

DESIGN AND DEVELOPMENT OF A SAAS-BASED DIGITAL BUSINESS CARD PLATFORM USING MERN STACK

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Abstract: Traditional paper business cards are not very good because the information on them does not change and you have to pay to print them again and again. Also, it is not easy for people to get the information from them. This research paper is about a digital business card platform called Phygital. We made Phygital using the MERN stack. This platform lets users make their digital business cards and share them with others using QR codes and public profile links. We used React to make the frontend of the platform, Node.js and Express for the backend and MongoDB to manage the database. We also used Cloudinary to store media and Render to deploy the platform. The Phygital platform is very secure. It is easy to use on different devices. It also tracks how people use it. Helps people network with each other in a better way. The results show that Phygital makes it easier for people to get the information they need reduces the need for paper and helps people connect with each other efficiently. The Phygital digital business card platform is a solution, for people who want to network with others.

Keywords: SaaS, MERN Stack, Digital Business Card, Web Development, QR Code, Cloud Deployment

I. INTRODUCTION

The way people and companies share information has changed a lot because of transformation. For a time people have been using paper business cards to connect with others in their field. But these cards have some problems. The information on them does not change it costs money to print them again they take up a lot of space and they are bad for the environment because they waste paper. In today's digital environment, professionals require efficient methods for managing and sharing their identities online [2]. Digital business cards are a way to share contact information, professional details, social media links and business information using digital platforms [1]. These digital cards are better than cards because they can be updated at any time are easy to get to and can be personalized. Some platforms that already exist can do some things but they do not let people personalize much they cost money to use and they do not have advanced features like tracking and easy access to the cloud. To fix these problems this project is making a digital business card platform called Phygital. Phygital is a Software-as-a-Service platform designed for scalable digital networking [3]. This platform lets people make their digital business cards manage their professional information make QR codes share links to their public profiles and see how people are interacting with them.

The system is made to be easy to use, safe and able to handle a lot of users. The platform uses React to build the user interface, Node.js and Express to handle the backend and MongoDB to manage the database.

- Other technologies like Cloudinary are used to store

media. Render is used to put the platform online.

- The goal of this project is to make a networking platform that is efficient reduces the need for traditional business cards and helps people brand themselves professionally.

The digital business card platform is a solution, for professional identity sharing and it is an important part of digital transformation. Digital business cards are the future of networking and they will continue to grow in popularity as more people realize their benefits.

II.LITERATURE REVIEW

The way we use the internet has changed a lot. Now we have many digital tools for networking and managing our identities. People do not use business cards as much as they used to. Instead they use business cards that are easier to access and more flexible. Some studies have shown that digital platforms are really important for improving the way we communicate and reducing our need for things.

There are already some business card platforms[1] like HiHello, Blinq and Popl that let users share their contact information using QR codes customize their profiles and manage their contacts. These platforms show that people really want networking solutions. However many of these platforms do not let users customize their cards much and they charge money for extra features and analytics.

Some researchers have stated that SaaS platforms improve scalability and reduce infrastructure costs [3]. SaaS applications can be accessed from anywhere are easy to manage and can be

set up in ways. Most SaaS platforms are now connected to cloud platforms to make sure they are reliable and work well. Recently full-stack development has improved significantly with frameworks such as MERN stack [5]. Now developers can build big applications using tools like React, Node.js, Express and MongoDB. The MERN stack is popular because it is flexible makes it easy to develop the frontend handles APIs and works seamlessly with NoSQL databases. After looking at the existing business card systems and technologies it is clear that we need a platform that combines customization, scalability, analytics tracking and cloud deployment. The proposed Phygital platform addresses these issues, by providing a SaaS-based digital business card system. The Phygital platform is a business card system that uses SaaS and cloud deployment to make it scalable and easy to access. The Phygital platform provides customization options, analytics tracking and cloud deployment making it a complete digital business card solution.

Table 1: Comparison of Existing Digital Business Card Platforms

Platform	QR Sharing	Customization	Analytics	Pricing Model
HiHello	Yes	Medium	Limited	Subscription
Blinq	Yes	Medium	Limited	Freemium
Popl	Yes	High	Medium	Subscription
Phygital	Yes	High	Advanced	SaaS

III. PROPOSED SYSTEM

The Phygital system is a business card platform that people can use on the internet. It helps solve the problems that traditional paper business cards and other digital networking platforms have. The Phygital system gives users a place to create, customize, manage and share their digital business cards using the cloud. Users can sign up for the system and log in safely using special codes. After they log in they can make their digital business cards by filling in their name, job title, company information, contact details, social media links and profile pictures. They can also pick from templates and change how their cards look to fit their personal brand.

One of the major features of the system is QR code generation for quick information sharing [1]. The system automatically makes a QR code for each digital business card so users can quickly share their professional information with others by scanning the code with their smartphone. The platform also makes public profile links that users can share through messaging apps, email and social media.

The Phygital system also helps users see how many people visit their profile scan their QR code and how much they engage with others. This helps users understand how well they are networking and if their digital interactions are working.

The Phygital system was built using the technology, including React for the frontend, Node.js and Express for the backend and MongoDB for storing data. Cloudinary was used to store images. Render was used to deploy the application using cloud infrastructure principles [3].

The Phygital system wants to make networking better by giving people a digital solution that is easy to use, safe good, for the environment and can be used by many people. The Phygital system is a way for people to network and share their professional information with others. The Phygital system is a business card platform that makes it easy for people to connect with each other.

3.1. SYSTEM ARCHITECTURE

The Phygital platform is being built using a full-stack architecture. This means the client-side, server-side, database and cloud services all work together to deliver a digital business card solution that can handle a lot of users. The system uses MERN stack architecture because of its flexibility and scalability [5].

The frontend layer is developed using React [6], and Tailwind CSS. This layer handles what the user sees and interacts with. It creates the user interface manages how digital cards are made and shows analytics dashboards. The frontend talks to the backend using REST APIs.

The backend layer uses Node.js and Express [7][8]. It takes care of user authentication figures out business logic generates QR codes, tracks analytics and manages API requests.

The database layer uses MongoDB for flexible NoSQL data storage [9].to store information, about users, digital cards, analytics and application data. MongoDB was chosen because it is flexible and works with JavaScript-based technologies.

Cloudinary is used for media storage and optimization [10]. and branding assets for media management. The whole application is deployed on Render so it can be accessed from the cloud and handle a lot of users.

The project is being developed using a methodology. This means the team goes through phases like analyzing requirements designing the user interface developing the frontend and backend, testing and deploying. This approach allows for improvements as the project is being built. The Phygital platform development team follows this iterative approach to make sure the platform is the best it can be.

IV.IMPLEMENTATION AND RESULT

The Phygital platform was built during this phase. We made all the main parts of the platform work together. The part that users see was made with React.js and Tailwind CSS. This makes the Phygital platform work well on devices. We used Node.js and Express.js for the backend. This helps with security. Talking to the database. We made a way for users to register and log in securely. We used something called JWT to keep user sessions safe. This also helps keep the dashboard safe. Secure authentication implementation follows standard software engineering principles [4].

The Phygital platform has a part where users can make their digital business cards. Users can add their work information. They can also add a picture. Pick a template. Then they can share their business cards with a link or a QR code. We used Cloudinary to store and make images work better. The platform was deployed using cloud deployment technologies [3]. This means people can use it from anywhere at any time. The Phygital platform can track how users interact with it. It looks at things, like how times a users profile is viewed. It also looks at how times a QR code is scanned. This helps users see how well they are doing with their networking. We tested the platform to make sure it works well. It is responsive. Works fast. The results show that the Phygital platform does what it is supposed to do. It is a way for people to network digitally.

Table 2: Implementation Results

Module	Status
User Registration/Login	Successfully Implemented
Card Creation	Successfully Implemented
QR Code Generation	Successfully Implemented
Public Profile Sharing	Successfully Implemented
Analytics Dashboard	Successfully Implemented
Cloud Deployment	Successfully Implemented

V.CONCLUSION

This research paper is about a business card platform that is based on the internet. It was made using the stack. The system was made to fix the problems with paper business cards. It provides a way for people to connect with each other digitally that's fast, safe and works well. The platform lets users make their digital business cards. They can also make codes that people can use to get to their profiles. Users can share their profiles. See how people are using them. This is done with the help of tools that track how people are using the platform. The people who made the platform used technologies like React, Node.js, Express, MongoDB, Cloudinary and Render. These tools helped them make a digital business card platform that is based on the internet. The results show that the platform makes it easier for people to get to business cards. It also reduces the need for paper business cards. This is good, for the environment. The platform also makes it easier for people to connect with each other in a way.

The project shows how new technologies can be used to solve

problems. It shows how cloud-based applications can be used to make peoples lives easier. The digital business card platform is an example of this. It uses the stack and other new technologies to provide a useful service. The digital business card platform is a way for people to connect with each other digitally. It is a business card platform that is based on the internet and uses the MERN stack. The platform is working fine but there are some things that can be added to it later on. These include things like making apps for Android and iOS mobile phones.

- Future enhancements may include NFC-enabled business cards [1].
- It can include AI-Based templates recommendations for users.
- The Future Scope of the platform also includes supporting languages.
- It can be connected to something called CRM, which businesses use.
- The platform can also have plans for people who want to pay for extra services, which is the same thing as Premium SaaS subscription plans.

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VI.REFERENCES

- [1]. A. S. Doiphode, J. Musale, R. T. Trivedi, K. Dhumal, and A. M. Chaphe, "Digital Business Card Using NFC-Enabled Card," in Recent Advances in Sciences,
- [2]. Engineering, Information Technology & Management, 1st ed., CRC Press, 2025.
- [3]. D. Birch, Ed., Digital Identity Management: Technological, Business and Social Implications, 1st ed. London: Routledge, 2007. doi:10.4324/9781315257792.
- [4]. D. Comer, The Cloud Computing Book: The Future of Computing Explained, 1st ed. Boca Raton: Chapman and Hall/CRC, 2021. doi:10.1201/9781003147503.
- [5]. Review on Study and Usage of MERN Stack for Web Development, International Journal for Research in Applied Science and Engineering Technology (IJRASET), 2022.

- [6]. Y. Wang, Software Engineering Foundations: A Software Science Perspective, 1st ed. New York: Auerbach Publications, 2007. doi:10.1201/9780203496091.
- [7]. React Documentation, React Official Website. Available: <https://react.dev>
- [8]. Node.js Documentation, Node.js Official Website. Available: <https://nodejs.org>
- [9]. Express.js Documentation, Express Official Website. Available: <https://expressjs.com>
- [10]. MongoDB Documentation, MongoDB Official Website. Available: <https://www.mongodb.com>
- [11]. Cloudinary Documentation, Cloudinary Official Website. Available: <https://cloudinary.com/documentation>
- [12]. Render Documentation, Render Official Website. Available: <https://render.com/doc>

