UNIVERSIDAD DE LAS FUERZAS ARMADAS ESPE
COMPUTER SCIENCE DEPARTMENT
ADVANCED WEB DEVELOPMENT
ARCHITECTURE- UNIT 1

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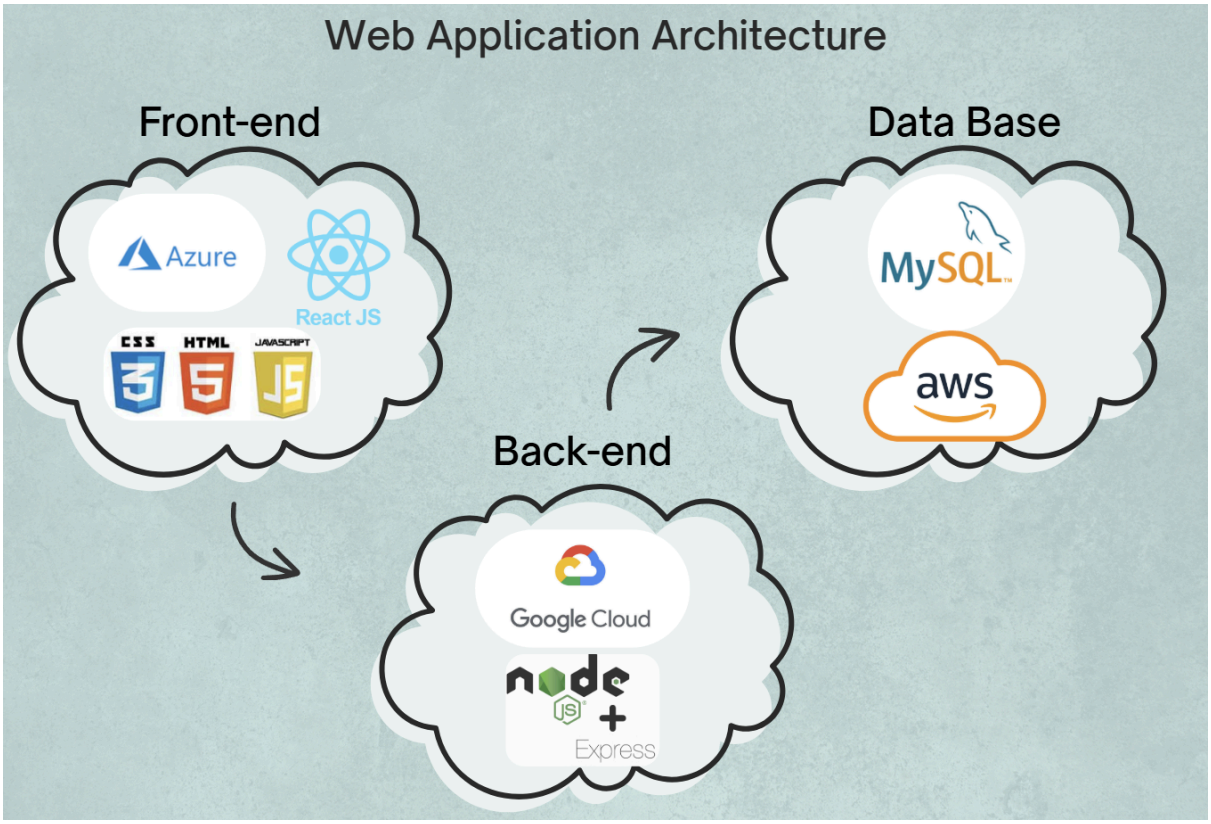

Front-end (Azure + React + HTML/CSS/JS)

Principal Function:

The Front-end is the application layer that directly interacts with the end-users: parents, teachers, and directors of the daycare. Its function is to allow each user to easily, clearly, and dynamically **view, input, and modify information**, acting as the "visual bridge" to the logic and data managed by the Back-end. It is crucial for providing the modern, responsive interface needed for tasks like real-time attendance logging and parent communication.

Key Components:

1. **HTML, CSS, and JavaScript:**
    - **HTML:** Defines the structure of all pages and forms, such such as student registration forms, notification modals, class schedules, and the specific attendance reports dashboard.
    - **CSS:** Manages the visual style, element layout on the screen, adaptability to mobile devices (**responsive design**), and the aesthetic consistency with the daycare's brand identity.
    - **JavaScript:** Adds basic interactivity, including form validations, light animations, and handling user events (clicks, submissions, option selection).
2. **React JS:**
    - **Component-Based Structure:** Allows the interface to be divided into reusable components, such as student lists, notification cards, specialized enrollment forms, and time-specific activity panels.
    - **State Management:** React controls the dynamically changing data, such as real-time attendance status, recently processed payments, or new messages from parents.
    - **Efficient Updating:** Only components that have changed are re-rendered (*Virtual DOM*), which optimizes performance and ensures a smooth user experience during high-frequency tasks like checking attendance.
3. **Azure:**
    - **Web Hosting Server:** Azure serves as the static web hosting environment, storing and delivering the compiled Front-end files (HTML, CSS, JS, and the React build).
    - It ensures **scalability, high availability, and security** without the need for a proprietary physical server infrastructure, enabling quick access for all users, regardless of their geographical location.

Back-end (Google cloud + Node.js)

English:

Using Google Cloud with Node.js for the backend of a web system —such as one for a daycare center— means leveraging Google's scalable, secure, and fully managed cloud

infrastructure. With Cloud Run or App Engine, the Node.js server can be deployed without managing physical hardware and automatically scales with activity levels.

Additionally, Cloud SQL or Firestore can handle data storage (for student and guardian information), while Cloud Storage manages file uploads. Tools like Firebase Authentication and Cloud Functions simplify user management and background automation.

Google Cloud also provides advanced security, access control, and seamless integration with other APIs, resulting in a reliable and flexible environment to develop, host, and maintain the system's backend

Spanish:

El uso de Google Cloud junto con Node.js en el backend de un sistema web —como uno para una guardería— implica aprovechar una infraestructura de nube escalable, segura y administrada por Google. Con Cloud Run o App Engine, es posible desplegar el servidor Node.js sin necesidad de gestionar hardware, escalando automáticamente según la demanda.

Además, los servicios de Cloud SQL o Firestore permiten almacenar datos (como información de alumnos y tutores), y Cloud Storage facilita guardar archivos multimedia. Herramientas como Firebase Authentication y Cloud Functions ayudan a manejar la autenticación y automatización de tareas.

Google Cloud proporciona también seguridad avanzada, control de accesos e integración con otros servicios mediante APIs. En conjunto, esta combinación ofrece un entorno confiable y flexible para desarrollar, alojar y mantener el backend del sistema.

DATABASE MySQL

The database serves as the central storage system for all daycare-related information. It maintains structured and secure records of children, parents, teachers, attendance, activities, and payments. Through a relational model, MySQL allows clear connections between these entities for example, linking each child to their class group, assigned teacher, attendance log, and parent contact details. This ensures that all daily operations, from attendance tracking to communication and billing, remain consistent and easily accessible.

MySQL (Relational Database):

- Structured Data Organization
- Data Integrity and Validation
- Efficient Information Access
- Security and Confidentiality

AWS RDS (Amazon Web Services Relational Database Service):

- Cloud Hosting and Management:
- High Availability and Scalability
- Automated Backups and Monitoring
- Seamless Integration