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ID Card Generator

Kalyani Ghugal

PG Student, Department of Computer Application, G. H. Raisoni University, Amravati, Maharashtra, India

ABSTRACT

Identity verification is a crucial process for schools, businesses, and institutions where secure and standardized identification is required. Traditionally, creating ID cards has involved manual tools or basic design software, leading to inefficiencies and inconsistent results. This research introduces a web-based ID Card Generator system designed to simplify and automate the process of ID card creation.

Built using full-stack web technologies like React.js, Node.js, and MongoDB, the system allows users to design ID cards with live preview, automatically generate unique ID numbers and QR codes, and export print-ready PDF versions. The platform also includes user authentication, role-based access control, and database storage of issued cards. By automating repetitive tasks and providing a modern interface, the system minimizes human error and enhances operational security.

KEYWORDS: *ID Card, Web Application, QR Code, PDF Export, Digital Identity, Full Stack Development, Authentication.*

I. INTRODUCTION

In many organizations, identity cards are more than just a formality—they represent a secure access tool and a part of daily operations. However, most ID card generation processes remain inefficient, relying on manual design and data entry, which not only slows down productivity but also increases the risk of errors and inconsistencies.

To address these issues, the ID Card Generator project presents an end-to-end digital solution that allows organizations to create, preview, and issue identity cards with ease. The platform supports the customization of card layouts, embeds QR codes for verification, and enables PDF download for printing. Using a web interface accessible from any device, it allows both administrators and authorized personnel to manage identity records securely and efficiently.

The project also tackles challenges like secure data handling, user role management, and quick updates to existing designs, ensuring the system is both scalable and flexible for future use.

II. RELATED WORK

Several applications and systems have emerged over the years for ID card generation, but many are desktop-based or limited to template-driven platforms that don't allow real-time customization or multi-user access. Moreover, most of these systems do not integrate security features such as role-based authentication or data encryption.

Research in identity management has shown a growing need for web-based solutions that not only automate card creation but also store and manage issued cards centrally. Some modern tools have introduced QR code integration and PDF generation, yet few offer a full combination of customization, live preview, secure login, and easy deployment.

The proposed ID Card Generator stands apart by merging all these requirements into a single platform that is easy to use, cost-effective, and capable of meeting institutional needs.

Data and Sources of Data

The system uses a variety of data inputs to generate and manage ID cards:

- **User Inputs** – Data provided by the user such as name, designation, department, and uploaded photograph.
- **System-Generated Data** – Auto-created fields such as ID numbers, timestamps, and QR codes.
- **Image Files** – Profile photos and institution logos uploaded during customization.
- **Database Records** – All entered and generated data are stored in a secure database for tracking, retrieval, and editing.

All sensitive data is encrypted and access is restricted based on user roles. QR codes contain encoded identifiers that can be scanned for quick verification.

III. RESEARCH METHODOLOGY

The development of the ID Card Generator followed a structured methodology to ensure both technical robustness and user-friendliness:

1. **Requirement Analysis** – Identified organizational needs through user interviews and industry research.
2. **Design** – Created low- and high-fidelity wireframes for a smooth UI/UX experience, and designed the database schema.
3. **Development** – Used React.js for the frontend, Node.js and Express.js for the backend, and MongoDB/MySQL for the database.
4. **QR Code & ID Generation** – Integrated libraries for generating unique IDs and QR codes dynamically.
5. **PDF Export Module** – Implemented PDF generation for finalized cards using tools like PDFKit.
6. **Testing** – Conducted detailed functional, security, and usability testing.
7. **Deployment** – Hosted the system on Vercel and Firebase with SSL and security protocols.

The methodology ensured that the system met real-world performance expectations and could adapt to future requirements.

Implementation Plan with Modules The system was developed in phases, with each phase addressing specific functionality. The major modules include:

- **User Authentication & Role Management** – Ensures only authorized users (Admin, HR, Staff) can access certain features.

- **ID Card Designer Module** – Allows users to design personalized cards by uploading images, adding names, departments, and other dynamic fields.
- **Real-Time Preview** – Reflects design changes instantly so users can make edits before final generation.
- **QR Code & ID Generation** – Generates a unique ID and corresponding QR code for each card, linking to stored user data.
- **PDF Export** – Enables printing of high-quality, downloadable ID cards.
- **Database Integration** – Stores all user and card data securely, allowing administrators to retrieve, update, or archive records.
- **Admin Dashboard** – Centralized space to manage users, view history, and perform administrative actions.

These modules work together to deliver a seamless experience from input to output.

F1-score on a separate validation and test set, ensuring its generalizability and effectiveness in real-world applications.

Figures and Tables

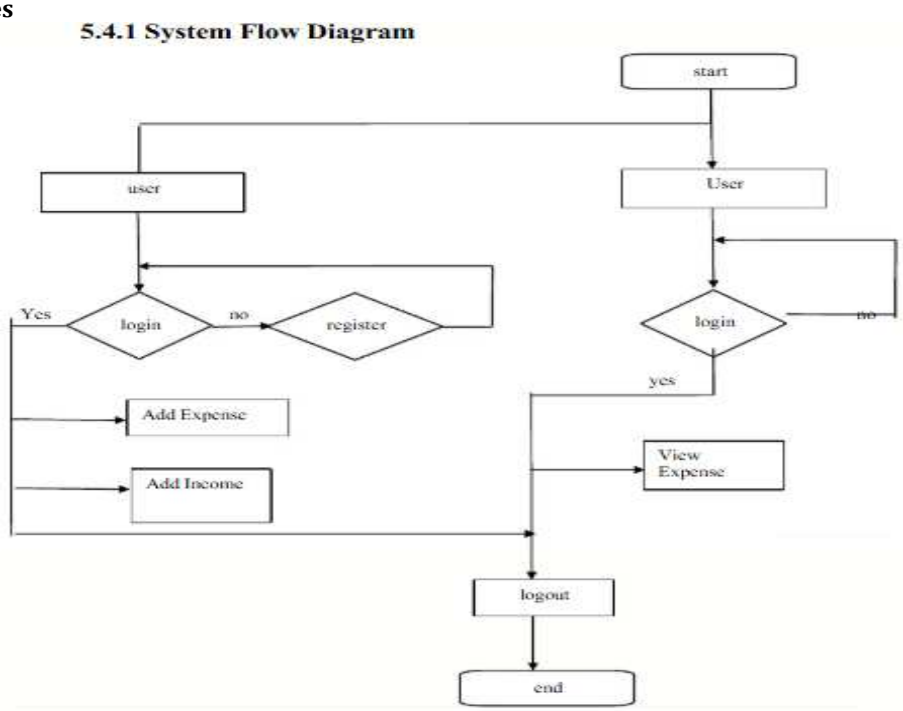

Fig.1 System Architecture of Id Card Generator

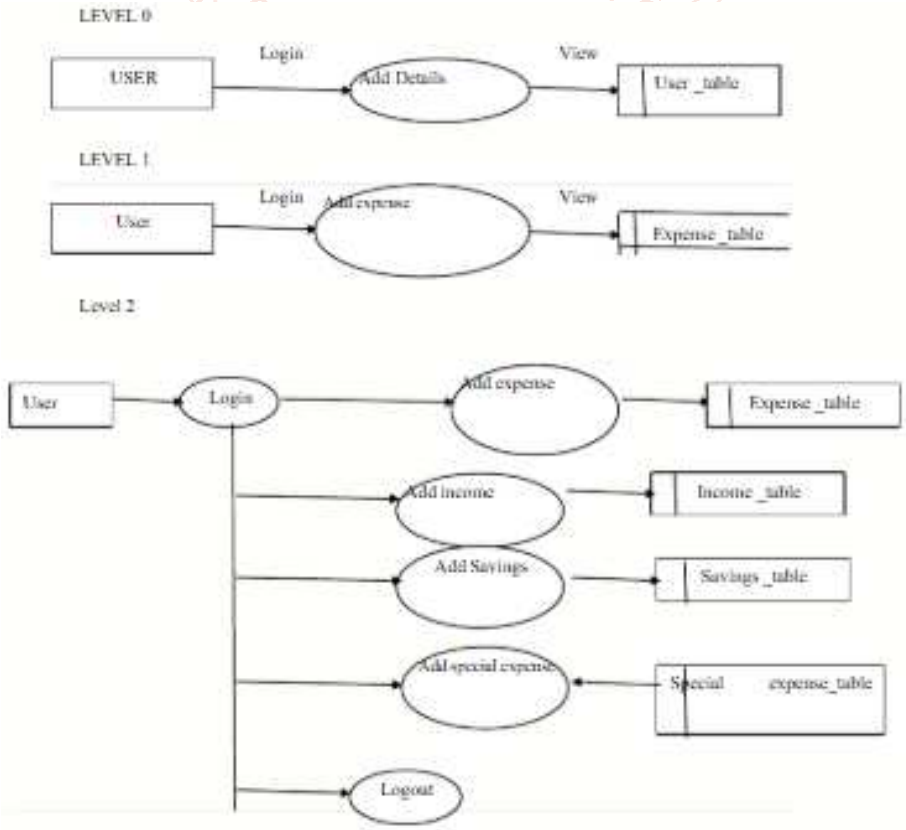

Fig.2 Data Flow diagram for Id Card Generator

Figure 1: This flowchart provides a high-level overview of how users interact with the system. The diagram begins with a **start** node and flows through the main processes of login, registration, and key functionalities such as adding expenses and income or viewing existing records. Here's a breakdown:

- **Start**: The process begins when a user initiates the application.
- **User Decision**: The system checks if the user is already registered.
  - If **not**, the user proceeds to the **register** stage.
  - If **yes**, the user attempts to **login**.
- **Login Process**:
  - On successful login, the user is given access to features based on their role.
  - They can either **add expense**, **add income**, or **view expense**, depending on their access and needs.
- **Logout**: Once tasks are completed, the user can **logout**, and the session ends.

This diagram ensures a simple yet clear visual for system navigation and user decision-making paths.

Figure 2: **Explanation:**

These three data flow diagrams show progressively detailed levels of the system's data interactions.

Level 0 (Context Level):
- Describes the overall interaction between the **user** and the system.
- The user logs in, adds their details, and views stored data in the **User_table**.
- This level abstracts internal processing and focuses on inputs/outputs.

Level 1:
- Introduces a more specific interaction: users can **add expense** data and view it from the **Expense_table**.
- This shows how financial data (specifically expenses) is collected and stored.

Level 2:
- Offers the most detailed breakdown:
  - The user logs in and accesses four main operations:
    - **Add Expense** → saved to **Expense_table**
    - **Add Income** → saved to **Income_table**
    - **Add Savings** → saved to **Savings_table**
    - **Add Special Expense** → saved to **Special_expense_table**
- This level maps real functions to backend data storage, giving developers a clear path for database structure and interaction logic.
- Finally, the **Logout** action safely ends the session.

IV. RESULTS AND DISCUSSION

- **Results** Testing the system under various scenarios yielded the following results:
- The platform handled real-time editing and previewing smoothly without noticeable lag.
- Unique ID numbers and QR codes were consistently generated without duplication.
- PDF files produced were of high resolution, suitable for direct printing.
- Role-based access successfully restricted data visibility to authorized users.
- All data was stored accurately and retrieved successfully during testing.

These results indicate that the system is production-ready and scalable for larger organizational deployments.

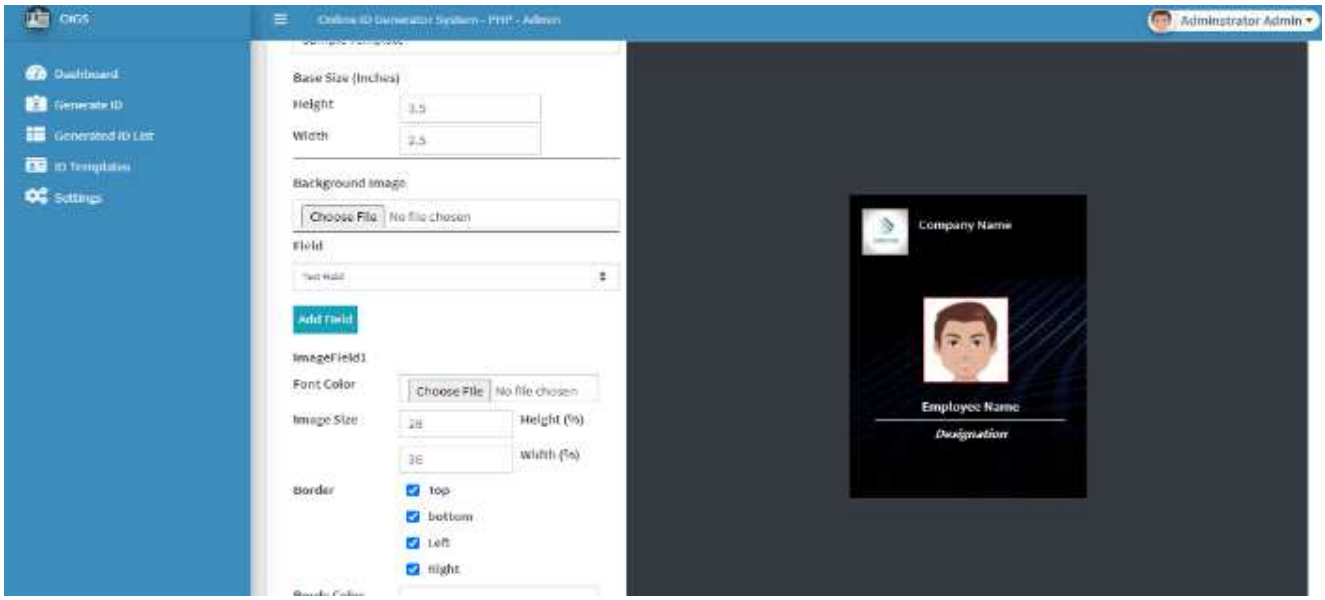

Fig 3: Admin Panel of the Online ID Generator System

Figure 3 This screenshot displays the administrative interface of the ID Card Generator System. Key features visible include:

- **Left Navigation Panel**: Provides quick access to sections like Generate ID, Generated ID List, ID Templates, and Settings.
- **Template Design Panel**: Allows admins to define the card size (in inches), upload a background image, and add various fields dynamically using text inputs or image uploads.
- **Live Preview Panel**: Shows a real-time preview of the ID card being designed. The preview includes fields such as company logo, employee image, employee name, and designation.
- **Custom Styling Options**: Admins can adjust font color, image size, and borders for better personalization.

This interface is user-friendly, allowing non-technical users to generate professional ID cards without external design tools.

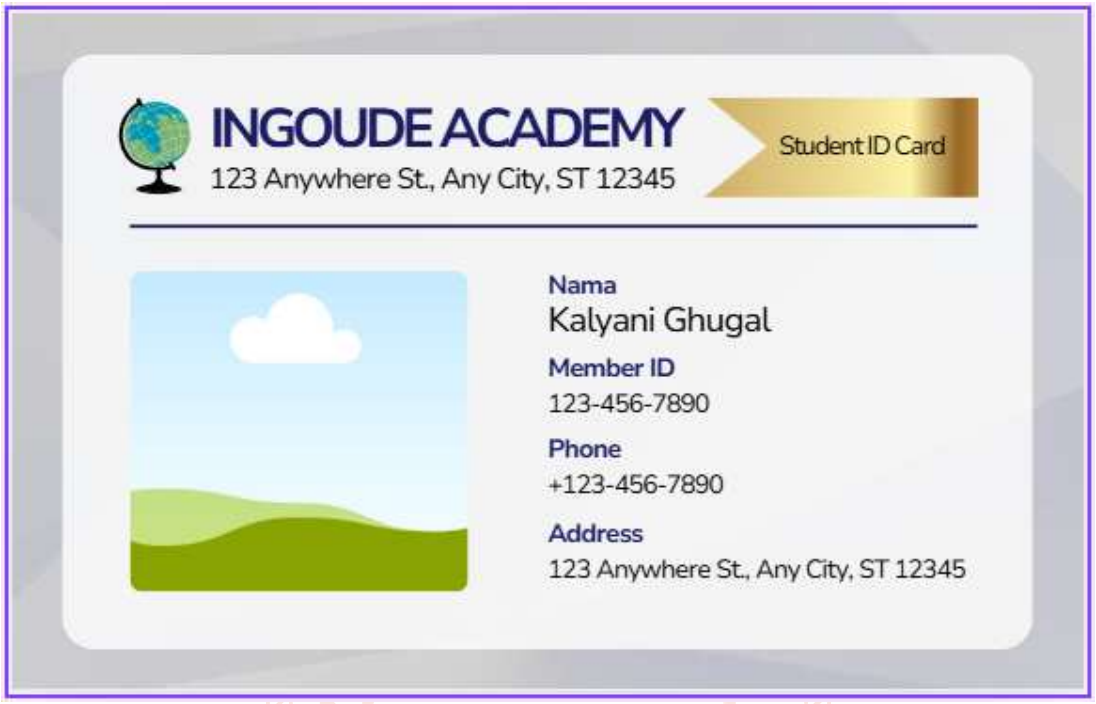

Fig 4: Sample Student ID Card – INGOUDE ACADEMY

Fig 4. This image presents a sample student ID card generated using the system. It includes:

- **Institution Branding**: Features the logo and name of "INGOUDE ACADEMY" prominently, along with a student ID label.
- **Student Information**: Displays personalized fields such as the student's name, member ID, phone number, and address.
- **Photo Placeholder**: A sample photo area is present to indicate where the student's profile image would appear.
- **Design Layout**: The layout is clean, with a balance between branding and student details, making it suitable for academic institutions.

This template highlights the flexibility of the system in accommodating different use cases such as schools, colleges, or training centers.

Discussion The ID Card Generator offers a practical and modern solution for ID creation. Its intuitive interface, secure backend, and scalable infrastructure make it suitable for a range of applications—from schools issuing student IDs to corporations handling employee badges.

One of the most appreciated features is the live preview and real-time editing, which reduces printing errors and improves user confidence. QR codes also add a layer of verification that aligns with current security standards.

Further improvements could include multi-language support, biometric data integration, or support for NFC cards. Since the system is modular, these features can be added with minimal disruption.

V. Acknowledgment

The ID Card Generator successfully meets its goal of simplifying and digitizing ID card generation. It combines modern web development techniques with practical features that organizations need for everyday operations.

With a flexible design, real-time editing, secure user management, and the ability to generate QR-embedded, print-ready PDFs, this system can serve a wide range of use cases. Its scalability ensures it can evolve with new technologies and user expectations.

VI. References

[1] React.js Documentation – https://reactjs.org/

[2] Node.js Documentation – https://nodejs.org/

[3] MongoDB Documentation – https://www.mongodb.com/docs/

[4] QR Code API & Libraries – https://www.npmjs.com/package/qrcode

[5] PDFKit Documentation – https://pdfkit.org/

[6] OWASP Foundation – Security Guidelines – https://owasp.org/

[7] Full-Stack Tutorials – freeCodeCamp, W3Schools, Mozilla Developer Network (MDN)

[8] Y. Gao, L. Yu, and Y. Zhang, "An intelligent web-based system for automatic identity document processing

using AI and QR codes," *IEEE Access*, vol. 10, pp. 25489–25499, 2022.

[9] A. Kumar and S. Tiwari, "Secure role-based access control for cloud-based ID card platforms," in *Proc. IEEE Int. Conf. Cloud Computing*, pp. 112–118, 2021.

[10] S. M. Hossain, "Smart ID card system using QR and biometric data for educational institutions," in *IEEE Int. Conf. ICTE*, pp. 78–83, 2020.

[11] H. Lee and J. Kwon, "Optimizing PDF generation for dynamic identity cards using Node.js frameworks," in *IEEE Conf. on Web Technology*, pp. 55–60, 2019.