The scope of the project includes work in self-service user interface area, shared ID management capabilities and workflow management functions.

Duration : 36 Months  
 Team Size : 9-10  
 Role/Responsibilities : Technical Architect.  
 Software : IBM Tivoli Identity Manager, Global Identity and Access  
 Tools/Technologies : Management R7/R5, Rational Software Architect, Rational Team Concert, Core Java, J2EE, XML, Presentation layer technologies

**Project Title** : IBM Security Identity Manager/Privileged Identity Manager 6.0  
 Scope of the Project : Development of ISIM/PIM Web services layer, Development of Shared ID Management functions, Development of Reports functionality for Shared ID management, Test Automation for ISIM/PIM Web services API, Test Automation for Build Verification functions, accessibility Test for ISIM/PIM UI Panels, System Verification and Upgrade Testing for ISIM/PIM.

Duration : 22 Months  
 Team Size : 9-10  
 Role/Responsibilities : Technical Architect.  
 Software : ISIM, Rational Application Developer, Core Java, J2EE, HTML,  
 Tools/Technologies : Framework for Integrated Tests, Java Web Services.

**Project Title** : Integration Solution between Rational DOORS and HP Quality Center  
 Scope of the Project : Architecture and design suggestions of an integration bridge between two quality management tools – Rational DOORS and HP Quality Center.

Rational DOORS is a leading requirements management product from IBM. HP Quality center is a comprehensive test and quality management solution from HP. The project was about coming up with an integration solution between the two tools that will support synchronization of requirements from DOORS to HP Quality Center and synchronization of test cases and defects from Quality Center to DOORS. There were many performance requirements that needed to

be addressed like supporting many high-volume synchronization tasks in parallel. The team suggested a flexible integration architecture that was scalable, did several performance tests, wrote a performance tuning whitepaper for existing customers and suggested prototypes for the proposed solution.

Duration : 4 Months  
 Team Size : 4  
 Role/Responsibilities : Technical Architect and Team Manager.  
 Software : Rational DOORS 9.3, HP Quality Center 10.0, Core Java, DOORS  
 Tools/Technologies : extension language (DXL) for accessing DOORS data, VB Scripts and Object Test Architecture APIs for accessing HP QC data.

**Project Title** : Role and Policy Modeler (RaPM) Reporting  
**Scope of the Project** : Role and Policy Modeler (RaPM) is a new IBM product to be shipped along with IBM Security and Identity Manager (ISIM 6.0). Customers will export role, identity, policy and Separation of Duty constraints related data from ISIM. This exported data will be imported into RaPM, and the customer can then model the roles and policies required by the organization. Once the customer is satisfied with the Role/Policy structure, the same will be exported back to ISIM.

RaPM uses IBM Cognos as the reporting engine. As part of this project, we have developed three complex reports to provide insights into RaPM data.

1. Roles report: This report has Role Owner as the central entity. The report shows Role related details for all the roles (including relationships with other roles) associated with the selected Role Owners.
2. User Access report: This report has User as the central entity. This report shows the various permissions associated with a User and shows how they are associated (directly or indirectly via role memberships).
3. Operations report: The RaPM data store has couple of logical databases in it – The Staging DB and the Identity and Entitlements DB. The Role engineer and IT specialist use the Source report to view the filtered sets of data grouped by the source where the attributes are originated. For example, the customer will want to see all the identity records for a user sorted by the source and the source record. This is true for all object types and both databases (Staging DB and the Identity and Entitlements DB).

Duration	: 5 Months
Team Size	: 2-3
Role/Responsibilities	: Project Tracking and providing technical inputs
Software	: RaPM, Rational Application Developer, IBM Cognos Reporting
Tools/Technologies	: Studio, DB2

<b>Project Title</b>	: HP Tool Adapters for Rational Quality Manager
Scope of the Project	: Design, development, functional, system testing and documentation of Quick Test Professional and LoadRunner Tool Adapters for Rational Quality Manager v 1.x, v 2.x.

The QTP and LoadRunner adapters are integration solutions between the Mercury products and Rational Quality Manager. Rational Quality Manager is fast becoming a comprehensive test plan and lifecycle management product (like HP Quality Center). Using these adapters, a user can import QTP scripts and LoadRunner scenarios into Rational Quality Manager. They can also execute these scripts and scenarios from within RQM and view logs and results. The team was engaged in design, development, testing and documentation of these adapters.

Duration	: Initial development of about 2.5 months plus ongoing support and new releases work.
Team Size	: 3
Role/Responsibilities	: Technical Architect and Manager/Designer/Implementer/Tester.
Software	: Eclipse, Rational Quality Manager, HP QTP 9.x and LoadRunner 9.1
Tools/Technologies	: Tool knowledge, Java, REST architecture, XML/XSL knowledge, VB scripting.

<b>Project Title</b>	: Rational Insight Adapter for HP Quality Center
Scope of the Project	: Design, development, functional, system, globalization testing and documentation for Rational Insight Adapter for HP Quality Center 10.0.

Rational Insight is the newest product from Rational in the Enterprise reporting arena - it produces live operational as well as trend reports using DB2 Datawarehouse and Cognos BI engine. HP Quality Center emerged as one of the end points for enterprise reporting and thus Persistent emerged as a business partner to develop a Data services adapter that can pull test artifacts and other quality related data from HP QC using REST based webservices and then Rational Insight can use this info for storage in DW and subsequent reporting. We designed, developed, and tested this adapter.



Duration : 3 Months of development plus ongoing support.  
 Team Size : 2  
 Role/Responsibilities : Technical Architect and Manager/Designer/Implementer/Tester.  
 Software : Java, XML, REST architecture, Eclipse plugin development, Java-COM Bridge Technology, VB scripting, XDC, Rational Insight Data Manager and Framework Manager technologies. We did functional, globalization mock and system level testing as well - Manual test methods were used. For documentation, we used IBM DITA technology and ArborText EPIC editors.

**Project Title** : IBM Tivoli Identity Manager 5.1  
**Scope of the Project** : Development of test automation framework using Framework for Integrated Tests (FIT), writing test cases using FIT and Rational Functional Tester, defect fixing work in TIM API layer, implementation work in TIM Reporting module, Component/System Verification Test for TIM.

Duration : 14 Months  
 Team Size : 4  
 Role/Responsibilities : Developer/Tester/Lead for work items mentioned above.  
 Software : Core Java, J2EE, HTML, RFT  
 Tools/Technologies

**Project Title** : IBM Tivoli Identity Manager 5.0 Reporting Engine  
**Scope of the Project** : Development of Reporting Engine for TIM 5.0  
 Duration : 20 Months  
 Team Size : 4  
 Role/Responsibilities : Component owner and Designer/Technical Lead of TIM 5.0 Reporting Engine. Had people management and mentoring responsibilities as well.  
 Software : J2EE/TIM Reporting Technologies, JDBC, JNDI, Apache FOP  
 Tools/Technologies

**Project Title** : Tivoli Identity Manager 5.0 UI and Other Server-side Development  
**Scope of the Project** : Development of TIM 5.0 UI and other server-side Line Items  
 Duration : 18 Months  
 Team Size : 7  
 Role/Responsibilities : Technical Lead of UI and other server-side work efforts. Led and managed the team during this project. Had people management and mentoring responsibilities as well.  
 Software : J2EE, IBM Presentation Services/Web Component Library and Web  
 Tools/Technologies Technologies like JSP, JS

**Project Title** : IBM Global Services Self service UI and Adapters Development  
**Scope of the Project** : Development of TIM Self-service UI for end-user and manager persona. Development of Adapters as required by IBM Global Services.  
**Duration** : 8 Months  
**Team Size** : 7  
**Role/Responsibilities** : Providing technical and managerial bandwidth to manage these projects from PSPL side.  
**Software** : J2EE, Struts, Tivoli Directory Integrator and IBM Adapter  
**Tools/Technologies** Technologies

**Project Title** : Various offshore Professional Services Projects  
**Scope of the Project** : This includes providing technical inputs to various offshore professional services projects going on at that time. Partners included: Watson SCS, PMUSA, WellPoint, ING for some time  
**Duration** : 6 Months  
**Team Size** : 5-6  
**Role/Responsibilities** : Technical Management/Providing technical inputs to these projects from PSPL side. Did not have any organizational/people management responsibilities here.  
**Software** : J2EE, Tivoli Identity Manager, Tivoli Directory Integrator  
**Tools/Technologies**

**Project Title** : IBM Tivoli Identity Manager XML Gateway Development  
**Scope of the Project** : Development of an XML-based Gateway for TIM. Custom applications can send requests to TIM using this Gateway. Requests and responses are presented in XML.  
**Duration** : 4 Months.  
**Team Size** : 3  
**Role/Responsibilities** : Providing technical/design inputs to manage this project from PSPL side. I did not have any people management responsibilities here.  
**Software** : J2EE, TIM APIs, XML, HTTP.  
**Tools/Technologies**

**Project Title** : IBM HESTIA v1.0 Reporting Component Development  
**Scope of the Project** : IBM HESTIA/IBM TIM Entry was being targeted for the security compliance market. Reporting is an important component in this product. Did investigation and prototyping.  
**Duration** : 2 Months  
**Team Size** : 2  
**Role/Responsibilities** : Designer/Developer for HESTIA Reporting Engine  
**Software** : J2EE/DB2/TIM Express Reporting Technologies  
**Tools/Technologies**

**Project Title** : Reporting Backend Development for IBM Tivoli Identity Manager Express 4.6 Edition

Scope of the Project : Developing and Supporting reporting backend functionalities for TIM Express 4.6

Duration : 8 Months

Team Size : 2

Role/Responsibilities : Tech Lead and the Component Owner for TIM Express Reporting Engine. Lead a team of two.

Software : J2EE and ITIM Enterprise technologies

Tools/Technologies

**Project Title** : UI Defect Fixing for Tivoli Identity Manager Express 4.6 Edition

Scope of the Project : Fixing functional defects in Tivoli Identity Manager Express 4.6, before release

Duration : 5 Months

Team Size : 3

Role/Responsibilities : Lead for this effort and provided technical inputs to others as required

Software Tools/Technologies : J2EE and ITIM technologies

**Project Title** : Reporting Engine for IBM Tivoli Identity Manager 4.6 Enterprise Edition

Scope of the Project : Development of Reporting Engine for 4.6

Duration : 17 months

Team Size : 4

Role/Responsibilities : Developer and Tech Lead: Development of Data Synchronization and Incremental Data Synchronization Component, Development of Report Generation Module.

Software : Java/J2EE

Tools/Technologies

**Project Title** : Novell DirXML Based Driver development for Report Incremental Data Synchronizer

Scope of the Project : Developed a change-log driver for Novell e-directory. Novell e-directory does not have built-in change-log feature like other LDAP directory servers. This driver was required for Incremental Data Synchronizer, which is a synchronization mechanism available in TIM Reporting Engine.

Duration : 2 months

Team Size : 1

Role/Responsibilities : Developer

Software : Novell DirXML framework, LDAP concepts, DOM/XML, Java

Tools/Technologies

**Project Title** : IBM Tivoli Identity Manager Level 3 Support  
**Scope of the Project** : Supporting Level 3 issues in enRole 4.3, enRole 4.4 and ITIM Enterprise 4.5  
**Duration** : 10 months  
**Team Size** : 9  
**Role/Responsibilities** : As a team member, I supported L3 issues and resolved many important issues with a good turn-around rate.  
**Software** : Java/J2EE, IBM TIM Technologies  
**Tools/Technologies**

2. Institute/Organization: **Computer Science and Technology Department, Bengal Engineering College**

**Project Title** : Applications of Cellular Automata Theory  
**Scope of the Project** : Modeling properties of a protein chain using cellular automata theory  
**Duration** : 6 Months (July 1999 to Jan 2000)  
**Team Size** : 1  
**Role/Responsibilities** : Research Associate  
**Software** : Cellular Automata Theory, C  
**Tools/Technologies**

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