Here's a comprehensive overview of building a medical app with patient-doctor communication, consultation, and medicine ordering features using Flutter:

1. User Registration and Authentication:
   * Implement user registration and login functionality using Flutter and a secure authentication mechanism.
   * Allow users to create accounts, verify their email addresses, and set up their profiles.
   * Ensure secure storage and transmission of user credentials and implement appropriate authentication measures.
2. User Roles and Access Control:
   * Define user roles such as patient, doctor, and pharmacist.
   * Implement role-based access control to restrict functionalities based on user roles.
   * Determine the privileges and capabilities of each user role within the app.
3. Patient-Doctor Communication:
   * Develop a messaging system that enables secure communication between patients and doctors.
   * Implement real-time messaging using a technology like Firebase Realtime Database or Cloud Firestore.
   * Provide features like message threading, message status indicators, and multimedia message support.
   * Ensure data encryption and user privacy within the messaging system.
4. Consultation Booking:
   * Create a booking system that allows patients to schedule appointments with doctors.
   * Enable doctors to set their availability and manage their schedules.
   * Implement a user-friendly interface for patients to view available time slots and book appointments.
   * Integrate a calendar API or create a custom scheduling system to manage appointments.
5. Video/Audio Consultation:
   * Integrate a video/audio calling service like Agora, Twilio, or WebRTC to enable real-time audio/video consultations.
   * Implement features for initiating calls, managing call connections, and recording consultations.
   * Ensure secure and HIPAA-compliant audio/video transmission.
6. Prescription Management:
   * Develop a prescription management system for doctors to create and share prescriptions with patients.
   * Implement a user interface for doctors to enter prescription details, specify dosage instructions, and prescribe medications.
   * Enable doctors to generate printable prescriptions or digitally send prescriptions to patients securely.
   * Ensure compliance with relevant regulations for prescription management and data security.
7. Medicine Ordering:
   * Integrate with pharmacy APIs or partner with pharmacies to provide medicine ordering functionality.
   * Enable patients to search for medicines, view pricing and availability, and place orders within the app.
   * Implement secure payment integration for processing transactions.
   * Facilitate order tracking, notifications, and delivery updates.
8. Notifications and Reminders:
   * Implement push notifications or in-app notifications to send reminders for appointments, medicine refills, or important updates.
   * Utilize Flutter's notification libraries or cloud messaging services like Firebase Cloud Messaging.
   * Provide personalized and timely notifications to keep patients and doctors informed.
9. Data Security and Compliance:
   * Implement strong security measures to protect user data and ensure compliance with regulations like HIPAA (if applicable).
   * Encrypt sensitive data at rest and in transit.
   * Comply with privacy laws and regulations, handle user consents, and store and handle data securely.
   * Regularly perform security audits, vulnerability assessments, and code reviews to maintain a robust security posture.
10. Testing and Quality Assurance:
    * Conduct rigorous testing, including unit testing, integration testing, and end-to-end testing, to ensure the app functions as expected.
    * Perform usability testing with real users to gather feedback and improve the user experience.
    * Implement crash reporting and monitoring tools to track and resolve issues promptly.
11. Deployment and Maintenance:
    * Deploy the app to relevant platforms (iOS, Android) and app stores (Google Play Store, Apple App Store).
    * Monitor app performance, user feedback, and analytics to identify areas for improvement.
    * Continuously update and maintain the app by addressing bugs, releasing new features, and enhancing security.

Remember to consult legal and medical professionals to ensure compliance with applicable laws and regulations. Also, consider partnering with healthcare providers and pharmacies to facilitate integration and improve user experience.

Building a comprehensive medical app requires a multidisciplinary approach, involving expertise in mobile app development, backend development, UX/UI design, security, and compliance.