

A Mindtree initiative with one of the pioneering Cloud based Enterprise API platforms for multi-livelihood domains



Client Overview

Mindtree.org believes in making digital technology and professional services accessible to millions working in India's informal sector. The platform works with government agencies, social businesses, donors, impact investors and citizen groups to co-create inclusive eco-systems. These consist of vibrant marketplaces, networked communities, scalable micro-businesses and social security. Open access digital platform offers a host

of domain solutions for all eco-system stakeholders. These solutions come together to create integrated and scalable socio-economic transformations.

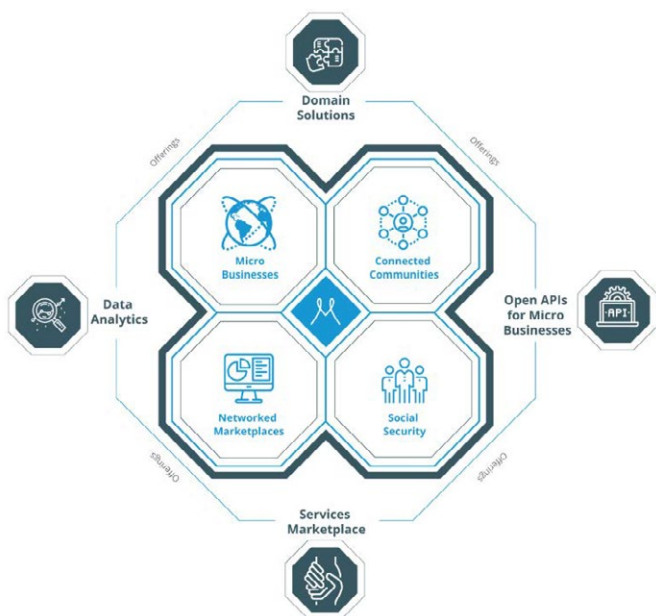
Business Challenges

The challenge was to simplify waste management and transform the livelihood of waste pickers. Here, there was a need to build a Livelihood Platform, not just an Application System for Waste/Ragpickers which led us to come with a solution called **I Got Garbage**. The solution required a strong connect between the ecosystem that included waste generators (house/apartment), collectors and buyers. It required to have a solution with micro-services based architecture for multi-tenancy platform which can handle unpredictable workloads. Also, agile in nature with continuous integration and deployment, which is essential for incremental updates.

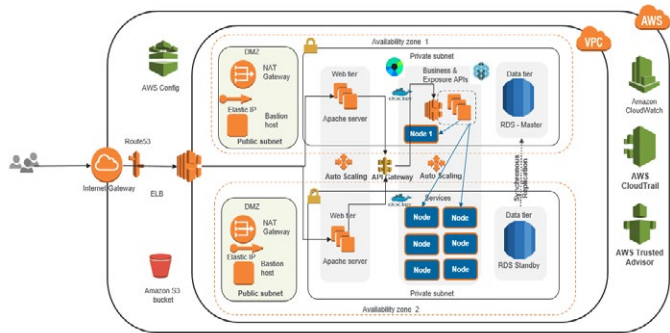
Mindtree's Solution

Mindtree's I Got Garbage provided an easy and one click script-driven setups for whole environment using cloud formation. Mindtree developed a cloud-based micro-services style architecture, leveraging on-demand scalability and high availability.

Micro-services architectural style is adopted with containerized deployment using DC/OS Mesos marathon orchestrator and Docker containers with Automated DevOps pipeline for continuous integration and delivery.



To provide them with efficient performance and value for money, we opted for an AWS Trusted Advisor. This helped us to stand by our promise of providing the best resource at optimized costs. Not only this, Mindtree could now focus on performance including providing fault-tolerance.



On the security front, Mindtree was able to ensure security of resources using the access provided by the AWS Trusted Advisor. This included access to specific ports having unrestricted data, IAM user data, MFA on Root Account and service limits. Also, protection of root account credentials are considered as first priority.

We created fine grained permissions to resources under AWS account, applied them to groups and then assigned users to those groups using AWS IAM and ensured users have least privilege to accomplish tasks.

The entire security setup is inside a Virtual Private Network with limited and need-based ingress and egress to ensure high security. Firewall rules and more realistic server environment have also been setup. Data is secured at rest and transit in RDS.

The platform includes CloudWatch which helps in continuous monitoring, collect metrics and log files. It also enables tracking of the collected metrics, setting alarms and making changes whenever required.

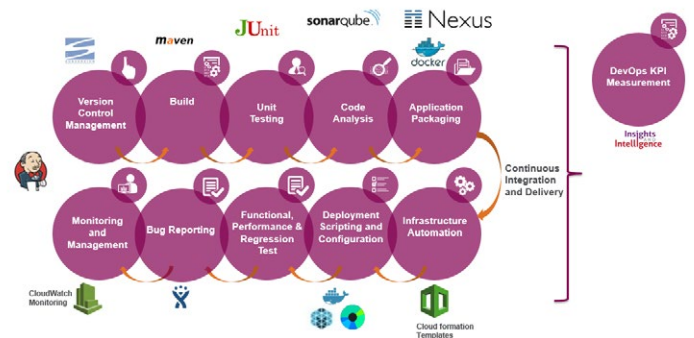
The cloud trail has helped to administrate and control AWS account. As a result, Mindtree has been able to further log, monitor and retrospect activities across the client's infrastructure. All the AWS resources are checked for compliance using AWS Config.

Automated DevOps Pipeline

Automated DevOps pipeline is setup with series of steps in DevOps life cycle for continuous integration, deployment, testing, monitoring, feedback and planning. CI includes automating builds, unit tests, and packaging processes while CD helps with the application delivery pipeline across different environments. CI and CD

accelerate the application development process through automation across different phases, such as build, test, and code analysis, and enable users to re-plan to close the feedback loop.

Jenkins is used as continuous integration and delivery tool. The code is maintained in sub version source control which is built using Maven upon on-demand/automated build and environment request. Unit testing is an integral part of DevOps life cycle and the code is unit tested with JUnit. SonarCube helps with static code analysis and generates reports for feedback on code quality. Docker images are generated and stored in Nexus repository. AWS Cloud formation templates are used for automated infrastructure provisioning and shell scripts for Mesos/



marathon orchestration configuration and Docker configuration. The Docker images are retrieved from Nexus repository and deployed in AWS EC2 instances. The code is tested and bugs are recorded in JIRA. The code quality, build health checks are constantly measured as KPI and dashboard is available as part of Insights and Intelligence framework from Mindtree. The whole infrastructure is monitored continuously with CloudWatch and auto-scaling configurations in place to replace unhealthy instances.

Business Benefits

- Leveraged elastic capacity for unpredictable workloads which was a quintessential need
- Provided compute and all-time data availability which is of utmost importance
- Security isolation across environments was critical and maintained
- Growing binary assets required elastic content storage which was provided as per growth expansion in mind
- Scaling out as per the demand spike was also considered
- Agility for incremental updates was accommodated
- Resulted in less administration overhead

The 2017 State of the SaaS-Powered Workplace Report: <https://www.bettercloud.com/monitor/state-of-the-saas-powered-workplace-report/>

ABOUT MINDTREE

Mindtree [NSE: MINDTREE] delivers digital transformation and technology services from ideation to execution, enabling Global 2000 clients to outperform the competition. "Born digital," Mindtree takes an agile, collaborative approach to creating customized solutions across the digital value chain. At the same time, our deep expertise in infrastructure and applications management helps optimize your IT into a strategic asset. Whether you need to differentiate your company, reinvent business functions or accelerate revenue growth, we can get you there. Visit www.mindtree.com to learn more.