

The Development of QR-Code Preschooler Dismissal Management System using Laravel Framework

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Abstract

In the context of modern educational challenges, institutions in Alkauthar Eduquids face issues with manual preschool dismissal systems, leading to inefficiencies and safety concerns. Insights from the Alkauthar Eduquids case study reveal that a single teacher and assistant overseeing numerous preschoolers using manual processes can result in logistical delays and safety risks. Therefore, this study proposes the QR-Code Preschooler Dismissal Management System, designed to revolutionize these outdated methods by integrating web and mobile technology. The system is developed using PHP with the Laravel framework and MySQL as the database. Key features include QR-Code functionalities, supporting a more streamlined and secure dismissal experience among teachers, parents, and preschoolers. The methodology involves a prototype development process, ensuring the solution is efficient and effective. Results show that the system has successfully addressed the issues mentioned, with most respondents providing positive feedback and over 85 percent of satisfaction rate.

1. Introduction

Schools face intricate challenges involving safety, resource management, and efficiency due to the myriad interests of students, teachers, parents, and staff [1]. Recognizing the importance of safety, global organizations advocate for comprehensive solutions, including technology-driven methods. The proposed QR-Code Preschooler Dismissal Management System aims to address the inefficiencies and safety concerns in preschool settings. In the case study of Alkauthar Eduquids, the existing manual system poses risks like potential delays, carelessness, and even parental abduction threats. By integrating web-based and mobile platforms, this system seeks to automate and streamline dismissal processes, enhancing both security and operational efficiency.

The system's objectives include structured design, web-based and mobile technology development, and rigorous testing. It's designed specifically for Alkauthar Eduquids, but its broader applicability extends to preschools grappling with similar challenges. Functionality spans from user authentication to dismissal processes, with QR-Codes ensuring safety and reliability. Notably, the system's data collection and analysis features offer insights for continuous security enhancements.

The project's significance lies in its ability to transform dismissal operations, emphasizing safety, efficiency, and data-driven decision-making. By replacing manual methods with technology-driven solutions, the system streamlines processes, and prioritizes child safety, benefiting all stakeholders involved in the dismissal process.

This article consists of five sections. The first section explains the background of the project. The second section summarized the literature review. The third part describes the project methodology and the findings

from the system analysis and design. The fourth part describes the implementation and testing of the system and lastly the project summary is explained in the fifth section.

2. Related Work

This chapter provides a detailed review of the information relevant to the study, focusing on an educational materials website and the system used by the preschool. Section 2.1 emphasizes the importance of a safety system for preschoolers, especially considering risks like kidnappings or other crimes. Sections 2.2 introduce the technology components, such as QR-Codes and section 2.3 describes three related existing system.

2.1 Preschooler Safety and Dismissal Management System

The safety of preschool children is paramount, especially considering the potential risks like assault, abuse, and kidnapping, including the concerning issue of parental kidnapping. Teachers, despite their numerous roles and responsibilities, are often at the forefront of handling such sensitive situations. Recognizing these challenges, there's a growing emphasis on the need for a robust dismissal management system. Such a system would digitize processes, offering features like digital check-ins, real-time student tracking, and automated alerts, thereby minimizing risks and streamlining administrative tasks. Transitioning to such a system not only bolsters child safety but also eases the workload on educators, ensuring a focus on teaching rather than administrative duties.

2.2 QR-Code Technology

The QR (Quick Response) code, pioneered by Denso-Wave in 1994, has evolved into a transformative tool within the education sector. With its 2D barcode capabilities, QR codes accommodate a diverse range of data types, from URLs to contact information. In educational settings, these codes offer two distinct functionalities: static codes, ideal for consistent information dissemination like linking students to online portfolios, and dynamic codes, facilitating real-time adaptability such as attendance tracking.

Mobile-based applications, particularly those developed using platforms like Android Studio, have seamlessly integrated QR code functionalities to enhance educational experiences. These applications empower users to scan QR codes for tasks ranging from accessing course materials to conducting secure transactions within campus environments. Similarly, web-based applications leverage frameworks like HTML5 and JavaScript to embed QR code features, enabling instant access to resources and fostering interactive learning environments [2].

Furthermore, the convergence of Progressive Web Applications (PWAs) and QR code technology heralds a new era in educational innovation. PWAs combine web and native application attributes, offering enhanced functionalities and offline capabilities [3]. By incorporating QR codes within PWAs, educational institutions can redefine learning paradigms, facilitating interactive assignments, virtual tours, and streamlined communication channels. In essence, QR code technology continues to shape the future of education, bridging gaps, and fostering enriched learning experiences.

2.3 Existing System

There are three existing systems studied and compared to get more information in developing QR-Code Preschooler Dismissal Management System. The existing systems that will be compared are Sistem Maklumat Prasekolah Kebangsaan (SMPK), Pick-Up Line System and FID-Based Kindergarten Intelligence Security System (RF-KISS). Several existing systems provide key frameworks in the field of preschool management and the critical components of child safety during dismissal processes. Malaysia's primary database, Sistem Maklumat Prasekolah Kebangsaan (SMPK), anchors preschool management with regulated procedures. Although it centralizes information and simplifies management tasks, its multi-module design can make efficient dismissal procedures and rapid child safety actions more difficult. The Pick-Up Line System at Hamilton Elementary prioritizes child safety during pickups but struggles with efficiency due to potential congestion and manual verification problems. Additionally, the RFID-Based Kindergarten Intelligence Security System (RF-KISS) is an innovative technology system that intends to improve child safety through innovations such as RFID and IoT for real-time monitoring. However, for seamless preschool dismissal and general management efficiency, its integration and associated costs must be carefully considered.

Table 1 shows the summarization of the comparison of 3 existing systems with proposed system. Three existing systems have been examined to obtain more useful modules and features for the proposed system

development. The comparisons are between modules and features of the proposed system.

Table 1 Comparison between 3 existing systems with proposed system

Features/System	Sistem Maklumat Prasekolah Kebangsaan (SMPK)	Pick-Up Line System	RFID-Based Kindergarten Intelligence Security System (RF-KISS)	QR-Code Preschooler Dismissal Management System
User Authentication	√	X	X	√
Teacher Management	√	X	X	√
Parent Management	√	X	√	√
Dismissal	X	√	√	√
Report	√	X	√	√
Attendance	√	X	√	√
QR-Code Technology	X	X	X	√

3. System Methodology

This chapter explain the use of prototype model in this project and the activities that had been carried out. The development of QR-Code Preschooler Dismissal Management System is using this model consists eight phases which are initial requirement analysis, design, prototyping, customer evaluation, review and updation, development, testing, and maintenance. Each phase has their own deliverable. **Table 2** shows the activity and deliverables for each phase.

Table 2 Software Development activities and Deliverable

Phase	Task	Deliverable
Initial Requirement	<ul style="list-style-type: none"> • Analysis of the existing manual system in Alkauthar Eduquids. • Software requirement specification is created for the system. • Analyse the software aspects collected. 	<ul style="list-style-type: none"> • System requirement • Data flow diagram (DFD) • Entity relationship diagram (ERD) • Flowchart
Design	<ul style="list-style-type: none"> • Design the system architecture. • Design user interface. • Design database architecture. 	<ul style="list-style-type: none"> • Database schema and data dictionaries • System architecture • User interface
Prototyping	<ul style="list-style-type: none"> • Create database structure. • Develop web-based platform prototype. • Develop mobile app platform prototype 	<ul style="list-style-type: none"> • Prototype 1
Customer Evaluation	<ul style="list-style-type: none"> • User evaluation is performed. • Evaluate how customers can navigate the system while performing a task. 	<ul style="list-style-type: none"> • Complete system • Report of user evaluation

Table 2 (continued)

Phase	Task	Deliverable
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Review and Updating	<ul style="list-style-type: none"> • Evaluation from the customer is analyzed. • Prototype will be updated according to new specification from customer evaluation. 	<ul style="list-style-type: none"> • Prototype II
Development	<ul style="list-style-type: none"> • Program code is built based on the design document specification. 	<ul style="list-style-type: none"> • Program code with expected feature • Complete system database and interface
Testing	<ul style="list-style-type: none"> • Functional testing will be performed to validate the application against functional requirements and specifications. 	<ul style="list-style-type: none"> • Test report
Maintenance	<ul style="list-style-type: none"> • Launch and monitor the QR-Code Dismissal Management System. 	<ul style="list-style-type: none"> • Launched project system

3.1 System Requirement Analysis

Requirements are necessary for starting any design task because they specify the essential features of an object [4] underlines in his book that system requirement analysis is an orderly technique to identifying the resources required to meet the needs of a system. System requirements include functional and non-functional requirements, user requirements and system requirements.

3.2 Functional and Non-Functional Requirement

The way the system should work is explained by its functional requirements. Think of a functional requirement as a set of clear instructions that tell us the exact steps or actions needed to make sure something is done correctly [5]. To give a clearer picture, **Table 3** shows a list that breaks down the different modules of the system and what each part needs to do according to these requirements.

Table 3 *Functional Requirements*

No	Module	Description	User
1	User Authentication Module	<ul style="list-style-type: none"> • Administrator will register and activate all user account • Users can login by username and password and logout their session. 	<ul style="list-style-type: none"> • Administrator
2	User management Module	<ul style="list-style-type: none"> • Administrator is allowed to add, edit, and delete new teacher's information. • Teachers are allowed to change their own password. 	<ul style="list-style-type: none"> • Administrator • Teacher
3	Guardian Management Module	<ul style="list-style-type: none"> • Parents can register and delete at most two guardians. • Guardians are able to change their own password. 	<ul style="list-style-type: none"> • Parents • Guardian
4	Parent Management Module	<ul style="list-style-type: none"> • Users are able to register new account for one parent of each preschooler. • Users are allowed to create, edit, and delete parents' information. • Users are allowed to set the parent's password. 	<ul style="list-style-type: none"> • Administrator • Teacher
5	Student Management Module	<ul style="list-style-type: none"> • Users are able to register, edit, delete new students record. 	<ul style="list-style-type: none"> • Administrator • Teacher

Table 3 (Continued)

No	Module	Description	User
6	Attendance Module	<ul style="list-style-type: none"> Users are able to take preschooler attendance, view total present and absent. Users are able to check attendance report by date. 	<ul style="list-style-type: none"> Administrator Teacher
7	Dashboard Module	<ul style="list-style-type: none"> Users are able to see student to release when a QR code is successfully scanned. 	<ul style="list-style-type: none"> Administrator Teacher
8	Dismissal Module	<ul style="list-style-type: none"> Users are able to view preschooler release status. 	<ul style="list-style-type: none"> Teacher
9	Report Module	<ul style="list-style-type: none"> The user is allowed to view the release records and generate into report. 	<ul style="list-style-type: none"> Administrator Teacher

In contrast, while functional requirements detail the specific actions and procedures a system must undertake, non-functional requirements play a distinct role by setting essential criteria that evaluate the overall quality and performance of the system as a whole, rather than honing in on individual behaviors or tasks [6]. These non-functional requirements provide a broader perspective, considering aspects like system reliability, speed, usability, and security. To provide a clearer understanding of these criteria, **Table 4** meticulously showcases and elaborates on the non-functional requirements tailored for the proposed system, ensuring that both the technical team and stakeholders have a comprehensive view of the system's holistic performance expectations.

Table 4 Non - Functional Requirements

No.	Requirement	Description
1.	Performance	<ul style="list-style-type: none"> The system should be always usable. The loading time required for a website is not more than 1 minute.
2.	Operational	<ul style="list-style-type: none"> The system should always be available except for periodic maintenance. The system can be accessed even if the user changes their current device.
3.	Security	<ul style="list-style-type: none"> The system should be user friendly The system can be accessed only by authenticated users. All users can change the default password to their own.
4.	Cultural and political	<ul style="list-style-type: none"> The system should be able to work on any web browser

3.3 User Requirement Analysis

The user requirements are an important aspect of the design of information systems and are vital to the success of interactive systems. It is now widely accepted that successful systems and products begin with an understanding of the users' needs and requirements [7]. Table 5 shows the user requirements of the developed system.

Table 5 User Requirements

No.	Requirement
1.	All users must have an account with valid id and password.
2.	Administrator should be able to register the new teachers.
3.	Administrator should be able to manage the teachers registered.
4.	Teachers should be able to reset their own password.
5.	Administrator and teachers should be able to manage the parents registration.
6.	The dashboard should be able to display the dynamic QR-Code and list of preschooler name.
7.	Parents should be able to view their profile and reset the account's password.
8.	Parents should be able to register at most two guardians for their children.
9.	Parents should be able to view and remove the guardians
10.	Guardians should be able to reset their password

3.4 System Design

Following the completion of the analysis phase, the next step is methodically developing both the database and the user interface. This crucial stage provides an extensive overview of the proposed system, assuring clarity and precision before moving on to the programming phase.

3.4.1 Context Diagram

Context diagrams present the overview of interaction between the system and its user. Context diagrams also present the flow of input and output to and from its user and system which are useful in understanding the situation in which the system will operate. Figure 1 shows the context diagram of the developed system.

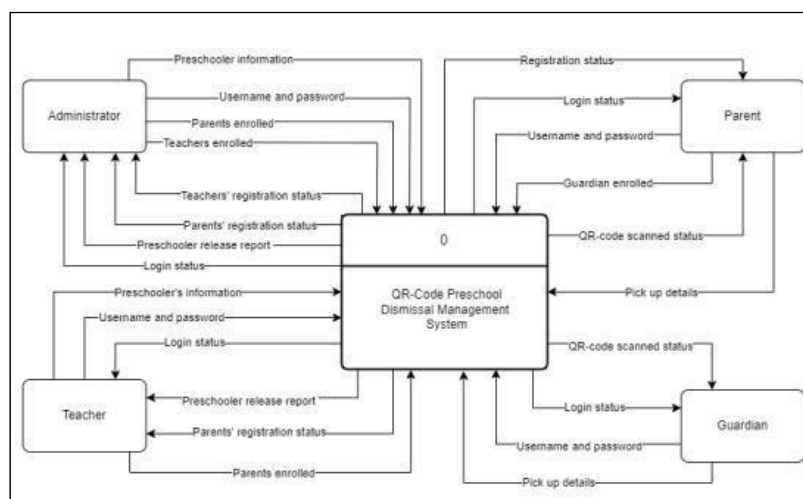


Fig. 1 Context Diagram of Proposed System

3.4.2 Data Flow Diagram (DFD)

The Data Flow Diagram (DFD) visually represents the movement of data or input from an entity through processes, leading to outputs directed towards another entity or stored in data repositories. Each entity and process within the DFD is depicted with its specific inputs and outputs. The DFD level 0 serves as a detailed context breakdown, highlighting processes, data storage locations, and data inputs or outputs. Appendix A presents the level 0 DFD for the proposed system, encompassing ten processes such as register, login, manage user, manage parents, manage students, manage guardians, take attendance, scan QR-Code, release students, and generate report.

On the other hand, the DFD level 1, referred to as the detailed data flow, offers a more granular perspective as it delves deeper into the processes outlined in the level 0 DFD. Each process from the level 0 DFD is further

dissected into intricate details within the level 1 DFD. Appendix B displays the DFD Level 1 detailing each individual process.

3.5 Entity Relationship Diagram (ERD)

Entity relationship (ER) modeling process displays the data requirements of the company's business operations in a graphical manner. The goal of this technique drawing notations is to structure and model the issue domain data requirements [8] Thus, entity relationship diagram (ERD) for proposed system is shown in Figure 2.

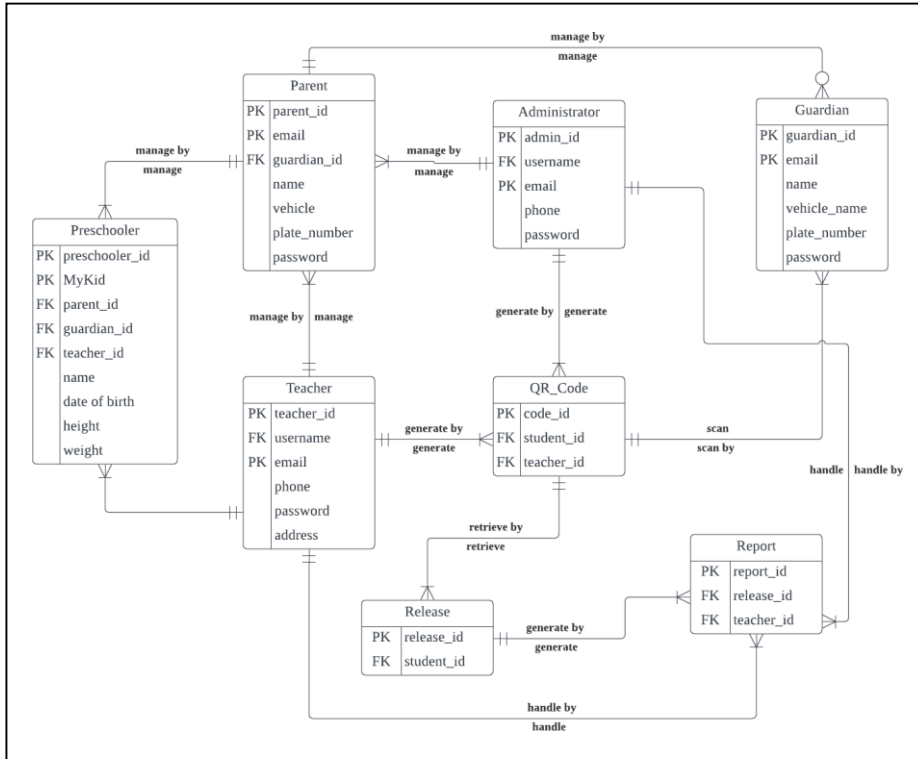


Fig. 2 Entity Relationship Diagram

3.7 User Interface Design

The purpose of interface design is to depict the flow of user activities and ensure that the interface contains elements that are easy to use, understand, and access to support those actions. These interfaces were created using the Draw.io.

In this procedure, users are required to log into the system using a designated login interface, as depicted in Figure 3(a) Upon submission, the system validates the provided email address and password. If both credentials are accurate, users are directed to the main page; however, mismatched credentials prompt an error message. Additionally, for unregistered users, the system prompts them to register, with the registration page design showcased in Figure 3(b).

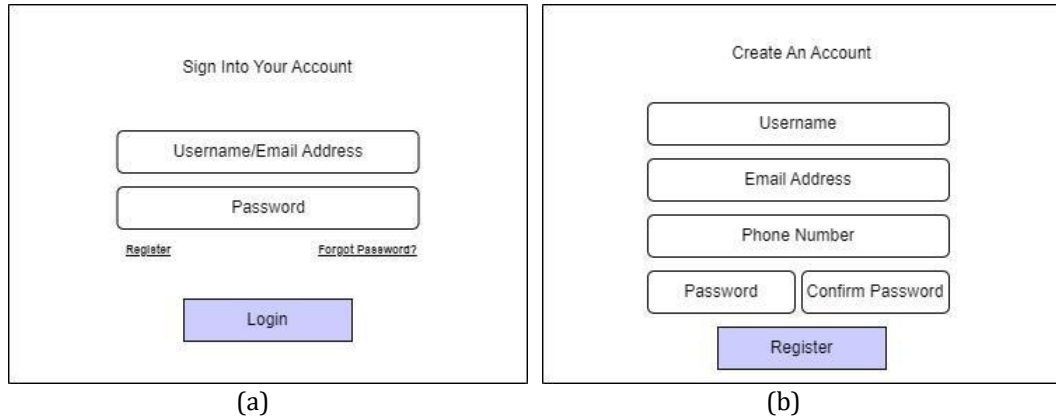


Fig. 3 (a) Login Page ; (b) Register Page

After successfully logging into the system, users are directed to the main dashboard, depicted in Figure 4(a), where preschoolers' names are displayed during the dismissal process. Additionally, users have access to a sidebar menu enabling various actions, including information management, QR-Code generation, and reporting. For instance, if an administrator intends to manage teachers, they can select the "teachers" option, illustrated in Figure 4(b).

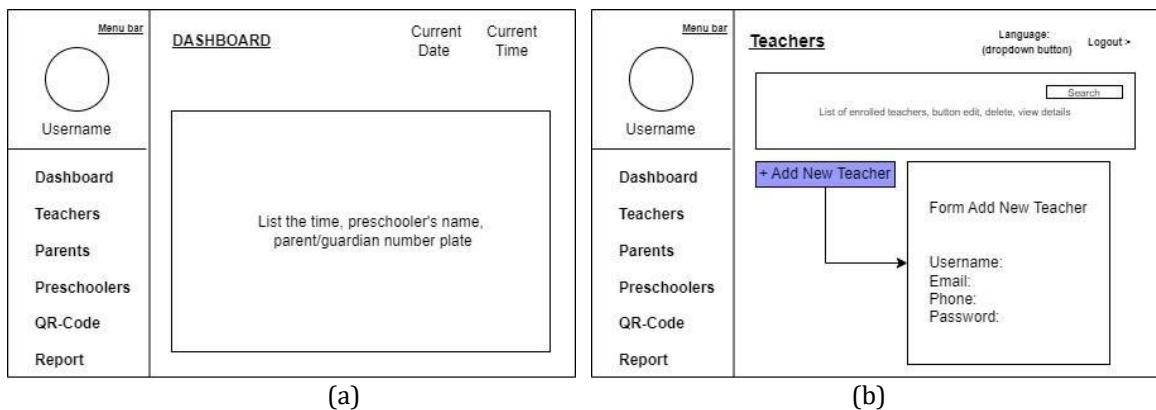


Fig. 4 (a) Main Page ; (b) Teachers Page

The page displays lists of enrolled teachers, parents, and preschoolers, with the option to add new entries. Clicking "add new teacher" redirects to the registration form. Similar pages for parents, Figure 5(a) and preschoolers, Figure 5(b) offer easy registration and viewing of enrolled individuals, each with unique attributes. The system facilitates keyword-based searches and streamlines the process by allowing users to select parents from a drop-down menu for each preschooler.

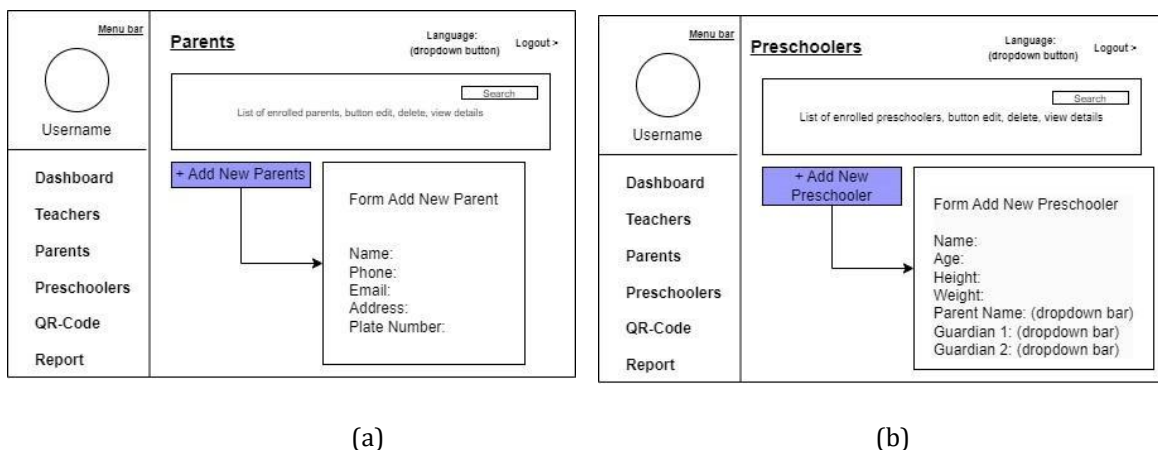


Fig. 5 (a) Parents Page ; (b) Preschoolers Page

The system offers QR-Code generation, illustrated in Figure 6(a). Furthermore, the web-based

platform includes a report page where users input a preschooler's name, start date, and end date to produce a release report for specific periods. Additionally, based on the selected time frame, the system calculates attendance, as showcased in Figure 6(b).

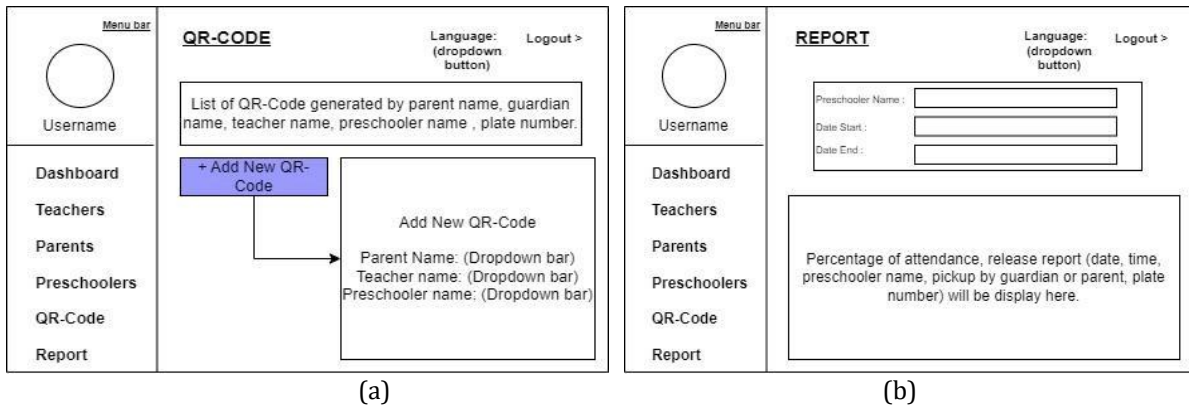


Fig. 6 (a) QR-Code Page ; (b) Report Page

The mobile platform for this system features user interface designs, including a login page and a crafted using Figma.com, as depicted in Figure 7(a).



Fig. 7 (a) Login Page

4. Result and Discussion

In this section, the result of implementation of QR-Code Dismissal Management System for Alkauthar Eduquids are shown. This including the test cases result and the result from user acceptance testing.

4.1.1 Implementation

User authentication module is allowing teachers, parents, and other guardians to login the system. Each user can access the system by entering their email address and pre-set password. Additionally, by selecting “forgot your password?”, users can reset the password. Figure 8 indicate the interface of the user authentication module.

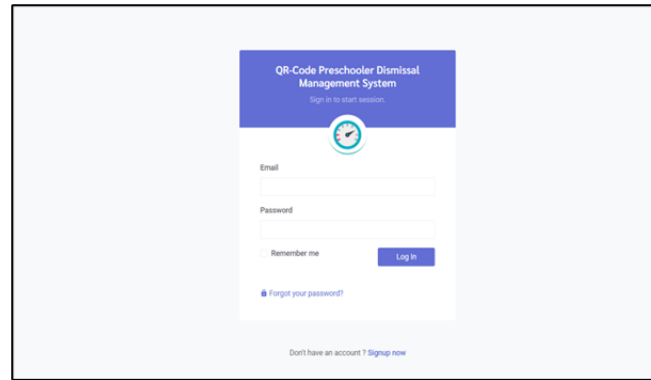


Fig. 8 The interface of user authentication module

Next, for user management module is designed to allow admin performs account registration process for all users especially teacher. All accounts of this system will be activated by users in this module. Each account can be differentiated by selecting a role during registration as a teacher, parent, or guardian. **Figure 9** indicates the interface of user management module.

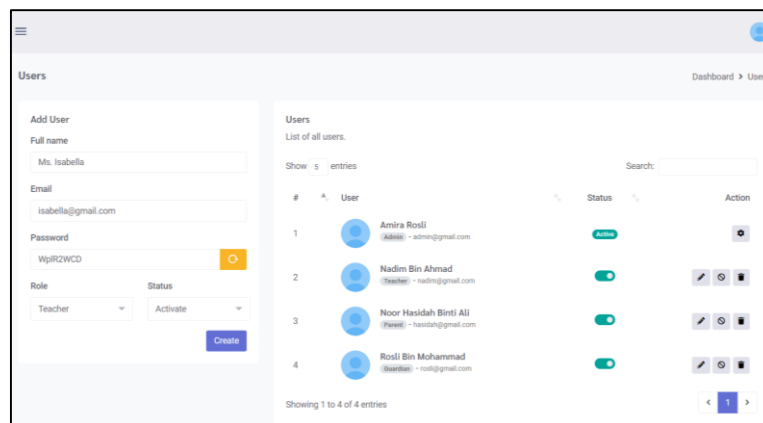


Fig. 9 The interface of user management module

Furthermore, Parents management in this module can be carried out by both admin and teachers after user accounts have been activated. Parent's and guardian's name can be selected by simply click the dropdown menu. Besides, type of vehicle that is used by the parents and the plate number are required in this module. **Figure 10** indicates the user interface of parents management module.

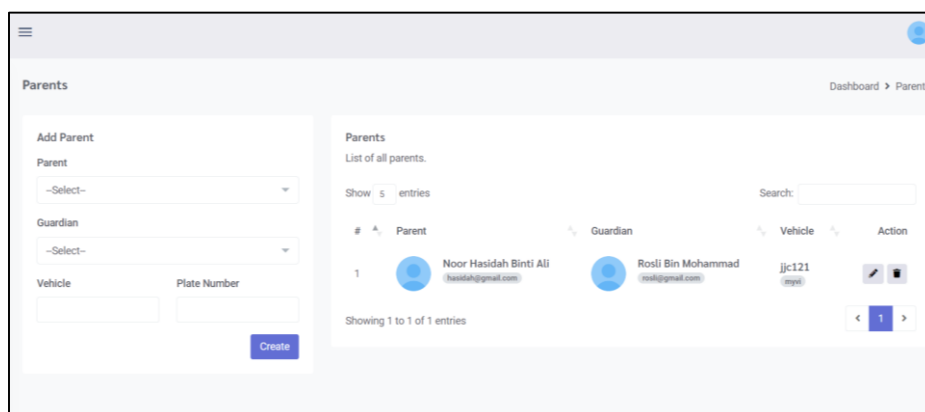


Fig. 10 The interface of parents management module

In addition, guardian management module is where guardian information such as vehicle and license plate numbers will be entered after the user account is activated by the admin. This information will be used if parents choose an alternative for other guardians to pick up their child at preschool. **Figure 11** indicates the interface of guardians management module.

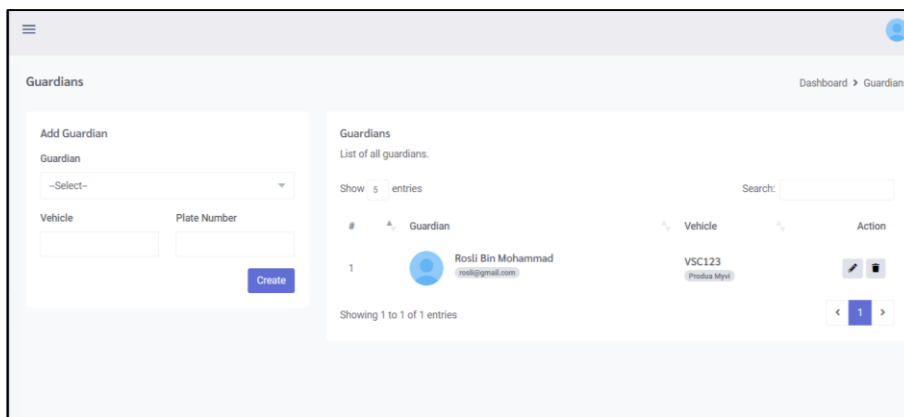


Fig. 11 The interface of parents management module

For the preschooler management module is used to register preschooler information into the system. This module can be managed by both administration and teachers. The preschooler’s full name, MyKid number, date of birth, parent’s name, and class teacher. Additionally, uploading a photo is optional. **Figure 12** indicates the interface of preschoolers management module.

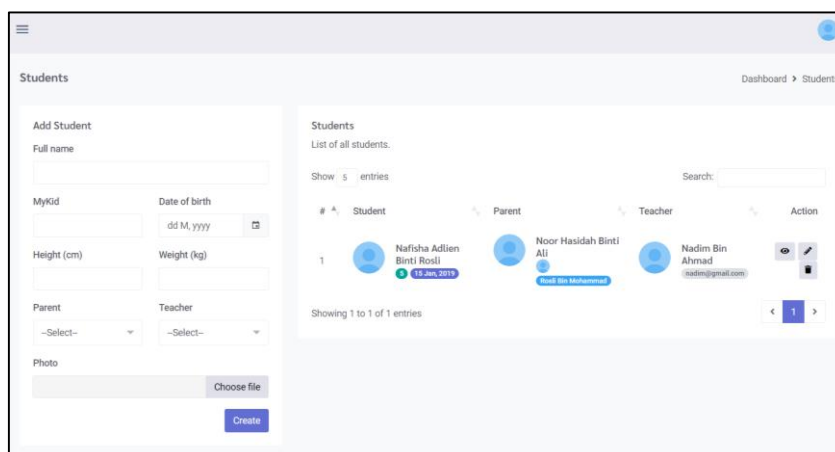


Fig. 12 The interface of preschooler management module

Apart from that, the attendance module displays list of registered preschoolers and it was implemented to simplify the process of generating a QR code release by allowing users to simply tick a checkbox. Additionally, this module can generate an attendance report for a specific date. **Figure 13** indicate the interface of the presence module.

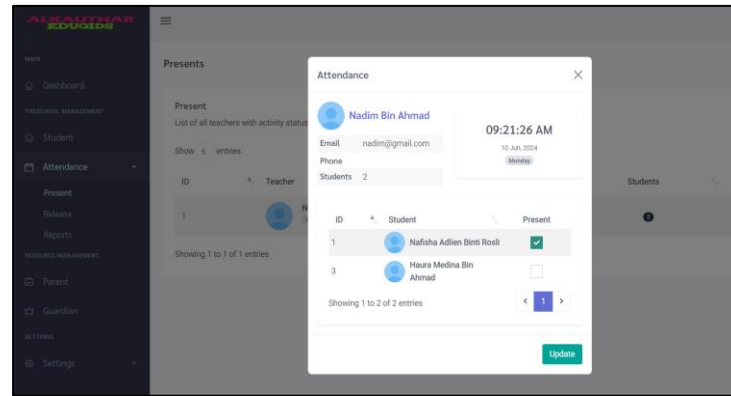


Fig. 13 The interface of attendance module

For dashboard module is designed to centralize the user management interface, including preschooler management. This module also displays a list of preschoolers waiting to be released after their parents have scanned the Qr code. **Figure 14** indicates the interface of dashboard module.



Fig. 14 The interface of dashboard module

Last but not least, report module is designed to provide a comprehensive view of the preschool preschooler dismissal process, displaying key details about each dismissal, such as the preschooler, teacher, parents, guardian, released by, vehicle information, along with date and time of release. **Figure 15** indicates the interface of report module.

ID	Student	Teacher	Relative	Released By	Vehicle	Released At
0	Alexys Grady PHD	Mrs. Shaina Padberg	Addison Bogan V	Enoy Bergnaum	DS 4 - HSGRE9B	28 Jun, 2024
2	Mariah Reinger	Mr. Cletus Skiles IV	Mr. David Gulowski	Enola Blick	Datsun 100 - OJXD77	08 Jul, 2024
5	Jerod Harvey	Miss Lillian Moen	Osbaldo Hauck	Lorray Graham III	Zotye Z300 - OIBWZ46	19 Jul, 2024
6	Eugenia O'Connell MD	Juan Gayford	Rebekah Johnson DDS	Sydney Ballstreet	Porsche Boxster - QTL705D	19 Jul, 2024
7	Vinnie Lynch	Ella Mosciski	Prof. Cedrick Collier Jr.	Gerald Maggio	Dodge Dart - GJGNABZ	15 Jun, 2024
10	Prof. Lee Aufderhar PHD	Wendy Strasin	Dave Fahney III	Prof. Cleo Boglisch	Abarth Fiat 515 - ODKXGQP	25 Jun, 2024
12	Ebony Glover	Michel Considine DVM	Prof. Melissa Collins DDS	Elouise Carroll	Ravon Matiz - PR3244D	09 Jul, 2024
47	Prof. Ines Turner	Prof. Cole Kozey	Mr. Sigrid Heathcote	Dakota Crona	Ram 3500 - 9QOYB19	06 Jul, 2024
57	D'angelo Volkman	Isabel Kautzer	Morgan Schimmel Sr.	Mr. Haleigh Kohler	Cadillac Vizion - 4J5QZNC	04 Jun, 2024
67	Wyatt Herzog	Mr. Dewayne Sporer IV	Mr. Bernardo Hackett V	Mario Cormier	Maserati Levante - ERG2SHF	20 Jun, 2024

Fig. 15 The interface of report module

4.2 System Testing

In this section, a test will be carried out to assess the functionality of each module. A User Acceptance Testing (UAT) method is utilized to perform testing.

4.2.1 Functional Testing

Table 6 *Test Cases*

No	Test Cases	Expected Outcome	Actual Outcome	Status
USER AUTHENTICATION MODULE				
1.	To test whether administrator, teachers, parents, and guardian can log in successfully with their registered credentials.	Should be able to login to their account.	As expected	Pass
2.	To test the authenticated users are granted appropriate access privileges based on their roles.	The authenticated users should be granted appropriate access privileges based on their	As expected	Pass
USER MANAGEMENT MODULE				
1.	Test to register and activate a new account for teachers, parents, and guardians.	The system should add the new user to the list.	As expected	Pass
2.	Attempt to register new user with empty or existing input for required fields (Name, password, email, etc).	The system should display appropriate error for following field form.	As expected	Pass
PARENTS AND GUARDIAN MANAGEMENT MODULE				
1.	Test the parents and guardian dropdown is populated correctly.	The parents and guardians dropdown should list all activated parents and guardians.	As expected	Pass
2.	Test creating new entry without entering vehicle and plate number.	The system should prompt the user to enter vehicle and plate number before creating the entry	As expected	Pass
3.	Verify that the system handles duplicate entries.	The system should prevent duplicate entries appropriately.	As expected	Pass
PRESCHOOLER MANAGEMENT MODULE				
1.	Test adding a new preschooler with complete details.	The system should successfully add the new preschooler and display it in the preschooler list.	As expected	Pass
2.	Test adding a new preschooler with partial details (e.g., only name).	The system should prompt the user to enter all required details (MyKid, Date of Birth, Parent).	As expected	Pass

Table 6 (Continued)

No	Test Cases	Expected Outcome	Actual Outcome	Status
3.	Test adding preschooler with same MyKid.	The system should display appropriate error.	As expected	Pass
ATTENDANCE MODULE				
1.	Verify the update button functionality	Clicking the update button should save the attendance status for all preschoolers	As expected	Pass
2.	Verify the presence and absent status after updating	After updating, the attendance status should persist and reflect correctly upon reopening the module	As expected	Pass
3.	Test selecting a date from the dropdown menu	The system should display the attendance report for the selected date	As expected	Pass
4.	Test the calculation of total present preschoolers	The total number of present preschoolers should be calculated and displayed correctly	As expected	Pass
5.	Verify the report displays data correctly for different dates	Selecting different dates from the dropdown should display the correct attendance data for each date	As expected	Pass
6.	Verify the report displays data correctly for different dates	Selecting different dates from the dropdown should display the correct attendance data for each date	As expected	Pass
DISMISSAL MODULE				
1.	Verify the release status of the present preschooler	The system should correctly update and display the release status of the present preschooler	As expected	Pass
2.	Test scanning the generated QR code	The system should correctly recognize the QR code and update the preschooler's dismissal status accordingly	As expected	Pass
3.	Test the real-time clock display	The clock should display the current date and time correctly	As expected	Pass
DASHBOARD MODULE				
1.	Verify the role-based access control	The dashboard should display different options based on the user's role and permissions	As expected	Pass
2.	Verify the notification system for QR code scans	The system should notify the user when a QR code is successfully scanned and a preschooler is added to the list	As expected	Pass

Table 6 (Continued)

4.2.2 User Acceptance Testing

User Acceptance Testing (UAT) is the final phase of software testing, where end users validate the system's functionality, usability, and compatibility. A survey is conducted using google form, 26 respondents from all users have given their

No	Test Cases	Expected Outcome	Actual Outcome	Status
REPORT MODULE				
1.	Verify the display of dismissal details	The report should display all key details about each dismissal, including preschooler, teacher, parents, guardian, released by, vehicle information, date, and time of release	As Expected	Pass
2.	Test the search functionality	The search function should filter the report accurately based on the search term entered	As Expected	Pass
3.	Verify the integration with the Dismissal Module	The report should integrate seamlessly with the Dismissal Module, accurately reflecting dismissal records	As Expected	Pass

feedback and the results are recorded as shown in **APPENDIX D**.

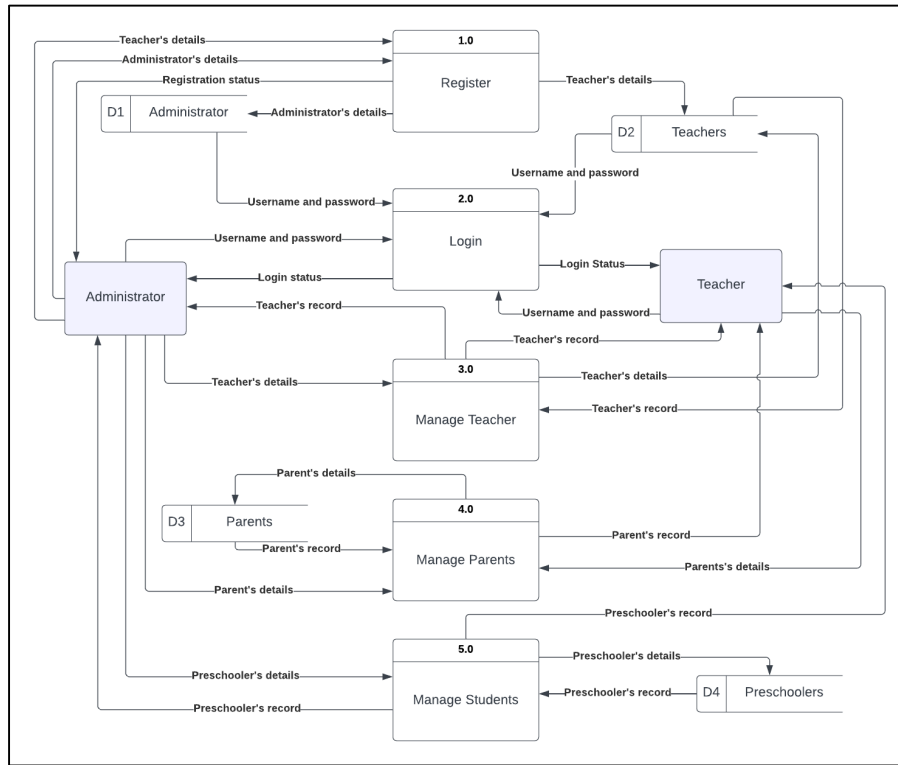
5. Conclusion

The QR-Code Preschooler Dismissal Management System is like a digital tool that helps schools keep kids safe and organized during pickup times. This system is built using modern technologies like QR codes and web-based system. By looking at other similar systems, we can see how this one improves upon them to make things smoother and safer. The design process was well thought out, using steps like making detailed diagrams and considering what users need. Overall, this system shows how technology can make release processes better, especially when it comes to kids' safety. As we move forward, it would be good to see how this system can grow and adapt to even more p and situations.

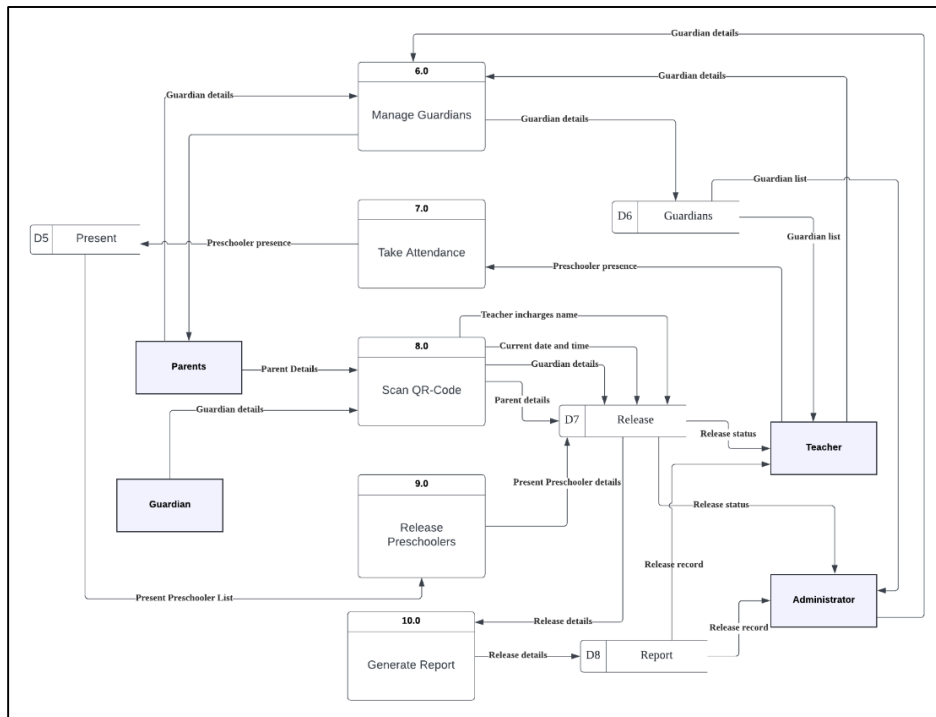
Acknowledgement

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Appendix A: DFD Level 0

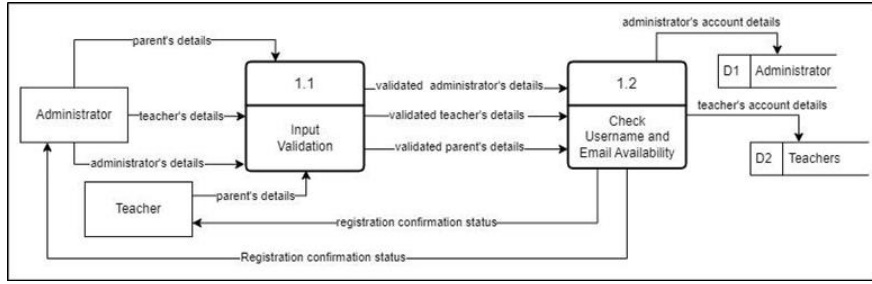


DFD Level 0 (Process 1.0 - 5.0)

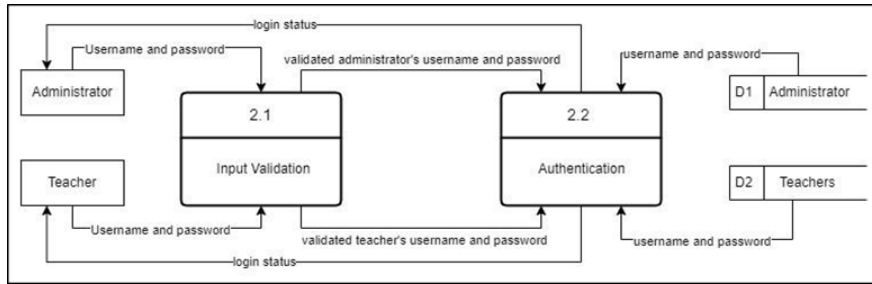


DFD Level 0 (Process 6.0 - 11.0)

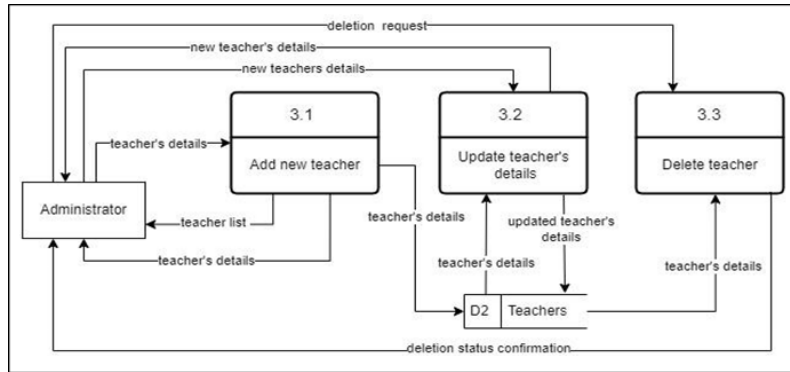
Appendix B: DFD Level 1



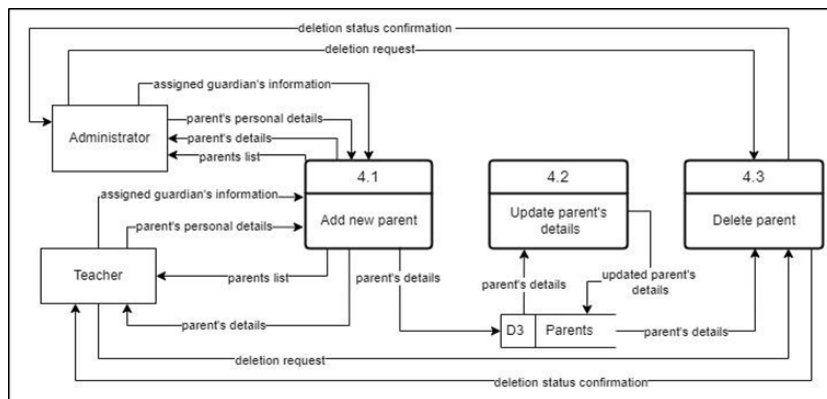
DFD Level 1 (Process 1.0: Register)



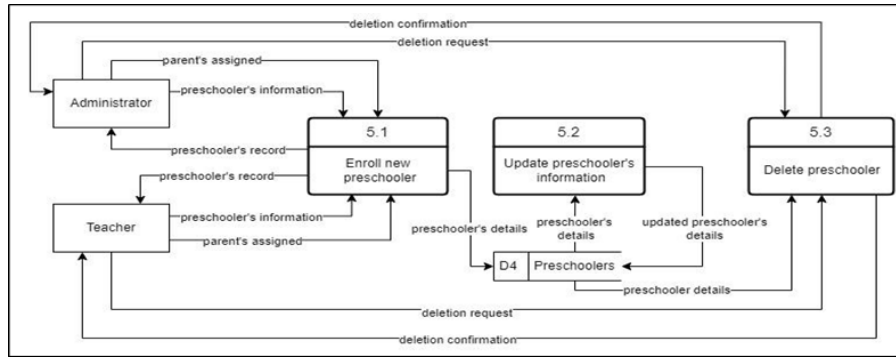
DFD Level 1 (Process 2.0: Login)



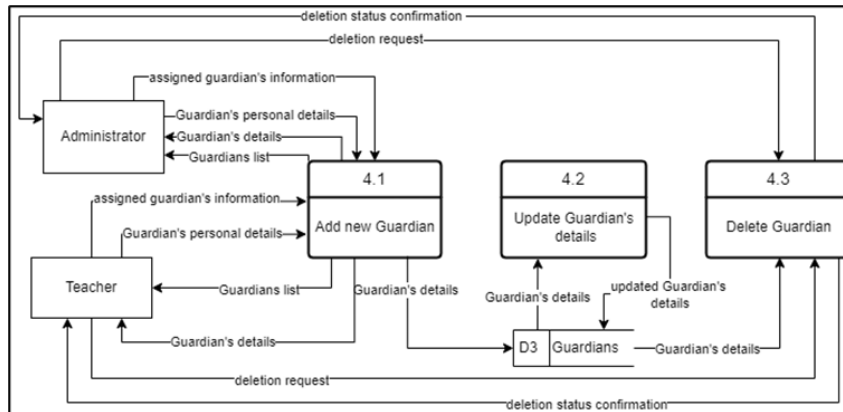
DFD Level 1 (Process 3.0: Manage Teacher)



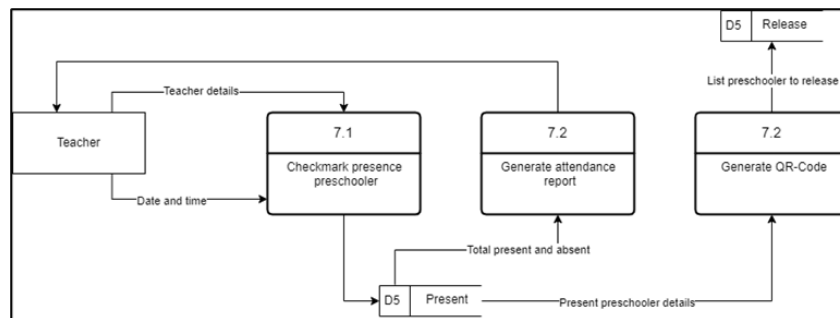
DFD Level 1 (Process 4.0: Manage Parents)



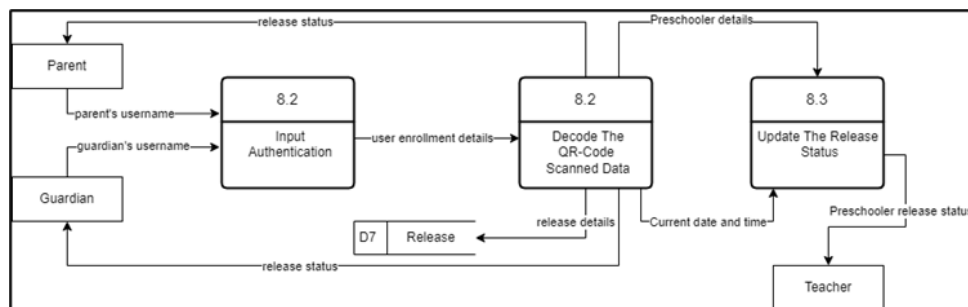
DFD Level 1 (Process 5.0: Manage Preschoolers)



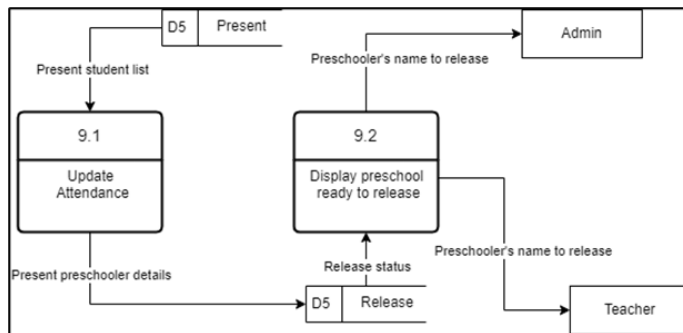
DFD Level 1 (Process 6.0: Manage Guardians)



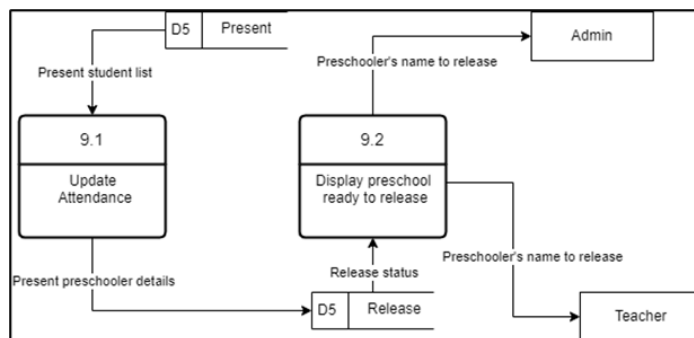
DFD Level 1 (Process 7.0: Take Attendance)



DFD Level 1 (Process 8.0: Scan QR-Code)



DFD Level 1 (Process 9.0: Release Preschooler)



DFD Level 1 (Process 10.0: Generate Report)

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