### 3.4.3 reCAPTCHA Integration

To enhance security and ensure that interactions on the AppointDoc platform are performed by human users, a reCAPTCHA feature was implemented on key forms such as registration, login, and appointment booking. This measure protects against automated attacks, including bot-driven account creation or data scraping.

The reCAPTCHA functionality was integrated using the Google reCAPTCHA API. On the client side, the React forms include a reCAPTCHA widget that requires users to solve a challenge before submission. Upon completion, a token is generated and sent to the backend server along with the form data. The backend verifies this token by making a POST request to Google’s API, using a secret key for validation. If the token is verified as valid, the server processes the form submission; otherwise, an error response prompts the user to retry the challenge.

This integration significantly enhances the security of the platform by preventing bot-driven attacks, thereby maintaining the integrity and confidentiality of sensitive patient information.

### 3.4.5 Terms and Conditions Page

The Terms and Conditions page was introduced to establish a transparent legal framework for the AppointDoc platform. It outlines the roles, rights, and responsibilities of users, including patients, doctors, and administrators. Acceptance of the terms is mandatory for all users to access the platform’s features.

The Terms and Conditions cover essential topics such as account registration, privacy and security, user conduct, appointment management, and dispute resolution. Patients must provide accurate personal and medical information during registration and maintain the confidentiality of their credentials. Doctors are required to verify their qualifications and provide proof of an active medical license. Administrators oversee platform functionality and ensure compliance with HIPAA regulations.

The page was implemented on the frontend using React. A scroll listener ensures users review the document fully before enabling the acknowledgment checkbox. The backend stores the user’s acceptance status, including the timestamp and version of the terms, in the MongoDB database. Updates to the terms prompt users to re-acknowledge the updated version during their next login, ensuring ongoing compliance.

By requiring users to accept the Terms and Conditions, AppointDoc strengthens its commitment to HIPAA compliance, ensuring informed consent, data protection, and legal transparency.