ONLINE BLOOD BANK SYSTEM USING CLOUD COMPUTING

Abstract:

Blood banks, which collect, process, and provide blood to hospitals and clinics in need, are crucial healthcare organizations. The manual techniques used in traditional blood bank management are prone to mistakes, inefficiency, and delayed operations. This study suggests using cloud computing to administer blood banks and raise their general effectiveness and efficiency. An internet connection is required for this project. Nearly every surgical procedure requires the use of blood. The number of people who require blood is rising daily because of advances in science and technology, yet there are still issues with blood scarcity and non-availability. Until a suitable blood management system is established, encouraging individuals to donate blood won't be of much use.

Introduction:

A blood bank is a financial institution or a place of storage where blood is gathered, conserved, and used as needed or requested. Everyone is aware that paperwork is a part of the conventional blood bank administration system. In times of crisis, its method of operation is insufficiently effective. The primary goal of developing a cloud-based blood bank system is to provide individuals with timely access to blood, even in dire circumstances. Known as a pilot project, the project blood bank management system was created to help the blood bank collect blood from a variety of sources and distribute it to those in need who have high blood-supply requirements. The software is made to manage the blood bank's everyday operations and conduct information searches as needed. Registering donor information, blood collection information, and blood issued reports is also helpful. The software application has been created in a way that it can accommodate all blood bank requirements in the future. The healthcare system is not complete without blood banks. By gathering, processing, and distributing blood and its constituent parts to hospitals and clinics, they play a vital part in saving lives. The conventional approaches of manage blood banks, however, are prone to mistakes and inefficiencies. The effectiveness of blood banks is hampered by the use of manual procedures, paper-based data, and delayed operations, which can cause serious issues with blood supply and distribution.

Technology:

Cloud Services Used for Hosting:

EC2:

Scalable computing power is offered by Amazon Elastic Compute Cloud (Amazon EC2) in the Amazon Web Services (AWS) Cloud. By using Amazon EC2, you can develop and deploy apps more quickly because you won't need to make an upfront hardware investment. Launch as many or as few virtual servers as you require, set up networking and security settings, and control storage using Amazon EC2. You can scale up or down with Amazon

EC2 to manage variations in demand or popularity spikes, which eliminates the need to predict traffic.

ELB:

Elastic Load Balancing (ELB) automatically distributes incoming application traffic across multiple targets and virtual appliances in one or more Availability Zones (AZs).

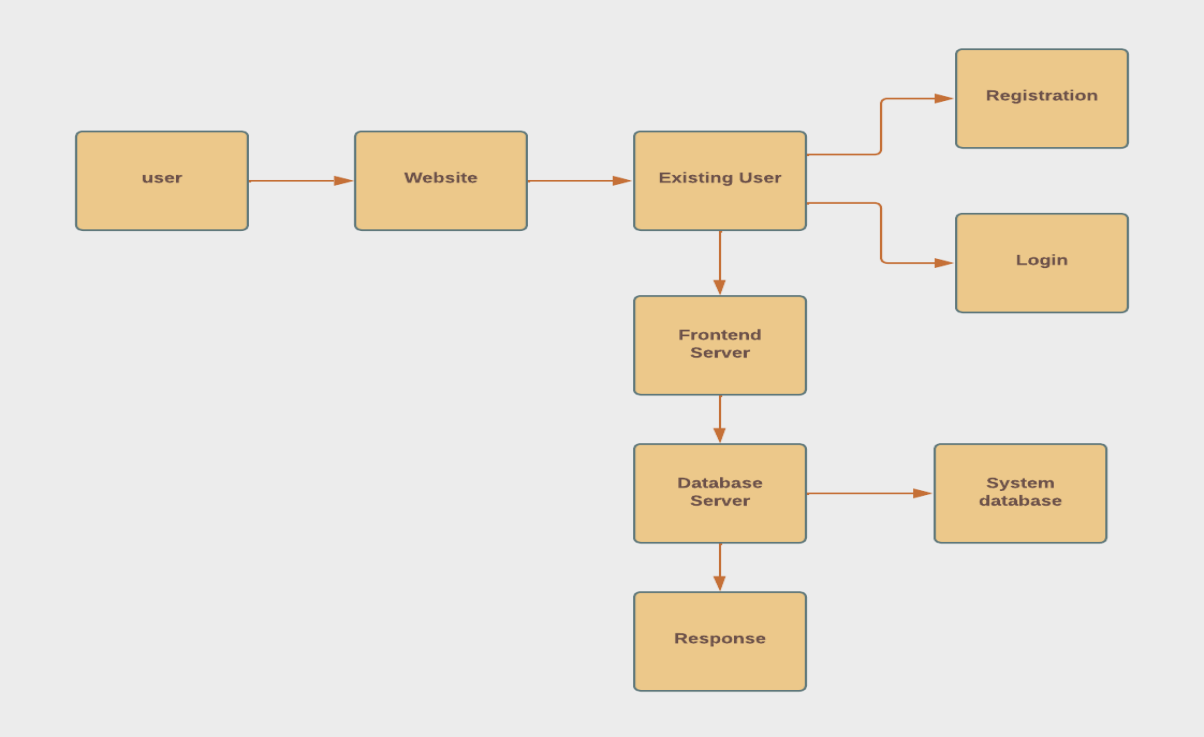
ROUTE53:

Amazon Route 53 is a highly available and scalable Domain Name System (DNS) web service. Route 53 connects user requests to internet applications running on AWS or on-premises.

RDS:

A group of managed services known as Amazon Relational Database Service (Amazon RDS) makes it simple to set up, run, and scale databases in the cloud. Choose one of seven well-liked engines — MySQL, MariaDB, PostgreSQL, Oracle, and SQL Server — and deploy it on- premises using Amazon RDS on AWS Outposts. Amazon Aurora also supports PostgreSQL and MySQL.

Architecture:



Components of AWS Architecture Diagram

1. ### Availability Zones

   The blood bank management system is deployed in two availability zones (AZs) to ensure highavailability and fault tolerance. Each AZ contains one public subnet and one private subnet.

2. ### Public Subnets

   The public subnets are in each AZ and contain an EC2 instance that hosts the web application and a NAT Gateway. The web application is accessible from the internet through Route 53 DNS service to the EC2 instance. The NAT Gateway allows the instance in private subnet to securely access external resources, such as databases and APIs, without exposing them to the public internet.

3. ### Private Subnets

   The private subnets are also located in each AZ and contain an EC2 instance that hosts the database server. The database server is accessible only from within the VPC and is not directlyaccessible from the internet. The security groups are configured in such a way that it will onlyaccept request from EC2 instance in public subnet.

4. ### EC2 Instances

   The blood bank management system on AWS includes two types of EC2 instances: web application and database servers. The web application servers are located in the public subnetsand host the web application, while the database servers are located in the private subnets andhost the database.

5. ### Application Load Balancer

   The application load balancer distributes incoming traffic across the EC2 instances hosting theweb application. It improves the availability and fault tolerance of the application by redirecting traffic to healthy instances in the event of a failure.

6. ### Route 53

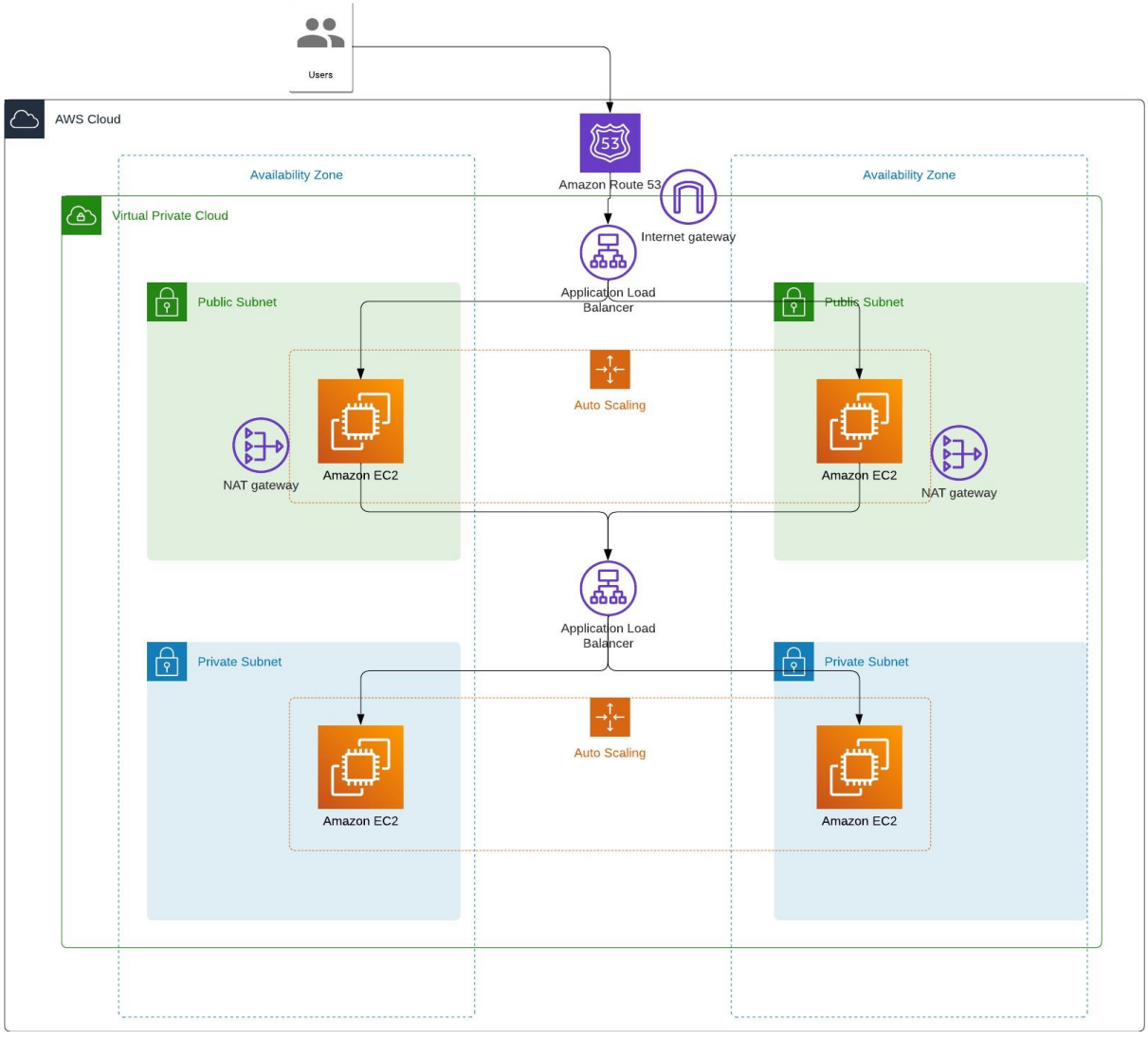
   Route 53 is a DNS service that enables users to route traffic to AWS resources. The blood bankmanagement system uses Route 53 to route incoming requests to the application load balancer.

7. NAT Gateway

The NAT Gateway is a service that allows the web application to securely access external resources, such as databases and APIs, without exposing them to the public internet.

8. Internet Gateway

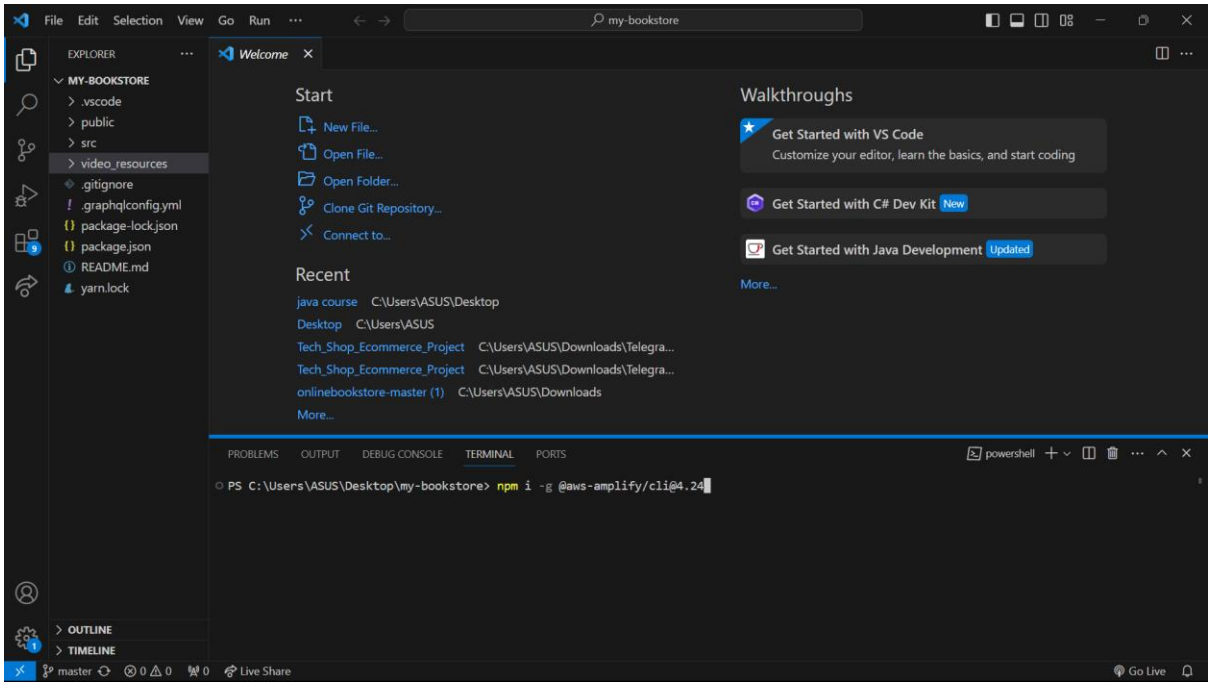
The internet gateway provides a path for incoming and outgoing traffic between the VPC and the internet. It enables the web application hosted in the public subnets to be accessible from the internet.

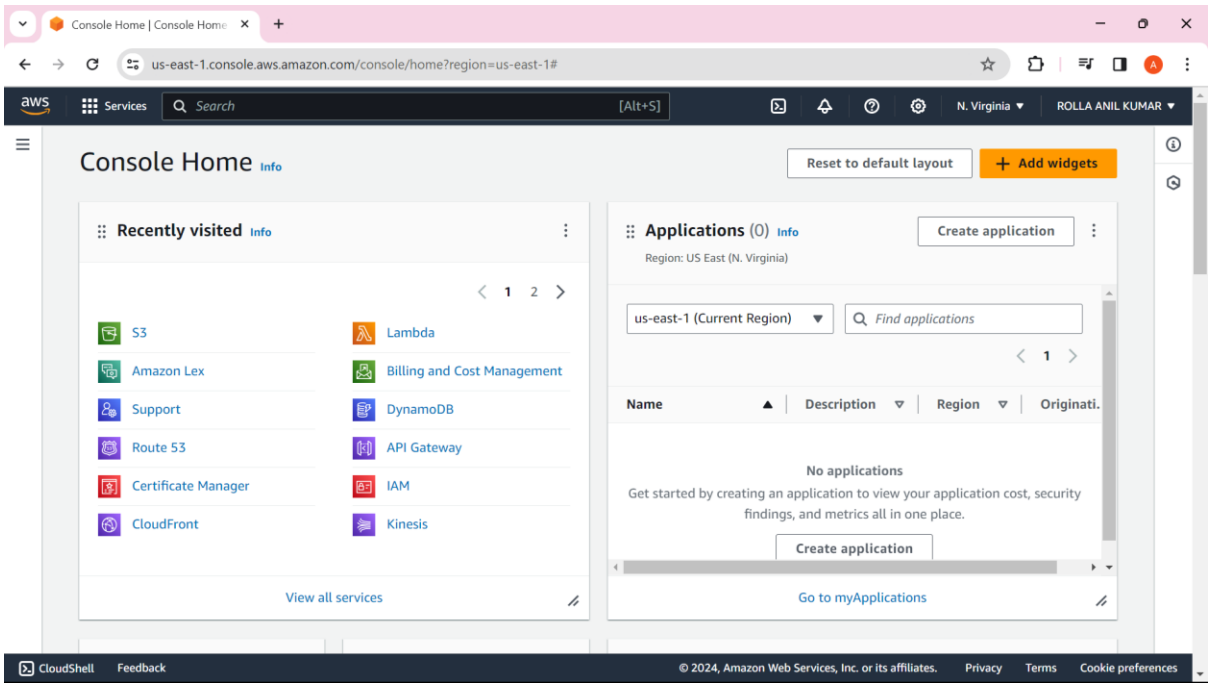


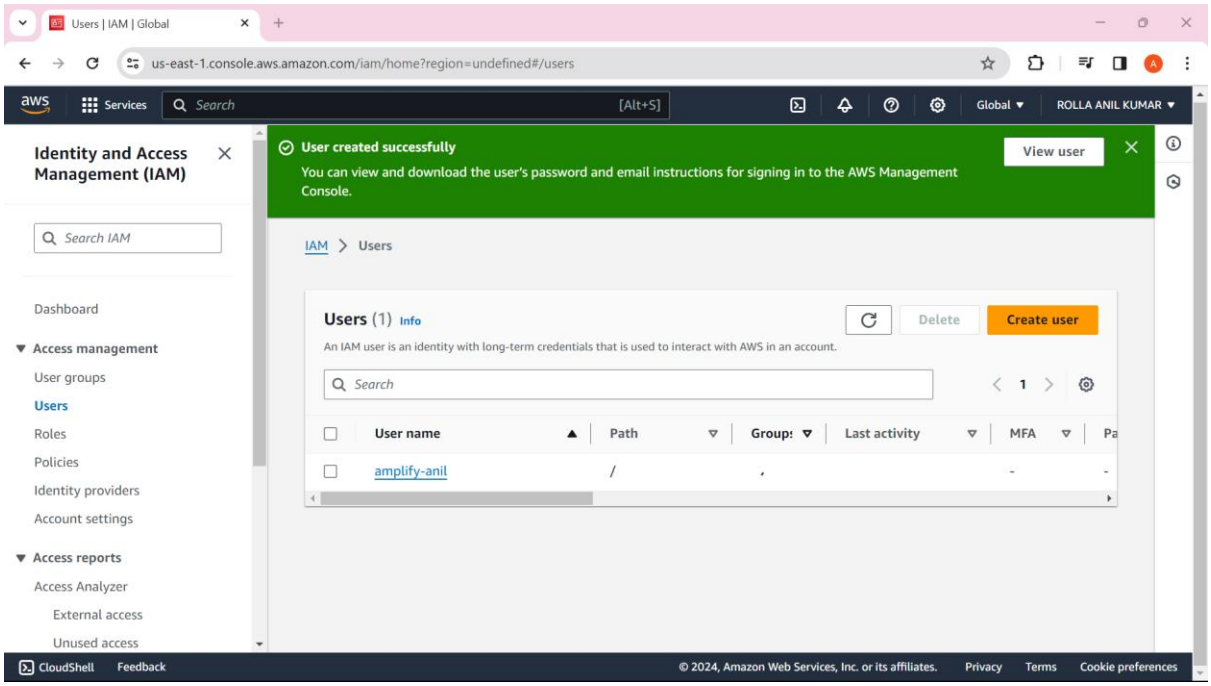
Results:

- Improved accuracy of data: The centralization of data and real-time access to information canreduce manual errors and improve the accuracy of data.

- Increased collaboration between stakeholders: Improved collaboration between differentstakeholders can help to speed up operations.
- Enhanced data security: The use of cloud computing technology can help to enhance thesecurity of sensitive information.



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Identity and Access Management (IAM)
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Dashboard
Access management
User groups
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Policies
Identity providers
Account settings
Access reports
Access Analyzer
External access
Unused access
User created successfully
You can view and download the user's password and email instructions for signing in to the AWS Management Console.
View user
IAM > Users
Users (1) Info
An IAM user is an identity with long-term credentials that is used to interact with AWS in an account.
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Create user
Search
User name
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Group:
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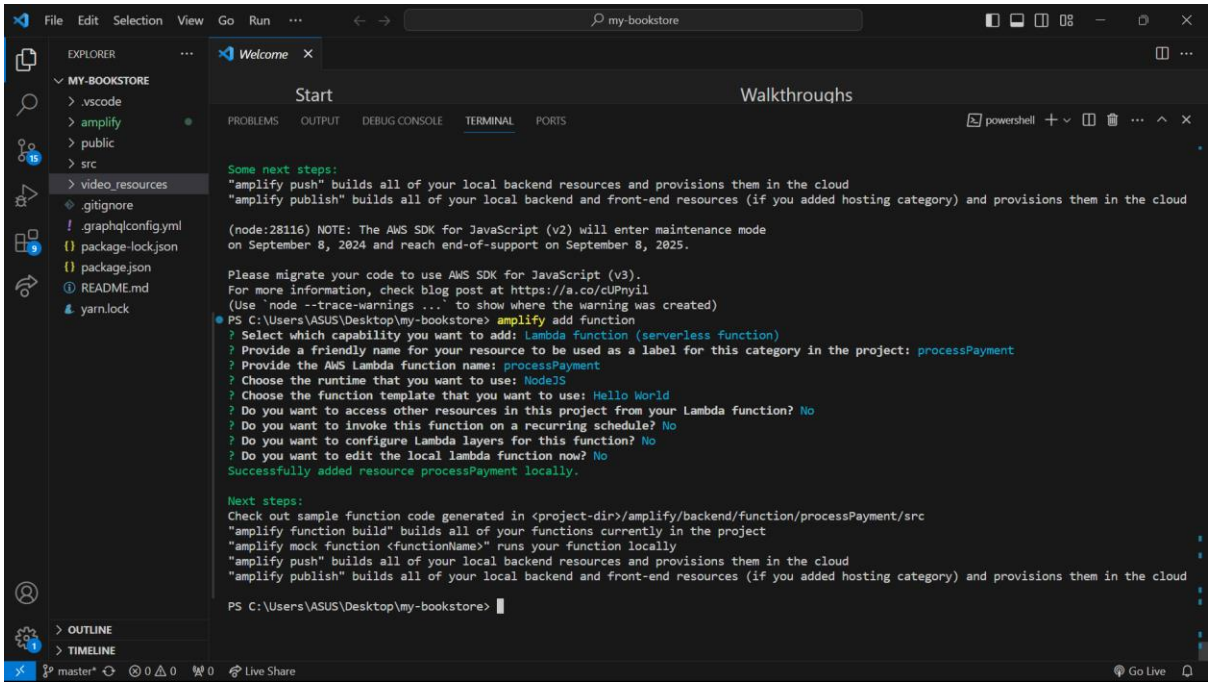
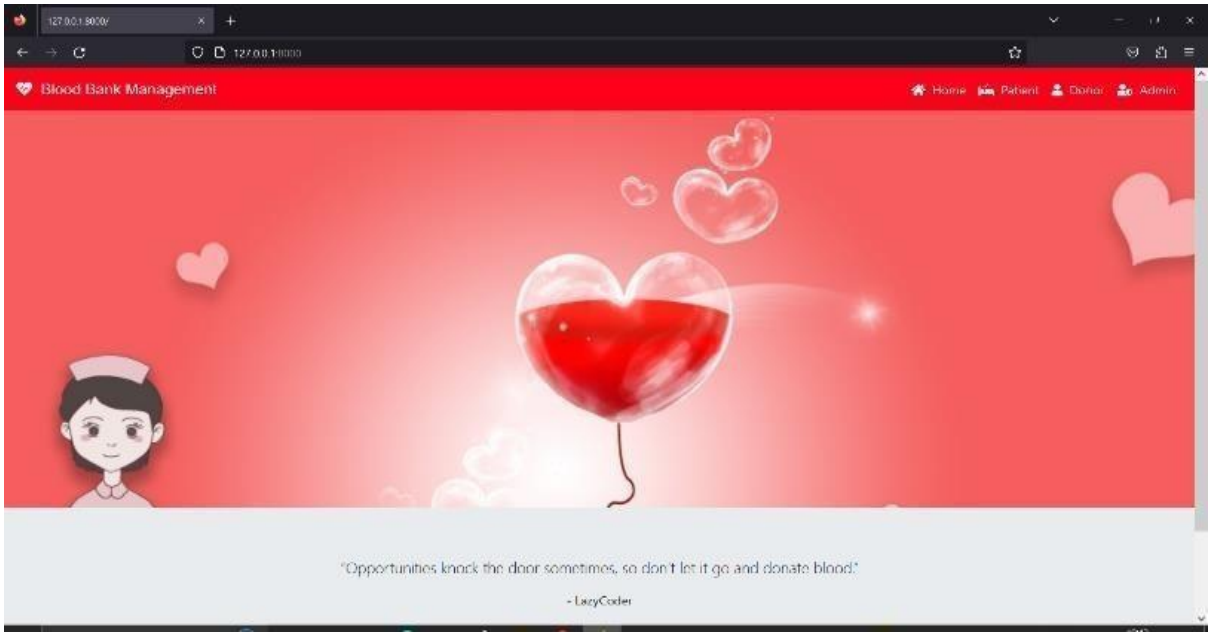
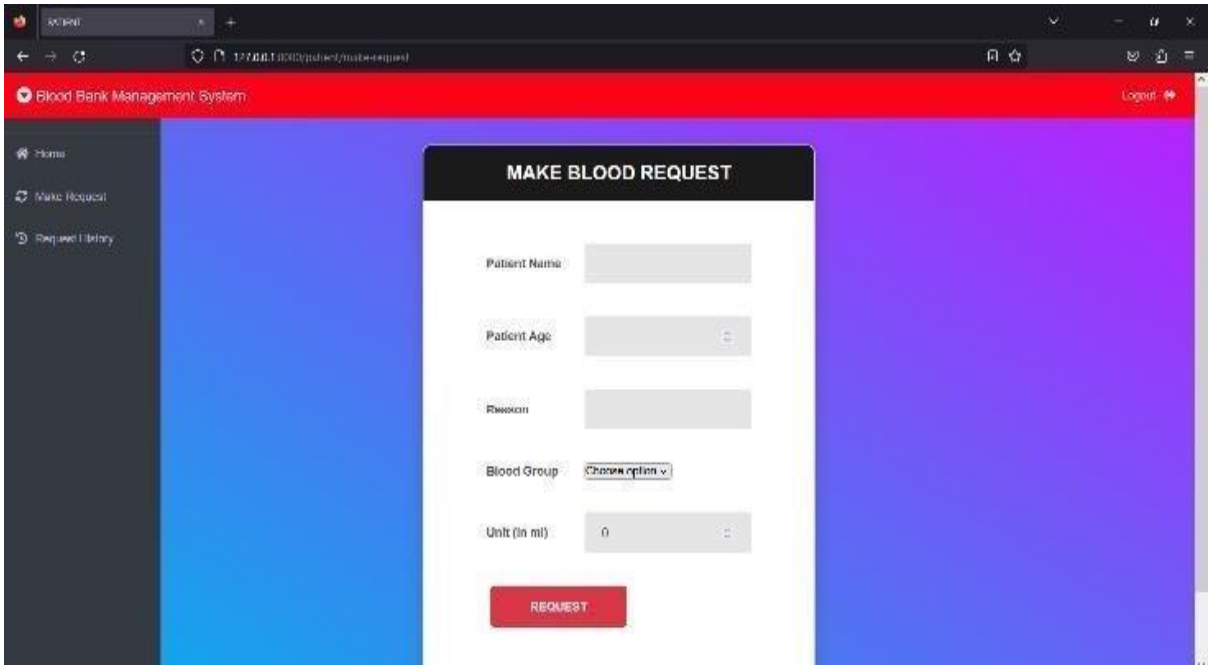

File Edit Selection View Go Run
my-bookstore
EXPLORER
MY-BOOKSTORE
.vscode
amplify
public
src
video_resources
.gitignore
.graphqlconfig.yml
package-lock.json
package.json
README.md
yarn.lock
Welcome
Start
Walkthroughs
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
powershell
Some next steps:
"amplify push" builds all of your local backend resources and provisions them in the cloud
"amplify publish" builds all of your local backend and front-end resources (if you added hosting category) and provisions them in the cloud
(node:28116) NOTE: The AWS SDK for JavaScript (v2) will enter maintenance mode
on September 8, 2024 and reach end-of-support on September 8, 2025.
Please migrate your code to use AWS SDK for JavaScript (v3).
For more information, check blog post at https://a.co/cUPnyil
(Use `node --trace-warnings ...` to show where the warning was created)
PS C:\Users\ASUS\Desktop\my-bookstore> amplify add function
? Select which capability you want to add: Lambda function (serverless function)
? Provide a friendly name for your resource to be used as a label for this category in the project: processPayment
? Provide the AWS Lambda function name: processPayment
? Choose the runtime that you want to use: NodeJS
? Choose the function template that you want to use: Hello World
? Do you want to access other resources in this project from your Lambda function? No
? Do you want to invoke this function on a recurring schedule? No
? Do you want to configure Lambda layers for this function? No
? Do you want to edit the local lambda function now? No
Successfully added resource processPayment locally.
Next steps:
Check out sample function code generated in <project-dir>/amplify/backend/function/processPayment/src
"amplify function build" builds all of your functions currently in the project
"amplify mock function <functionName>" runs your function locally
"amplify push" builds all of your local backend resources and provisions them in the cloud
"amplify publish" builds all of your local backend and front-end resources (if you added hosting category) and provisions them in the cloud
PS C:\Users\ASUS\Desktop\my-bookstore>
OUTLINE
TIMELINE
master*
Live Share
Go Live





Conclusion:

The administration of blood banks can gain a lot from using cloud computing, including betterdata accuracy, increased stakeholder engagement, and improved data security. To ensure the successful application of cloud computing in this industry, the drawbacks of cloud computingin blood bank management must be addressed and overcome. An online blood management system is a condensed solution to the issues with the current blood flow procedure that seeks to eliminate the barriers to having top-notch and hassle-free blood transfer.