QR Code Generator and Management in Google Sheets - Project Documentation

Overview

This system is designed to streamline the creation and management of QR codes for student or employee certificates directly within Google Sheets. By utilizing Google Apps Script, the system automates QR code generation based on individual data, provides a simple user interface, and enables certificate data export as a formatted PDF. This integration enhances certificate management and improves accessibility.

Key Features

- **Automated QR Code Generation**: The system generates QR codes that contain essential certificate information (such as name, ID, course, etc.) for each individual. QR codes are automatically inserted into a designated column in the spreadsheet.

- **QR Code Clearing**: A dedicated function allows users to remove all generated QR codes. A confirmation dialog ensures that QR code deletions are intentional.

- **PDF Export**: The system exports certificate data (columns A to I) as a formatted PDF. This PDF includes gridlines, and borders, and is set to A4 portrait orientation for easy printing.

- **User-Friendly Interface**: The system operates through Google Sheets with minimal user input. Users can perform actions via buttons or menu options that trigger the underlying Apps Script functions.

System Requirements

- **Google Sheets**: The system operates within a Google Sheet containing certificate data.
- **Google Apps Script**: Automates QR code generation, clearing, and PDF export within the Google Sheet.
- **Google Drive**: Required for storing generated PDF documents.
- **Access Permissions**: The system needs appropriate permissions to access Google Sheets and Google Drive.

Setup Instructions

1. **Prepare the Google Sheet**:

   - Create a new Google Sheet.
   - Populate the sheet with student or employee data, starting from row 2 (headers in row 1).
   - Ensure the sheet contains the relevant columns (e.g., Name, ID, Course, Mobile, Issue Date, Father's Name, Mother's Name). Ensure data is entered consistently.

2. **Open the Apps Script Editor**:

   - In the Google Sheet, navigate to *Extensions > Apps Script*.

3. **Paste the Code**:

   - Copy and paste the provided Google Apps Script code (refer to Appendix A) into the script editor.

4. **Save the Script**:

   - Save the script in the Apps Script editor.

5. **Create UI Elements (Optional)**:

- To create buttons for easier interaction, go to *Insert > Drawing* in the Google Sheet.
- Choose a shape (e.g., a rectangle) and draw it on the sheet.
- Add the button label (e.g., "Generate QR Code").
- Right-click the shape, select "Assign script...", and enter the function name (e.g., `generateQRCode`).
- Repeat for other functions like `clearQRCodes` and `exportSelectedColumnsToPDF`.

6. **Authorize Permissions**:

- When running the script for the first time, it will request authorization. Grant the necessary permissions for the script to operate.

7. **Run Functions**:

- **From the Apps Script Editor**: Select a function from the dropdown menu and click "Run".
- **From Google Sheet**: Click the assigned button in the sheet to execute a function.

Functions in Detail:

- **`toProperCase(str)`**
  - Converts a string to proper case, where the first letter of each word is capitalized.
  - If the input is not a string or is empty, it returns the original value.

- **`formatDate(date)`**
  - Formats a JavaScript `Date` object into `DD-MM-YYYY` format.
  - If the input is not a valid date, it returns `"N/A"`.

- **`generateQRCode()`**
  - Iterates over each row of data in the Google Sheet (starting from row 2).

- It gathers certificate details like student name, ID, course, mobile number, and issue date, then formats them.
- Constructs a verification message to encode into the QR code.
- Generates the QR code URL using QuickChart API and inserts it into column 9 as an image.

- **clearQRCodes()**
  - Clears all QR codes from column 9.
  - A confirmation dialog is displayed to ensure the user wants to clear the QR codes. If confirmed, the QR codes are deleted.

- **exportSelectedColumnsToPDF()**
  - Allows the user to export the selected columns (A to I) as a PDF document.
  - The PDF is generated with gridlines, A4 portrait size, and headers.
  - After the PDF is created, it is saved to the user's Google Drive, and a download link is provided.

Functionality Flow

1. **Generate QR Codes**:

   - **Input**: Student/employee data from the Google Sheet.
   - **Process**: Data formatting, QR code generation using the QuickChart API, and QR code insertion into the sheet.
   - **Output**: QR code images are placed in the sheet for each individual.

2. **Clear QR Codes**:

   - **Input**: User request to clear QR codes.
   - **Process**: A confirmation dialog is displayed, and upon confirmation, QR codes are removed from the sheet.
   - **Output**: QR codes are cleared.

3. **Export Data to PDF**:

   - **Input**: Data from columns A to I.
   - **Process**: Data is formatted, and a PDF is generated with gridlines and borders. The PDF is saved to Google Drive.
   - **Output**: A downloadable link to the generated PDF is provided to the user.

User Interface (UI)

- **Buttons**: UI buttons for triggering the functions (e.g., "Generate QR Code", "Clear QR Codes", "Export to PDF").
- **Confirmation Dialogs**: These prevent accidental data loss or changes (e.g., before clearing QR codes or exporting PDFs).

Error Handling

- **Missing Data**: Missing data will be replaced with "N/A" in the QR code. For example, if the 'Mobile' field is blank, "N/A" will be shown instead.
- **Invalid Date Format**: If the 'Issue Date' column contains an invalid date, an error will be logged, and the QR code for that individual will not be generated.
- **QR Code Generation Failure**: If the QuickChart API is unavailable, an alert message will notify the user, and the script will stop execution.

FAQs

- **Q: What happens if student data is missing?**
  A: Missing data is represented as "N/A" in the QR code. For example, if the 'Mobile' field is empty, it will display "N/A" for that individual.

- **Q: Can I customize the QR code data?**
  A: Yes, you can modify the `generateQRCode()` function to include or exclude

specific columns from the QR code.

- **Q: How do I download the PDF?**

  A: After the PDF is generated, a download link will be provided, allowing you to easily save it.

Acknowledgments

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