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Developing A Serverless Stock Art Application - ArtBay Using Azure Platform

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ABSTRACT

In this ever-growing modern world, everything is developing at fast pace. Our world has now changed, and so are our methods and techniques. A major change has been bought in the technologies that we use with the help of applications. We have seen days when every operation used to be traditional to the days where the same operations are carried out digitally using much more advanced ways such as a simple web application. A web application is a website containing functionality and interactive elements. Many small business owners such as artists lack proper visibility to showcase their services to broader audience. Here comes the use of web applications or mobile websites. Mobile websites are such web apps that function on a smaller hand-held device like mobile phones. We often see an independent artist struggle for selling and displaying their services to a large audience manually as it is too time consuming and unmanageable for a single person. Having this in mind, I have developed an art stock application called ArtBay for the process of selling an artist's art works through web app managed on cloud with cloud services provided by Microsoft Azure.

Keywords— cloud computing, serverless computing, Azure, react, web application, mobile website

1. INTRODUCTION

Web Application- A web application is a website containing interactive elements which is accessible using any web browser. Its frontend is usually created using languages like HTML, CSS, JavaScript, which are supported by major browsers. Web applications can be used on any platform: Windows, Linux, Mac… as they all support modern browsers. In a web application, the user not only read the page content but also interact and manipulate the restricted data. An effective method to showcase your products and services.

Technology is progressing very fast. And today, most people prefer to get things done digitally rather than using the traditional way. To make business more convenient and effective, people are advancing their services by taking their operations on cloud and investing in cloud services. Keeping in mind the struggle faced by small business owners such as lack of audience, inability to showcase their products and services, and shortcoming in managing their sales procedure, I have developed an art stock web application that also works as a mobile website which helps artists to sell their artwork through the application and also helps users find artworks for their need all at one platform. It becomes easy to manage the application as it is deployed on cloud using Azure cloud platform. It not only saves artists their time but also saves money as they no longer need to buy separate servers or manpower to manage their data.

Stock Art Website Application- A Stock image/Art website contains an extensive library of high-quality images, graphics, Illustrations etc. which can be downloaded after the payment for that particular artwork is made. The artworks are digital files which can be downloaded upon payment. Using artworks and graphics as resources for commercial or personal use is great way to make a business or project stand out. Artists also earn on every purchase of their artwork and gets it in their bank which is linked to the application.

Azure-Microsoft Azure is Microsoft's public cloud computing platform. It provides a range of cloud services, including compute, analytics, storage and networking. One such service it provides is App service where I deployed my code and MySQL for importing my tables.

React-React is a frontend JavaScript library by Facebook which acts as a tool for building UI components. It is used for designing flexible and interactive user interface for web applications. Component based architecture: React is a component based language meaning it gives you a way to design complex applications and break them up into small little contained pieces and these little contained pieces are way easier to build, maintain, test and debug. Model of react component architecture is shown in figure 1.0 below.

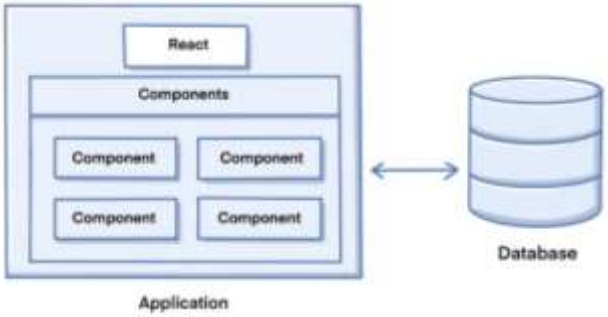

Figure 1.0 React component architecture

2. LITERATURE REVIEW

During the research, valuable information and insight were given by some authors regarding the subject of cloud computing, Azure platform, web application and its deployment in cloud platform.

[1] In a paper the author is speaks about the Azure platform. Azure provides different set of service platforms where every platform is responsible for providing a specific service to the application developers. The Azure Services Platform can be used by both the applications running on the cloud as well as the applications running or on in-house systems. Azure is a cloud platform that hosts the infrastructure of your current application and also, provides compute based services that are needed for your application development needs. Azure provides a combination of all the cloud services that you require to develop, test and deploy your application.

[2] Cloud Computing is discussed by authors as the storage of data and application on remote servers and accessing them via internet rather than installing and saving them on your personal computers. The aim of Microsoft Azure is to build a web application that runs and stores its data in Microsoft datacentres. It stores data while the applications that consume this data run on premise (outside the public cloud). This advantage has been put to use for storing the data of ArtBay on Azure SQL server. SQL Azure is built on Microsoft SQL server. As with other cloud technologies, an organization pays only for what it uses. Using a cloud database also allows converting what would be capital expenses, such as investments in disks and DBMS software, into operating expenses.

[3] The reason for selecting Microsoft Azure over other cloud service provider has been explained by an author of this paper where it has been stated that Microsoft Azure is a flexible cloud platform that allows fast development, debugging and iteration of the applications. Extra Large (A4) Azure instance has 8 virtual CPU cores and 14GB for 0.72 dollars/hour, whereas some of the Microsoft Azure competitors offer the same services at higher costs. Not only Azure has an easy and intuitive user interface for managing virtual resources, but it offers comparatively stronger virtual machines that are sufficient to host websites for any organization demanding low to heavy traffic.

3. SOFTWARE AND HARDWARE REQUIREMENS

Hardware requirement

- RAM: Minimum of 2GB
- Hard Disk: Minimum of 8GB
- Input Device: Keyboard, Mouse
- Output Device: High-Resolution Monitor

Software Requirement

- Operating System: Windows 7 or above
- Browser: any (preferred Google Chrome)
- Cloud Platform: Microsoft Azure
- Cloud Subscription: Azure Subscription

4. ARCHITECTURE

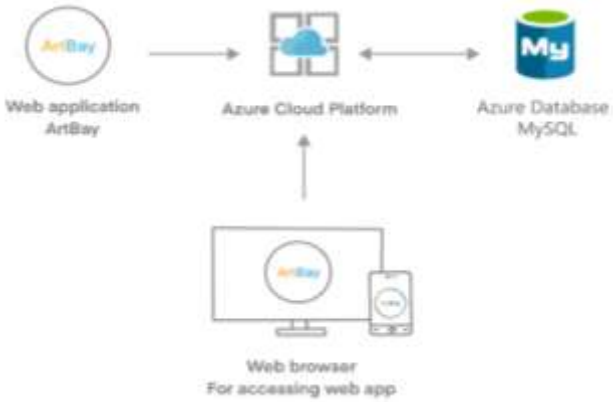

Figure 2.0 Workflow of ArtBay

A web App works on the basic workflow of buying and selling of digital artwork through app hosted on cloud platform. Workflow in an app is a sequence of actions or processes defined in steps. The actions will perform the operations when input is provided through the managed entry points. Figure 2.0 shows the workflow used for the process of workflow of ArtBay.

5. PROBLEM STATEMENT

Traditional way of showcasing and selling products and services for business owners has many downsides to it. The process is manual hence it is time-consuming and error prone. The selling process when carried manually needs the buyer to visit the business owner, in our case the artist, for each purchase which is not only time taking, but it also not feasible in some situations like Covid-19 where people avoid transportation and gathering. The problem with traditional approach is not only limited to that, but also the additional cost for the artists on staff members who manages their sales, accounts, databases etc. It not only needs a physical space for storage but also it is still prone to human mistakes and errors. Backup of physical data is one more issue to look at. The traditional method of selling and buying artworks are carried out manually using paper-pen method rather than digital method which is against Green India and Digital India campaigns. India still lacks applications like stock image websites which are at the moment very popular in western countries.

6. PROPOSED SOLUTION

The Proposed Method overcomes the drawbacks that exits in the present traditional art selling and buying procedure process by using Azure platform for integration of stock art website application. Using Azure services, integration of the art stock web app is carried out which is also attached to the Sql database for the storage of sales data. Implementing it using serverless cloud service makes the whole process cost-effective and time-efficient. No additional staff is needed for carrying out the process of maintaining database records or performing backups. These operations are taken care by the Azure making the process faster, cost-effective and efficient. By hosting the art stock app on Azure, buyers no longer need to travel to artists for buying te artworks rather they just need to login to the website app with their google account and buy artwork which makes the whole process a lot more convenient and easy.

7. PROPOSED MODEL ARCHITECTURE

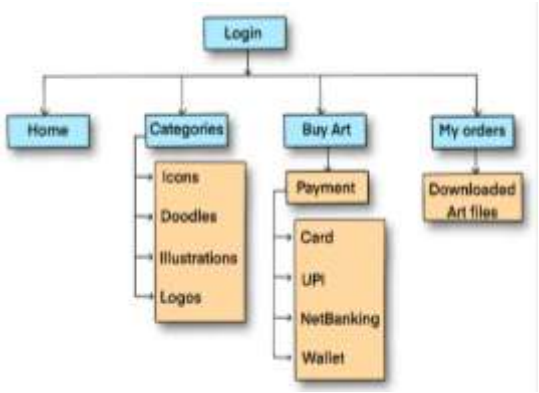

Fig 3.0 Proposed Model Architecture

Fig 3.0 shows the working of the proposed model. The stock art web app comprises of 5 main elements:

- Login – Login page comes when a user wants to buy any artwork from the application. The user needs to log themselves in with the help of their google accounts. This provides a sense of security that the use is genuine and once they are logged in is only when they can shop for artworks present on ArtBay.
- Home - This is the main landing page of the art stock application – ArtBay. It consists of a main menu toggle drop down button containing shortcut options to navigate the application.
- Categories – This section of our application contains everything that the app has to offer to its users. It displays different categories of artwork that the user can buy (download). This section is further divided into 4 different categories which are:
  - Icons
  - Doodles
  - Illustrations
  - Logos
- Buying - Buying section of the app comes into play once the user needs to download any artwork from the app. As soon as they click on 'Buy Now' button, they are directed to the payment page. Here they get several options for making their payment such as:
  - Card
  - UPI/QR
  - Net Banking
  - Wallet
- Orders – In the order section of the application, the user can find all of their purchased artworks that they bought on the app. From here they can keep a record of their digital art files.

8. FLOW CHART

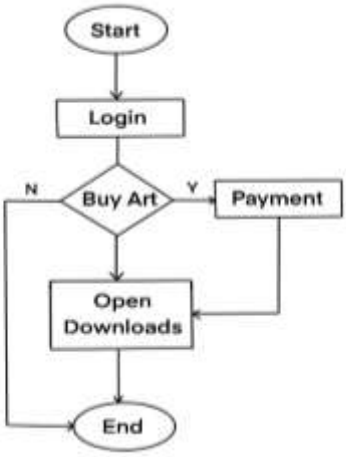

Fig 4.0 Application Flow Chart

9. IMPLEMENTATION

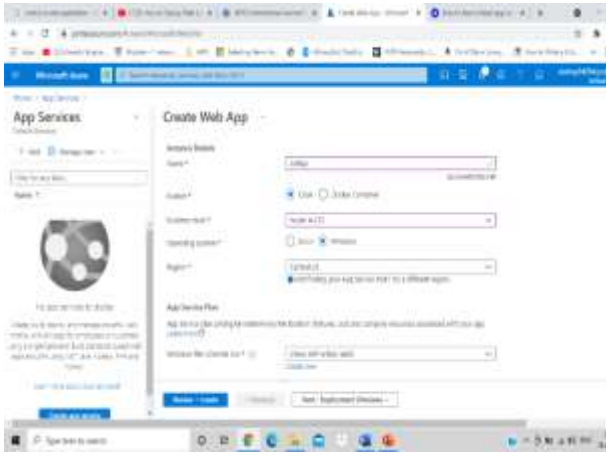

Fig 5.0 Creating Web App (ArtBay)

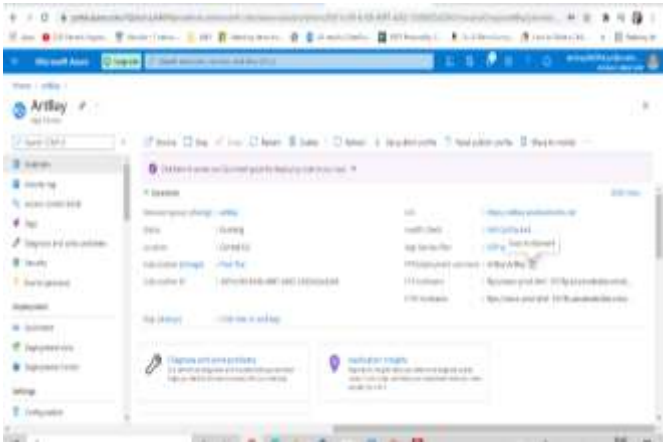

Fig 5.1 Web App overview

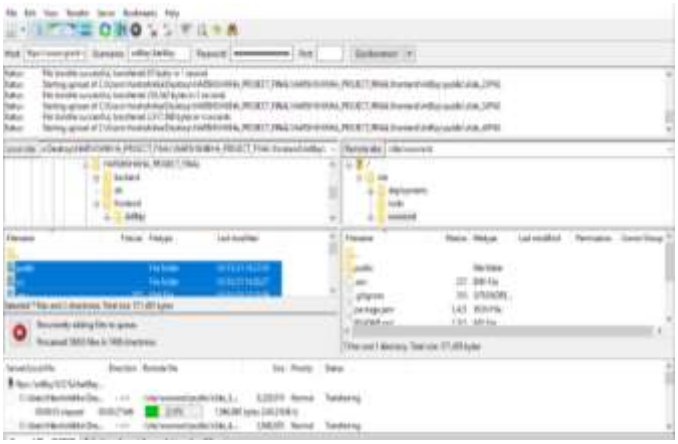

Fig 5.2 Uploading Web app code through FileZilla

10. OUTPUT

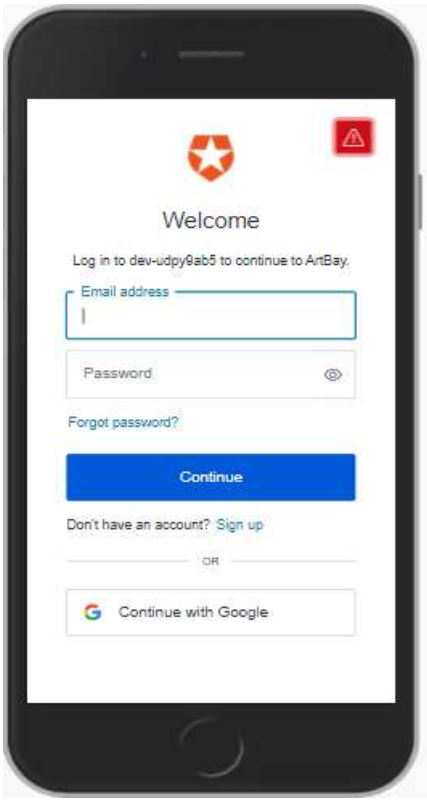

Fig 6.0 Login Page

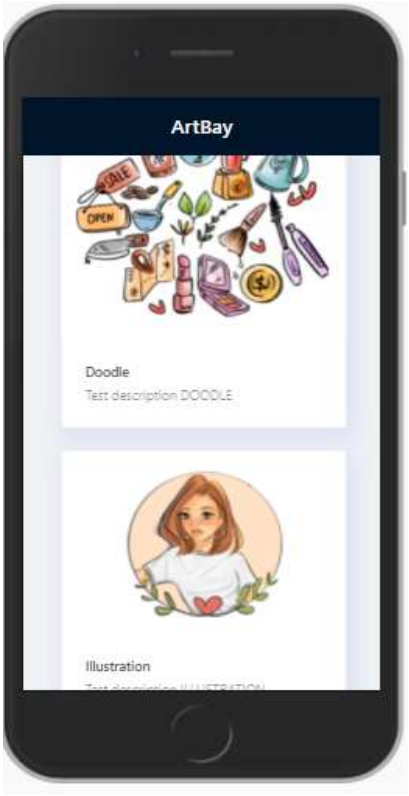

Fig. 6.4 Category Page

Fig 6.2 Home Page

Fig. 6.5 Products Page

Fig. 6.6 Payment Page

Fig. 6.7 My Orders Page

11. CONCLUSION AND FUTURE DEVELOPMENT

11.1 Conclusion

The main objectives of the project were to design an easy and time saving method for users looking for digital artworks on a frequent basis for commercial use or personal use projects. The aim was to develop a hassle-free buy and sell process by artist's perspective as well as for buyer's perspective. The proposed project makes the whole process digital and automated thereby becoming a paper-less, contact-less, and most convenient method for buying art.

11. 2 Future Development

The proposed model is developed eliminating the drawbacks of traditional approach but it still has some room for extensions and enhancements that can be made in future such as making a mobile application for the same website. Watermark can be added to the artworks for further security. As this app is now for only one artist selling his/her art, it can be made available to n number of artists by adding an artist's portal.

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