

Experiment	5
Aim	Create an app for MCA department using side and tabs navigation
Objective	 To Create MCA App using UI Component To Develop SideDrawer and Tabs Navigation in one application To Use 60-30-10 rule To Use Webview concept To Use Expandable Card View Concept
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Date of	27/02/2025
Submission	

Technology	Flutter
used	
Task	Create an app for MCA department using side and tabs navigation consisting of the following: 1) Faculty information with Expandable Card view 2) Department Vision and Mission with expandable Card view 3) Notification of any upcoming event (links to the website). 4) WebView 5) Feedback form along with rating
Code with proper label	main.dart
	import 'package:flutter/material.dart'; import 'package:flutter_prac5/screens/home_screen.dart';
	<pre>void main() { runApp(const MyApp()); }</pre>
	<pre>class MyApp extends StatelessWidget { const MyApp({super.key});</pre>
	<pre>@override Widget build(BuildContext context) { return MaterialApp(title: 'MCA Department App', theme: ThemeData(primarySwatch: Colors.blue, visualDensity: VisualDensity.adaptivePlatformDensity,), home: const HomePage(),); }</pre>



```
/screens/
faculty screen.dart
import 'package:flutter/material.dart';
import 'package:flutter prac5/models/faculty.dart';
import 'package:flutter prac5/widgets/faculty card.dart';
class FacultySection extends StatelessWidget {
 const FacultySection({super.key});
 @override
 Widget build(BuildContext context) {
  return ListView.builder(
   padding: const EdgeInsets.all(16.0),
   itemCount: Faculty.sampleFacultyList.length,
   itemBuilder: (context, index) {
    return FacultyCard(faculty: Faculty.sampleFacultyList[index]);
feedback screen.dart
import 'package:flutter/material.dart';
import 'package:flutter prac5/models/feedback.dart';
import 'package:flutter prac5/services/feedback service.dart';
import 'package:flutter prac5/widgets/rating bar.dart';
class FeedbackSection extends StatefulWidget {
 const FeedbackSection({super.key});
 @override
  FeedbackSectionState createState() => FeedbackSectionState();
class FeedbackSectionState extends State<FeedbackSection> {
 final formKey = GlobalKey<FormState>();
 final TextEditingController nameController = TextEditingController();
 final TextEditingController emailController = TextEditingController();
 final TextEditingController | feedbackController = TextEditingController();
 double rating = 5.0;
 bool isSubmitting = false;
 @override
 void dispose() {
  _nameController.dispose();
  _emailController.dispose();
  feedbackController.dispose();
  super.dispose();
 Future<void> submitFeedback() async {
  if ( formKey.currentState!.validate()) {
```



```
setState(() {
    isSubmitting = true;
  \});
  final feedback = UserFeedback(
   name: nameController.text,
   email: emailController.text,
   feedback: feedbackController.text,
   rating: rating,
   timestamp: DateTime.now(),
  try {
   await FeedbackService.saveFeedback(feedback);
   // Reset form
   nameController.clear();
   emailController.clear();
   feedbackController.clear();
   setState(() {
    rating = 3.0;
     isSubmitting = false;
   });
   // Show success message
   if (mounted) {
    ScaffoldMessenger.of(context).showSnackBar(
      const SnackBar(
       content: Text('Thank you for your feedback!'),
       backgroundColor: Colors.green,
      ),
    );
  } catch (e) {
   setState(() {
     isSubmitting = false;
   if (mounted) {
    ScaffoldMessenger.of(context).showSnackBar(
      SnackBar(
       content: Text('Error submitting feedback: ${e.toString()}'),
       backgroundColor: Colors.red,
@override
Widget build(BuildContext context) {
 return SingleChildScrollView(
  padding: const EdgeInsets.all(16.0),
  child: Form(
```



```
key: formKey.
child: Column(
 crossAxisAlignment: CrossAxisAlignment.start,
 children: [
  const Text(
   'We Value Your Feedback',
   style: TextStyle(
    fontSize: 24,
    fontWeight: FontWeight.bold,
   ),
  ),
  const SizedBox(height: 8),
  const Text(
   'Please share your thoughts and suggestions to help us improve.',
   style: TextStyle(
    fontSize: 16,
    color: Colors.grey,
   ),
  const SizedBox(height: 24),
  TextFormField(
   controller: nameController,
   decoration: const InputDecoration(
    labelText: 'Name',
    border: OutlineInputBorder(),
    prefixIcon: Icon(Icons.person),
   validator: (value) {
    if (value == null || value.isEmpty) {
      return 'Please enter your name';
    return null;
   },
  const SizedBox(height: 16),
  TextFormField(
   controller: _emailController,
   decoration: const InputDecoration(
    labelText: 'Email',
    border: OutlineInputBorder(),
    prefixIcon: Icon(Icons.email),
   keyboardType: TextInputType.emailAddress,
   validator: (value) {
    if (value == null || value.isEmpty) {
      return 'Please enter your email';
    if (!RegExp(r'^[\w-\]+\@([\w-]+\.)+[\w-]{2,4}\$').hasMatch(value)) {
      return 'Please enter a valid email';
    return null;
  const SizedBox(height: 16),
  TextFormField(
```



```
controller: feedbackController,
 decoration: const InputDecoration(
  labelText: 'Feedback',
  border: OutlineInputBorder(),
  prefixIcon: Icon(Icons.comment),
  alignLabelWithHint: true,
 maxLines: 5,
 validator: (value) {
  if (value == null || value.isEmpty) {
   return 'Please enter your feedback';
  return null;
 },
),
const SizedBox(height: 24),
const Text(
 'Rate your experience:',
 style: TextStyle(
  fontSize: 16.
  fontWeight: FontWeight.bold,
 ),
),
const SizedBox(height: 8),
RatingBar(
 rating: rating,
 onRatingChanged: (value) {
  setState(() {
    rating = value;
const SizedBox(height: 24),
SizedBox(
 width: double.infinity,
 height: 50,
 child: ElevatedButton(
  onPressed: isSubmitting?null: submitFeedback,
  child: isSubmitting
     ? const CircularProgressIndicator(
       valueColor: AlwaysStoppedAnimation<Color>(Colors.white),
    : const Text(
       'Submit Feedback',
       style: TextStyle(fontSize: 16),
      ),
```



```
home screen.dart
import 'package:flutter/material.dart';
import 'package:flutter prac5/screens/faculty screen.dart';
import 'package:flutter prac5/screens/feedback screen.dart';
import 'package:flutter prac5/screens/notifications screen.dart';
import 'package:flutter prac5/screens/vision mission screen.dart';
import 'package:flutter prac5/screens/webview screen.dart';
import 'package:flutter prac5/widgets/app drawer.dart';
class HomePage extends StatefulWidget {
 const HomePage({super.key});
 @override
_HomePageState createState() => _HomePageState();
class HomePageState extends State<HomePage>
  with SingleTickerProviderStateMixin {
 late TabController tabController;
 late PageController pageController;
 int currentIndex = 0;
 @override
 void initState() {
  super.initState();
  tabController = TabController(length: 5, vsync: this);
  pageController = PageController(initialPage: currentIndex);
   tabController.addListener(() {
   if (tabController.indexIsChanging) {
     onTabTapped( tabController.index);
  });
 @override
 void dispose() {
  tabController.dispose();
  pageController.dispose();
  super.dispose();
 void onTabTapped(int index) {
  setState(() {
   currentIndex = index;
   pageController.jumpToPage(index);
  });
 @override
 Widget build(BuildContext context) {
  return Scaffold(
   appBar: AppBar(title: const Text('MCA Department')),
   drawer: AppDrawer(
```



```
currentIndex: currentIndex,
     onItemTapped: onTabTapped,
   ),
   body: PageView(
     controller: pageController,
    physics: const NeverScrollableScrollPhysics(),
     children: const [
      FacultySection(),
      VisionMissionSection(),
      NotificationsSection(),
      WebViewSection(),
      FeedbackSection(),
   bottomNavigationBar: BottomAppBar(
     child: TabBar(
      controller: tabController,
      isScrollable: false,
      labelColor: Theme.of(context).primaryColor,
      unselectedLabelColor: Colors.grey,
      indicatorColor: Theme.of(context).primaryColor,
      onTap: onTabTapped,
      tabs: const [
       Tab(icon: Icon(Icons.people)),
       Tab(icon: Icon(Icons.visibility)),
       Tab(icon: Icon(Icons.notifications)),
       Tab(icon: Icon(Icons.web)),
       Tab(icon: Icon(Icons.feedback)),
notifications screen.dart
import 'package:flutter/material.dart';
import 'package:flutter prac5/models/notification.dart';
import 'package:flutter prac5/services/notification service.dart';
import 'package:flutter prac5/services/pdf viewer service.dart';
import 'package:flutter prac5/widgets/notification card.dart';
class NotificationsSection extends StatefulWidget {
 const NotificationsSection({super.key});
 @override
 _NotificationsSectionState createState() => _NotificationsSectionState();
class NotificationsSectionState extends State<NotificationsSection> {
 late Future < List < EventNotification >> notifications Future;
 @override
 void initState() {
```



```
super.initState();
   notificationsFuture = NotificationService.fetchNotifications();
 @override
 Widget build(BuildContext context) {
  return FutureBuilder<List<EventNotification>>(
   future: notificationsFuture,
   builder: (context, snapshot) {
    if (snapshot.connectionState == ConnectionState.waiting) {
      return const Center(child: CircularProgressIndicator());
     } else if (snapshot.hasError) {
      return const Center(child: Text('Failed to load notifications.'));
     } else if (!snapshot.hasData || snapshot.data!.isEmpty) {
      return const Center(child: Text('No notifications available.'));
     final notifications = snapshot.data!;
     return ListView.builder(
      padding: const EdgeInsets.all(16.0),
      itemCount: notifications.length,
      itemBuilder: (context, index) {
       final notification = notifications[index];
       return NotificationCard(
        notification: notification,
        onTap: () => PdfService.openPdfInGoogleDocs(notification.url),
vision mission screen.dart
import 'package:flutter/material.dart';
import 'package:flutter prac5/widgets/expandable info card.dart';
class VisionMissionSection extends StatelessWidget {
 const VisionMissionSection({super.key});
 @override
 Widget build(BuildContext context) {
  return SingleChildScrollView(
   padding: const EdgeInsets.all(16.0),
   child: Column(
     children: [
      ExpandableInfoCard(
       title: 'Vision',
       icon: Icons.visibility,
       initiallyExpanded: true,
       content: const Text(
        'To develop globally competent and ethical professionals in Computer
```



```
Science and Engineering and enable them to contribute to society.',
        style: TextStyle(fontSize: 16),
       ),
      ),
      const SizedBox(height: 16),
      ExpandableInfoCard(
       title: 'Mission',
       icon: Icons.rocket launch,
       initiallyExpanded: true,
       content: Column(
        crossAxisAlignment: CrossAxisAlignment.start,
        children: const [
          Text(
           '• To provide rigorous, high-standard, multidisciplinary curriculum
and innovative T-L-E-A processes and ensure a stimulating academic
environment.',
           style: TextStyle(fontSize: 16),
          SizedBox(height: 8),
          Text(
           '• To promote research and innovations through collaborations.',
           style: TextStyle(fontSize: 16),
          SizedBox(height: 8),
          Text(
           '• To develop requisite attitudes and skills, besides providing a strong
knowledge foundation.',
           style: TextStyle(fontSize: 16),
          SizedBox(height: 8),
          Text(
           '• To foster ethics and social responsibility among stakeholders and
imbibe a sense of contribution.',
           style: TextStyle(fontSize: 16),
      const SizedBox(height: 16),
webview screen.dart
import 'package:flutter/material.dart';
import 'package:webview flutter/webview flutter.dart';
class WebViewSection extends StatefulWidget {
 const WebViewSection({super.key});
 @override
  WebViewSectionState createState() => WebViewSectionState();
```



```
class WebViewSectionState extends State<WebViewSection> {
 late final WebViewController controller;
 bool isLoading = true;
 @override
 void initState() {
  super.initState();
  controller = WebViewController()
   ..setJavaScriptMode(JavaScriptMode.unrestricted)
   ..setBackgroundColor(Colors.white)
   ..setNavigationDelegate(
    NavigationDelegate(
      onPageStarted: (String url) {
       setState(() {
        isLoading = true;
       });
      onPageFinished: (String url) {
       setState(() {
        isLoading = false;
       });
     ),
   ..loadRequest(Uri.parse('https://mca.spit.ac.in'));
 @override
 Widget build(BuildContext context) {
  return Scaffold(
   body: Stack(
     children: [
      Positioned.fill(
       child: WebViewWidget(controller: controller),
      if (isLoading)
       const Center(
        child: CircularProgressIndicator(),
/widgets/
app_drawer.dart
import 'package:flutter/material.dart';
class AppDrawer extends StatelessWidget {
 final int currentIndex;
```



```
final Function(int) on Item Tapped;
 const AppDrawer({
  super.key,
  required this.currentIndex,
  required this.onItemTapped,
 @override
 Widget build(BuildContext context) {
  return Drawer(
   child: ListView(
     padding: EdgeInsets.zero,
    children: <Widget>[
      const DrawerHeader(
       decoration: BoxDecoration(
        color: Colors.blue,
       child: Column(
        crossAxisAlignment: CrossAxisAlignment.start,
        children: [
         CircleAvatar(
           radius: 40,
          backgroundImage:
NetworkImage('https://mca.spit.ac.in/wp-content/uploads/2022/12/cropped-logo-
removebg-preview-1.png'),
         SizedBox(height: 10),
         Text(
           'MCA Department',
          style: TextStyle(
            color: Colors.white,
            fontSize: 20,
      ListTile(
       leading: const Icon(Icons.people),
       title: const Text('Faculty Information'),
       selected: currentIndex == 0,
       onTap: () {
        onItemTapped(0);
        Navigator.pop(context);
      ListTile(
       leading: const Icon(Icons.visibility),
       title: const Text('Vision & Mission'),
       selected: currentIndex == 1,
       onTap: () {
        onItemTapped(1);
        Navigator.pop(context);
```



```
},
      ),
      ListTile(
       leading: const Icon(Icons.notifications),
       title: const Text('Notifications'),
       selected: currentIndex == 2,
       onTap: () {
        onItemTapped(2);
        Navigator.pop(context);
       },
      ListTile(
       leading: const Icon(Icons.web),
       title: const Text('Department Website'),
       selected: currentIndex == 3,
       onTap: () {
        onItemTapped(3);
        Navigator.pop(context);
       },
      ListTile(
       leading: const Icon(Icons.feedback),
       title: const Text('Feedback Form'),
       selected: currentIndex == 4,
       onTap: () {
        onItemTapped(4);
        Navigator.pop(context);
expandable_info_card.dart
import 'package:flutter/material.dart';
class ExpandableInfoCard extends StatelessWidget {
 final String title;
 final IconData icon;
 final Widget content;
 final bool initially Expanded;
 const ExpandableInfoCard({
  super.key,
  required this.title,
  required this.icon,
  required this.content,
  this.initiallyExpanded = false,
 });
 @override
 Widget build(BuildContext context) {
```



```
return Card(
   child: ExpansionTile(
    title: Text(
      title,
      style: const TextStyle(fontWeight: FontWeight.bold),
     leading: Icon(icon),
     initiallyExpanded: initiallyExpanded,
     children: [
      Padding(
       padding: const EdgeInsets.all(16.0),
       child: content,
faculty card.dart
import 'package:flutter/material.dart';
import 'package:flutter prac5/models/faculty.dart';
class FacultyCard extends StatelessWidget {
 final Faculty faculty;
 const FacultyCard({super.key, required this.faculty});
 @override
 Widget build(BuildContext context) {
  return Card(
   margin: const EdgeInsets.only(bottom: 16.0),
   child: ExpansionTile(
     leading: CircleAvatar(
      backgroundImage: NetworkImage(faculty.photo),
      onBackgroundImageError: ( , ) => const Icon(Icons.person),
     title: Text(
      faculty.name,
      style: const TextStyle(fontWeight: FontWeight.bold),
     children: [
      Padding(
       padding: const EdgeInsets.all(8.0),
       child: Text(
        faculty.designation,
        style: const TextStyle(fontSize: 16, fontStyle: FontStyle.italic),
        textAlign: TextAlign.center,
```



```
notification card.dart
import 'package:flutter/material.dart';
import 'package:flutter prac5/models/notification.dart';
class NotificationCard extends StatelessWidget {
 final EventNotification notification;
 final VoidCallback onTap;
 const NotificationCard({
  super.key,
  required this.notification,
  required this.onTap,
 });
 @override
 Widget build(BuildContext context) {
  return Card(
   margin: const EdgeInsets.symmetric(vertical: 8.0, horizontal: 12.0),
   shape: RoundedRectangleBorder(borderRadius: BorderRadius.circular(10)),
   elevation: 3,
   child: ListTile(
    title: Text(
      notification.title,
      style: const TextStyle(fontWeight: FontWeight.bold, fontSize: 16),
     subtitle: Text(
      notification.url,
      style: const TextStyle(color: Colors.blue),
      overflow: TextOverflow.ellipsis,
     trailing: const Icon(Icons.open in new, size: 18, color: Colors.blue),
     onTap: onTap,
rating bar.dart
import 'package:flutter/material.dart';
class RatingBar extends StatelessWidget {
 final double rating;
 final Function(double) onRatingChanged;
 const RatingBar({
  super.key,
  required this rating,
  required this.onRatingChanged,
 });
```



```
@override
 Widget build(BuildContext context) {
  return Column(
   children: [
     Row(
      mainAxisAlignment: MainAxisAlignment.center,
      children: [
       const Text('1'),
       Expanded(
        child: Slider(
          value: rating,
          min: 1,
          max: 5,
          divisions: 4,
          label: rating.round().toString(),
          onChanged: onRatingChanged,
        ),
       ),
       const Text('5'),
      ],
     Row(
      mainAxisAlignment: MainAxisAlignment.center,
      children: [
       for (int i = 1; i \le 5; i++)
        Icon(
          Icons.star,
          color: i <= rating.round()? Colors.amber: Colors.grey,
/services/
feedback service.dart
import 'package:flutter prac5/models/feedback.dart';
import 'package:shared preferences/shared preferences.dart';
class FeedbackService {
 static Future<void> saveFeedback(UserFeedback feedback) async {
   final prefs = await SharedPreferences.getInstance();
   final feedbackList = prefs.getStringList('feedbacks') ?? [];
   feedbackList.add(feedback.toString());
   await prefs.setStringList('feedbacks', feedbackList);
  } catch (e) {
```



```
throw Exception('Failed to save feedback: ${e.toString()}');
 static Future<List<String>> getAllFeedbacks() async {
   final prefs = await SharedPreferences.getInstance();
   return prefs.getStringList('feedbacks') ?? [];
  } catch (e) {
   throw Exception('Failed to get feedbacks: ${e.toString()}');
notification_service.dart
import 'package:http/http.dart' as http;
import 'package:html/parser.dart' as html;
import 'package:flutter prac5/models/notification.dart';
class NotificationService {
 static Future<List<EventNotification>> fetchNotifications() async {
  final url = 'https://mca.spit.ac.in/index.php/notifications/';
  try {
   final response = await http.get(Uri.parse(url));
   if (response.statusCode == 200) {
     var document = html.parse(response.body);
     var elements = document.querySelectorAll('.site-main p a');
     List<EventNotification> notifications = elements.map((element) {
      final title = element.text.trim();
      final link = element.attributes['href'] ?? ":
      return EventNotification(title: title, url: link);
     }).toList();
     return notifications;
    } else {
     throw Exception('Failed to load notifications');
  } catch (e) {
   print('Error fetching notifications: $e');
   return [];
pdf viewer service.dart
import 'package:url launcher/url launcher.dart';
class PdfService {
 static Future<void> openPdfInGoogleDocs(String pdfUrl) async {
  final String googleDocsUrl =
```

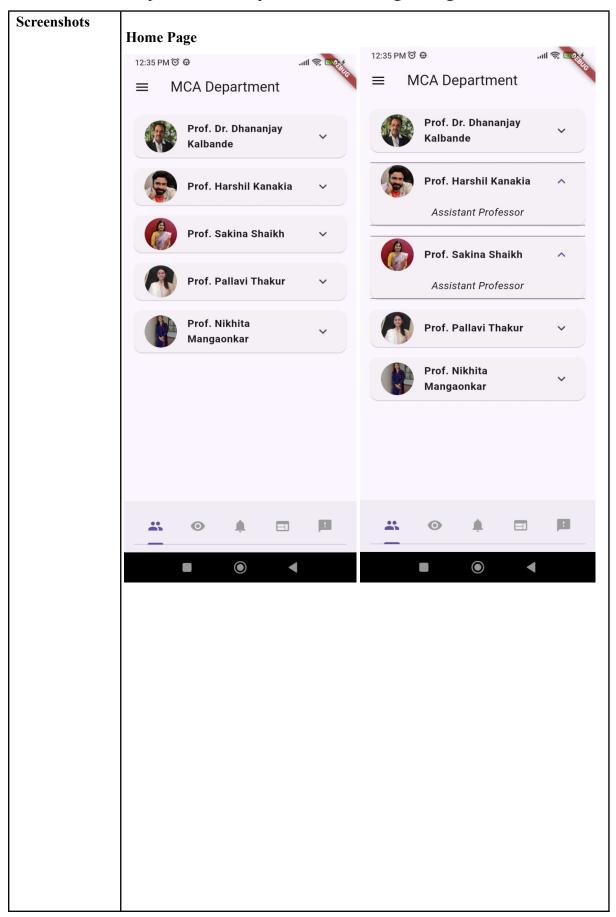


```
'https://docs.google.com/gview?embedded=true&url=$pdfUrl';
  final Uri uri = Uri.parse(googleDocsUrl);
  if (!await launchUrl(uri, mode: LaunchMode.externalApplication)) {
   throw Exception('Could not launch PDF');
/screens/
/models/
faculty.dart
class Faculty {
 final String name;
 final String designation;
 final String photo;
 Faculty({
  required this.name,
  required this.designation,
  required this.photo,
 });
 static List<Faculty> get sampleFacultyList => [
     Faculty(
      name: 'Prof. Dr. Dhananjay Kalbande',
      designation: 'Head of Department',
      photo:
'https://mca.spit.ac.in/wp-content/uploads/2023/04/dr-dhananjay-kalbande.jpg',
     Faculty(
      name: 'Prof. Harshil Kanakia',
      designation: 'Assistant Professor',
      photo: 'https://mca.spit.ac.in/wp-content/uploads/2022/12/HK.png',
     Faculty(
      name: 'Prof. Sakina Shaikh',
      designation: 'Assistant Professor',
      photo: 'https://mca.spit.ac.in/wp-content/uploads/2022/12/SK.png',
     Faculty(
      name: 'Prof. Pallavi Thakur',
      designation: 'Assistant Professor',
      photo: 'https://mca.spit.ac.in/wp-content/uploads/2022/12/PT.png',
     Faculty(
      name: 'Prof. Nikhita Mangaonkar'.
```

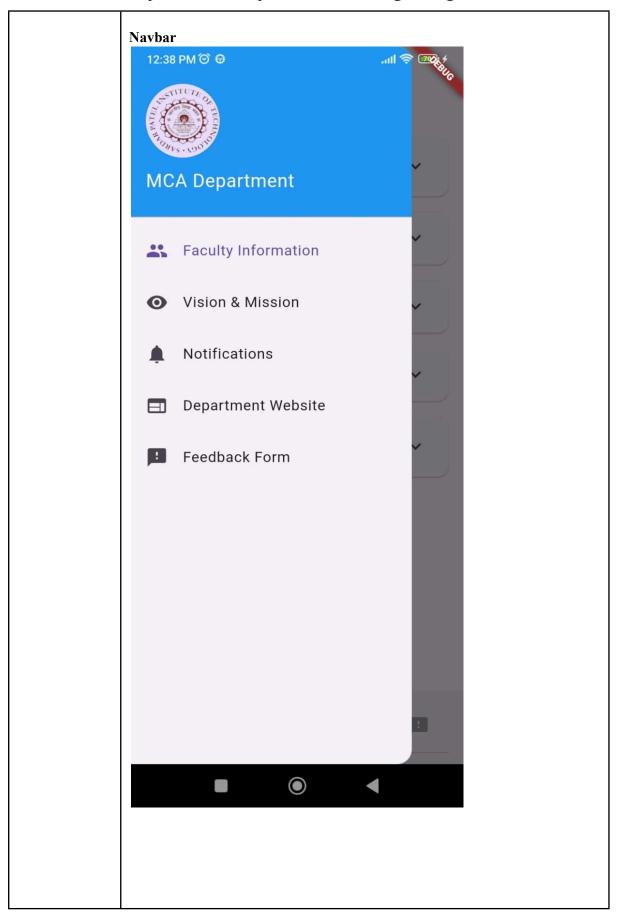


```
designation: 'Assistant Professor',
      photo: 'https://mca.spit.ac.in/wp-content/uploads/2022/12/NM.png',
     ),
   ];
feedback.dart
class UserFeedback {
 final String name;
 final String email;
 final String feedback;
 final double rating;
 final DateTime timestamp;
 UserFeedback({
  required this.name,
  required this.email,
  required this.feedback,
  required this.rating,
  required this.timestamp,
 Map<String, dynamic> toMap() {
  return {
   'name': name,
   'email': email,
   'feedback': feedback,
   'rating': rating.toString(),
   'timestamp': timestamp.toIso8601String(),
 @override
 String toString() {
  return toMap().toString();
}
notification.dart
class EventNotification {
 final String title;
 final String url;
 EventNotification({required this.title, required this.url});
```

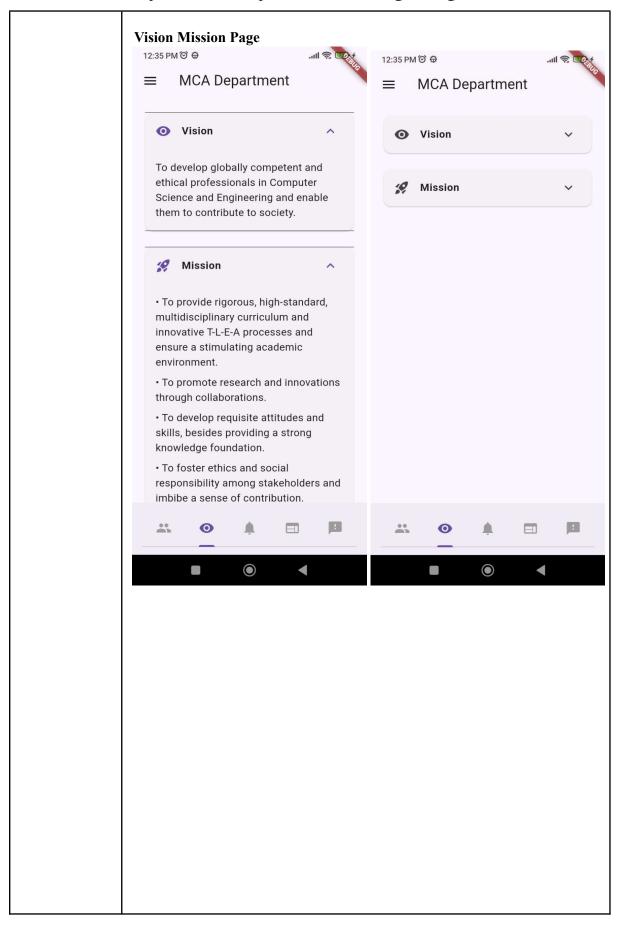




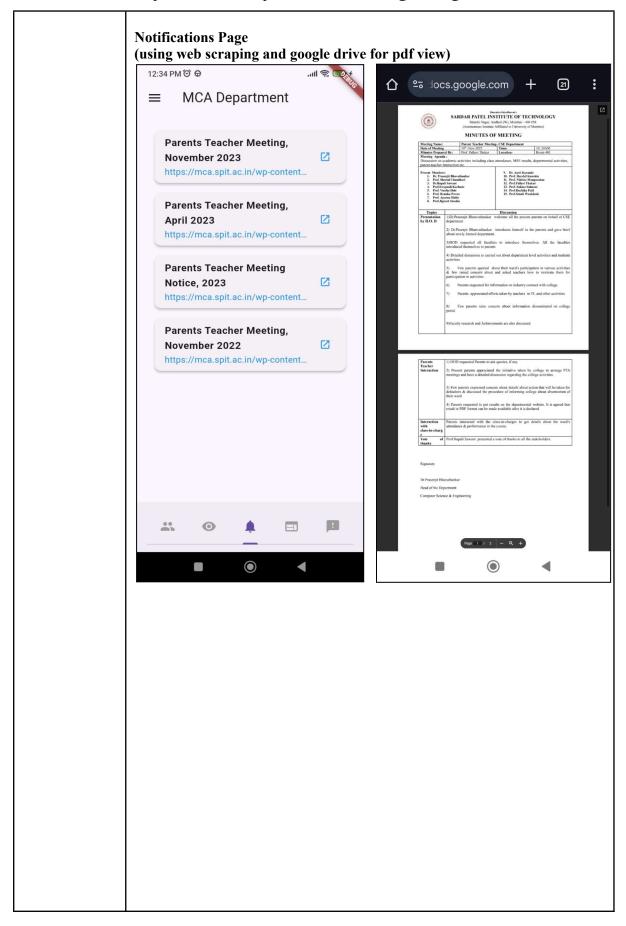








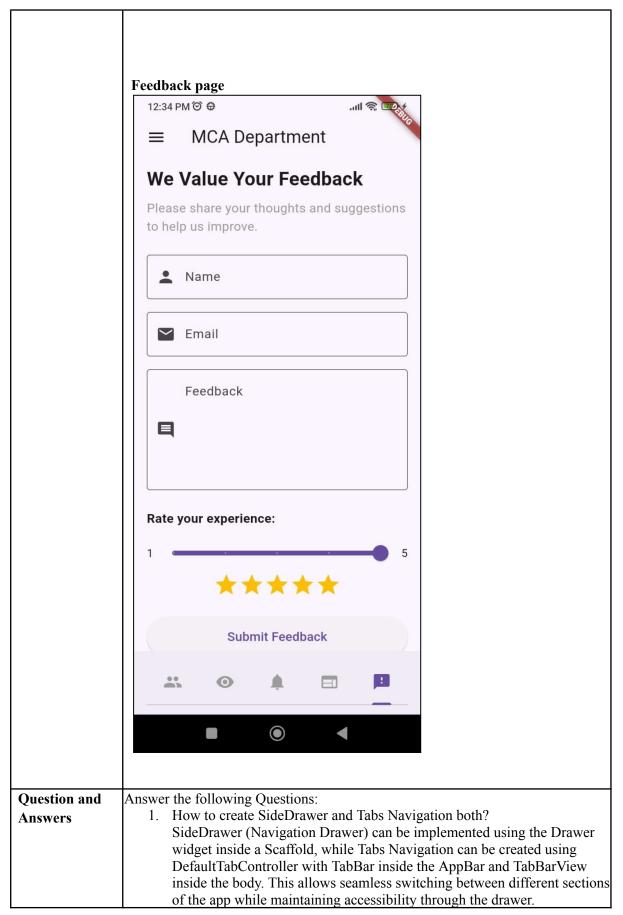














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- 2. How did you use 60-30-10 rule in your application? The primary color (60%) is applied as the main background color using the colorScheme in the theme, ensuring consistency. The secondary color (30%) is used for key UI elements such as buttons, the app bar, and navigation components. The accent color (10%) is used for highlights, such as icons, text accents, or borders, to create contrast and enhance visibility.
- 3. Which new elements did you use for creating UI components?

 The application includes UI elements like ExpansionTile for expandable cards, WebView for displaying external content, Drawer for side navigation, TabBar for tabbed navigation, flutter_rating_bar for user feedback, and file_picker for handling file uploads. These elements enhance interactivity and improve user experience.
- 4. In pubspec.yaml file, what dependencies need to be there? The necessary dependencies include url_launcher for opening external links, webview_flutter for embedding web pages, flutter_rating_bar for ratings, and file_picker for selecting files. These dependencies ensure smooth implementation of required functionalities within the app.
- 5. How to create Expandable view?
 An expandable view can be implemented using widgets like
 ExpansionTile or ExpansionPanelList, which allow sections of content to
 be collapsed and expanded dynamically. These widgets help in organizing
 information efficiently and enhancing the readability of the app's content.
- 6. How to create Webview?

 A WebView can be implemented using the webview_flutter package, which allows embedding web content inside the app. By setting the initialUrl to the required website and enabling JavaScript support, users can access external pages seamlessly within the app.

Conclusion

Through this project, I have learned how to effectively implement both SideDrawer and Tabs Navigation to create a seamless user experience. I gained the 60-30-10 color rule's importance in maintaining a visually appealing UI. Additionally, I explored new UI components like ExpansionTile, WebView, Drawer, and TabBar, enhancing my ability to structure and organize content dynamically. Working with pubspec.yaml dependencies helped me integrate external functionalities such as file handling, web embedding, and URL launching. Finally, implementing expandable views and WebView strengthened my skills in creating interactive and informative sections within the app.