Labourer Management System Pune, India 22 June 2020 Capgemini

Business Problem Statement



Today in India around 90 to 95% of people are employed in unorganized sector, which produces 50% of the country's GDP

These labourers involved in unorganized sector are mostly daily wagers who earn their livelihood by daily wages

Their employment terms are not fixed and regular as well as the enterprises employing them are not registered with the government

Recent Corona virus pandemic has highlighted the plea of these labourers who mostly immigrate from different states in India

The need of the hours is to build a platform to manage the employment of unorganized sector and provide them with the benefits of assured minimum wages and medicare

Business Solution Outline



This application will onboard the migrant labourers on to a single platform. This application can be built and owned by government e.g. UP Government

The businesses in need of labourer can register to this portal and request for labourer

A legal contract will be created between the labourer and the business entity detailing labour benefits (similar to an employment offer letter)

Labour laws can be enforced for this contract

This application can be integrated with Aadhar and other government schemes to implement social security benefits for the labourer

Reports can be generated for the employment status for the migrant labourer as so on

Solution Benefits



This application will help move the labourer who are currently in unorganized sector to an organized sector

Create a legal employment agreement between the business and the labourer, which can act as single source of truth

Ensure social security for the migrant labourer

Integrate the application with local employment exchanges and improves employment

Integrate with other government systems to provide other benefits to the labourer

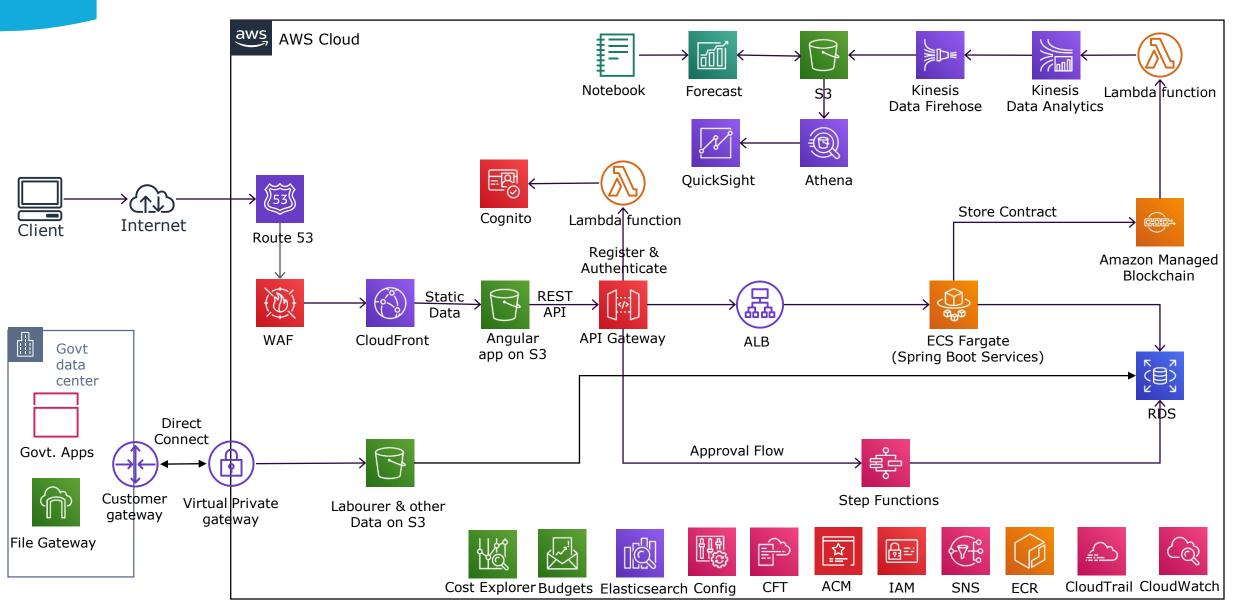
AWS Services Used



API Gateway	WAF
ALB	CloudTrail
ECS Fargate	Elasticsearch
Amazon RDS – mySQL	Config
Step Function	CloudFormation Template (CFT)
S3	IAM
Cognito	ECR
Lambda	Cost Explorer
CloudWatch	Budgets
SNS	
ACM	
Amazon ECR	
Route 53	

Architecture Diagram





Technical Solution Outline

- 1. Labourer and other data is loaded from the Govt On-prem applications using File Gateway over a Direct connect connection
- 2. Angular application deployed on S3 as a hosted website frontended by CloudFront
- 3. Spring boot microservices deployed on ECS Fargate Frontended by ALB and exposed over API Gateway
- 4. Microservice orchestration for Approval flow done using Step Functions
- 5. Database hosted on Amazon RDS mySQL with backups on S3
- 6. Contract between Employer and Labourer stored on Amazon managed Blockchain
- 7. Analytics and dashboard done using Kinesis, Athena & QuickSight
- 8. Labourer Forecasting done using Amazon Forecast
- 9. Integration via Direct Connect with other Govt apps like Aadhar, PPF for employee benefits
- 10. Custom Lambda functions create the application users in Cognito User Pools and authenticate the user

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Solution adheres to AWS Well Architected Framework



1. Operational Excellence Pillar:

- a. Solution will use CloudFormation Templates based on best practices
- **b. Prepare:** AWS Config and AWS Config rules will be used to create standards and to determine if environments are compliant with those standards before being put into production
- c. Operate: CloudWatch will be used to monitor the operational health of the application
- d. Evolve: Elasticsearch Service will be used to analyze the log data to gain actionable insights quickly and securely

Solution adheres to AWS Well Architected Framework



2. Security Pillar:

- **a. Identity and Access Management:** IAM is used to enable securely control access to AWS services and resources
- **b. Detective Controls:** AWS CloudTrail records AWS API calls, AWS Config provides a detailed inventory of the AWS resources and configuration
- c. Infrastructure Protection: Amazon VPC enables to launch AWS resources into a virtual network. AWS WAF protects the web application from common web exploits
- **d. Data Protection:** Data on ALB, S3, Amazon RDS is encrypted in transit and rest
- **e. Incident Response:** IAM is used to grant appropriate authorization to incident response teams and response tools. AWS CloudFormation can be used to create a trusted environment for conducting investigations. Amazon CloudWatch Events allows to create rules that trigger automated responses including AWS Lambda

Solution adheres to AWS Well Architected Framework



3. Reliability Pillar:

- a. Amazon CloudWatch monitors runtime metrics and is essential to Reliability
- **b. Foundations:** AWS IAM enables to securely control access to AWS services and resources. Amazon VPC provisions a private, isolated section of the AWS Cloud where the AWS resources are launched in a virtual network
- **c. Change Management:** AWS CloudTrail records AWS API calls for the account and delivers log files for auditing. AWS Config provides a detailed inventory of the AWS resources and configuration, and continuously records configuration changes. Amazon CloudWatch provides the ability to alert on metrics, including custom metrics
- **d. Failure Management:** AWS CloudFormation provides templates for the creation of AWS resources and provisions them in an orderly and predictable fashion. Amazon S3 provides a highly durable service to keep RDS backups

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4. Performance Efficiency Pillar:

- a. Amazon CloudWatch which monitors the resources and systems, provides visibility into the overall performance and operational health
- **b. Selection:** Amazon RDS provides a wide range of database features (such as PIOPS and read replicas) that allow to optimize the application
- c. Monitoring: Amazon CloudWatch provides metrics, alarms, and notifications that can be used with AWS Lambda to trigger actions
- **d. Tradeoffs:** Amazon CloudFront allow to improve performance

Solution adheres to AWS Well Architected Framework

5. Cost Optimization Pillar:

- a. Cost Explorer helps to gain visibility and insights into the usage, across the workloads of the application
- **b. Expenditure Awareness:** AWS Cost Explorer allows to view and track the usage in detail. AWS Budgets notify if the usage or spend exceeds actual or forecast budgeted amounts
- **c. Cost-Effective Resources:** Amazon CloudWatch helps to right size the resources. AWS Direct Connect and Amazon CloudFront is used to optimize data transfer



8 Source Code



Located in below Git Repository

FrontEnd: https://github.com/sailesh1848/organizing-labor-sector/tree/frontend

BackEnd : https://github.com/sailesh1848/organizing-labor-sector/tree/backend

SQL: https://github.com/sailesh1848/organizing-labor-sector/tree/sql

Data Elements



See Attached >

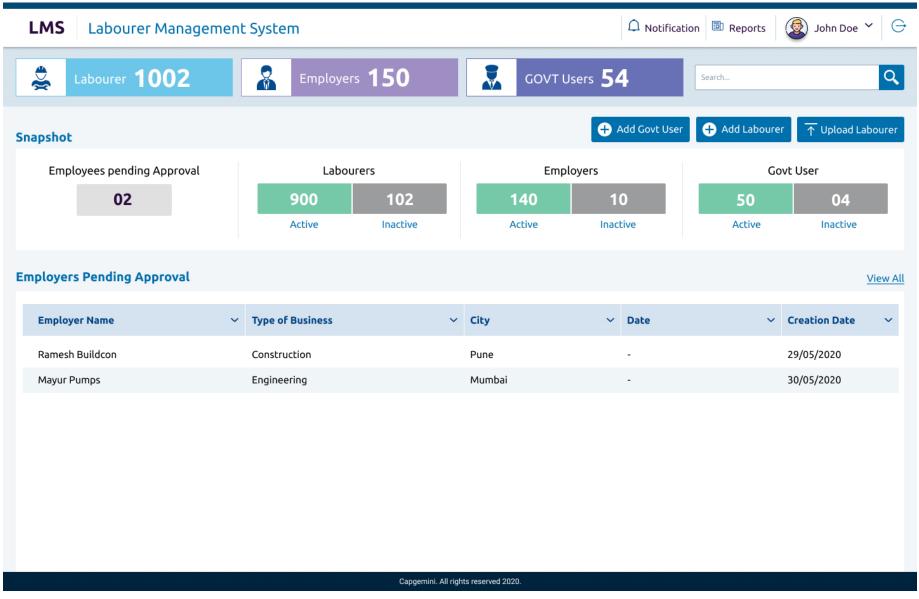


Microsoft Excel Worksheet

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10 Sample UX Design – Admin Dashboard





10 Sample UX Design – Register New Employer



LMS Labourer Manage	ement System		○ Notification	Reports	John Doe 🗸	\ominus
Register New Employer Employer Name						
Address	City	State	Pincode			
Contact Name	Contact Name	Type of Business	~			
Tan No.	Registration No.					
					Submi	t
	Capge	mini. All rights reserved 2020.				

10 Sample UX Design - Approve Employer



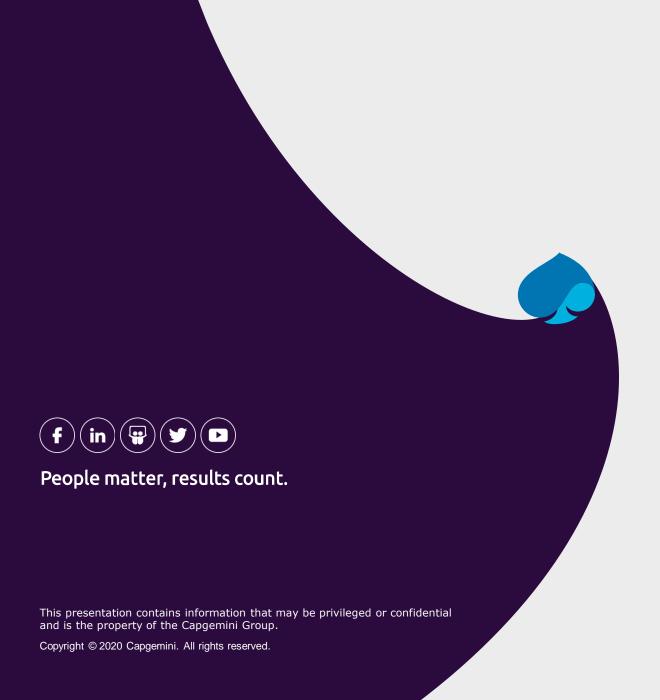
LMS Labourer Manageme	ent System		☐ Notification ☐ Reports	John Doe ✓
Register New Employer Employer Name Ramesh Buildcon Address 123, TATA Enclave, KoregaonPark	City Pune	State Maharashatra	Pincode 411027	
Contact Name Ramesh Shet Tan No. 123ABC789A	Contact Name 123456789 Registration No. 1952567267	Type of Business Construction		Approve Reject
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10 Sample UX Design – View All Pending Employers



LMS Labourer Management System			Q	Notification Reports	John Doe 🗡 🕞
Employers Pending Approva	al				<u>View All</u>
Output ID ∨	Output Name ∨	Date of Creation ∨	Version ∨	State ∨	Doc Type ∨
AK5292G-243	Dummy text	02/07/2015	V1.002	WI	Form
AK5292G-243	Dummy text	02/07/2015	V1.002	WI	Form
AK5292G-243	Dummy text	02/07/2015	V1.002	WI	Form
AK5292G-243	Dummy text	02/07/2015	V1.002	WI	Form
AK5292G-243	Dummy text	02/07/2015	V1.002	WI	Form
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