

**WebX Mini Project**

# **MICROSCOPE BOOKING SYSTEM**

**Your Lab. Your Time. Your Microscope.**

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# PROBLEM STATEMENT

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## The Problem We Aim to Solve

- Manual microscope reservations cause confusion and scheduling conflicts.
- Lack of centralized tracking leads to inefficient usage.
- Students often face double bookings or long waiting times.
- No automated reminder or usage history tracking.



# OBJECTIVES

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➤ **Automate Microscope Booking Process**

Provide an online platform where users can easily reserve microscopes without manual intervention

➤ **Real-Time Availability Tracking**

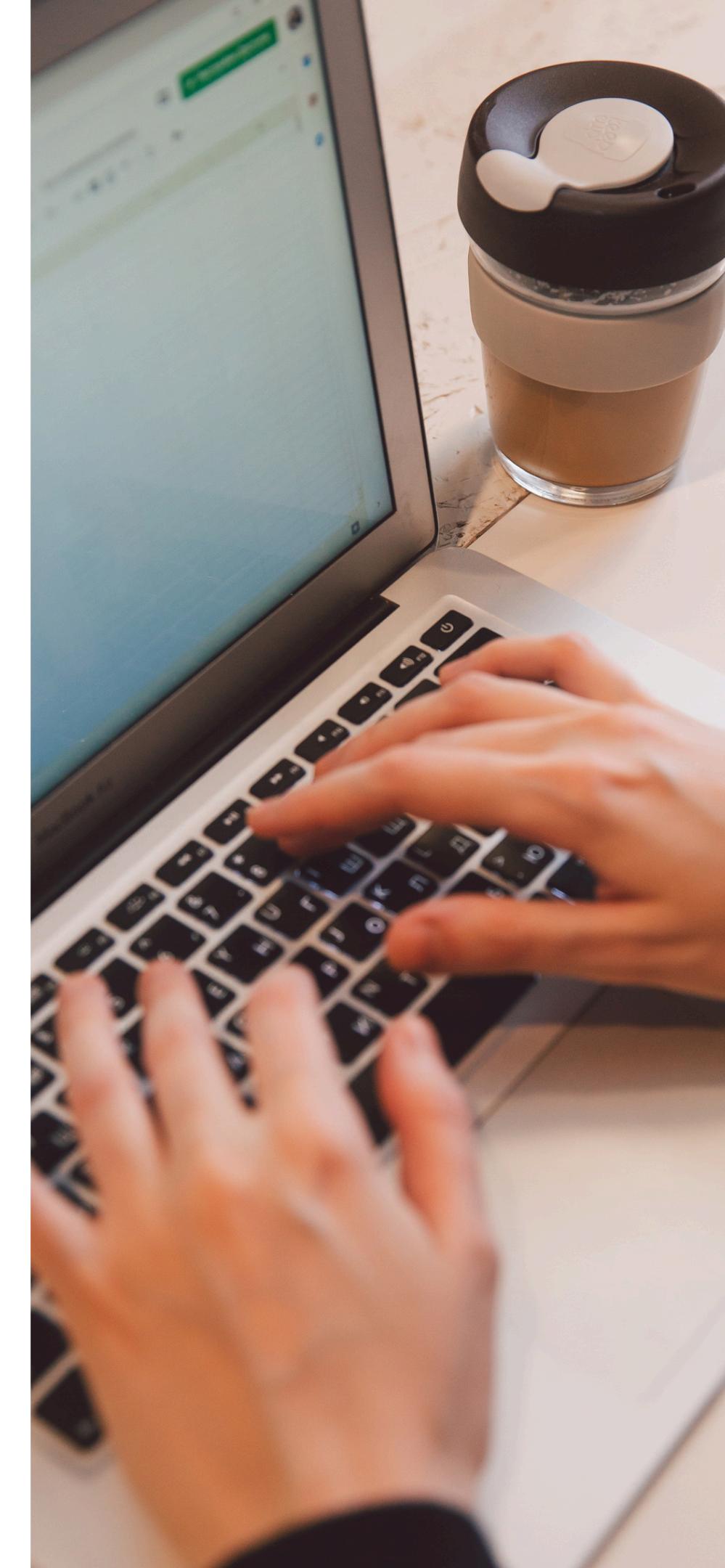
Users can view available slots in real-time, ensuring transparency and preventing double bookings.

➤ **Ensure Secure Access with OTP Verification**

Add a layer of authentication using one-time passwords via email for safe and verified login/registration.

➤ **Manage Bookings with Date & Time Filtering**

Allow users to book slots for specific dates and time ranges, and view their upcoming reservations.



# KEY FEATURES

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**Users can select available dates and time slots for a specific microscope, ensuring accurate reservations.**



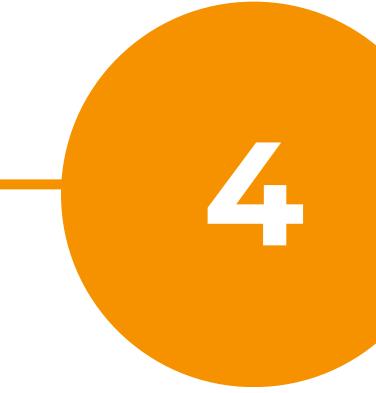
**Secure registration and login using one-time password verification sent to the user's email.**



**A well-organized homepage that displays all available microscopes along with images, types, and descriptions.**



**Users can track their upcoming and past bookings, update them, or cancel if needed.**



**Backend checks prevent overlapping or double bookings of the same microscope and slot.**



# TECHNOLOGY STACK

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## FRONTEND

HTML

CSS

JavaScript

Jinja Templates

Axios (for HTTP  
requests)

## BACKEND

Flask  
(Python)

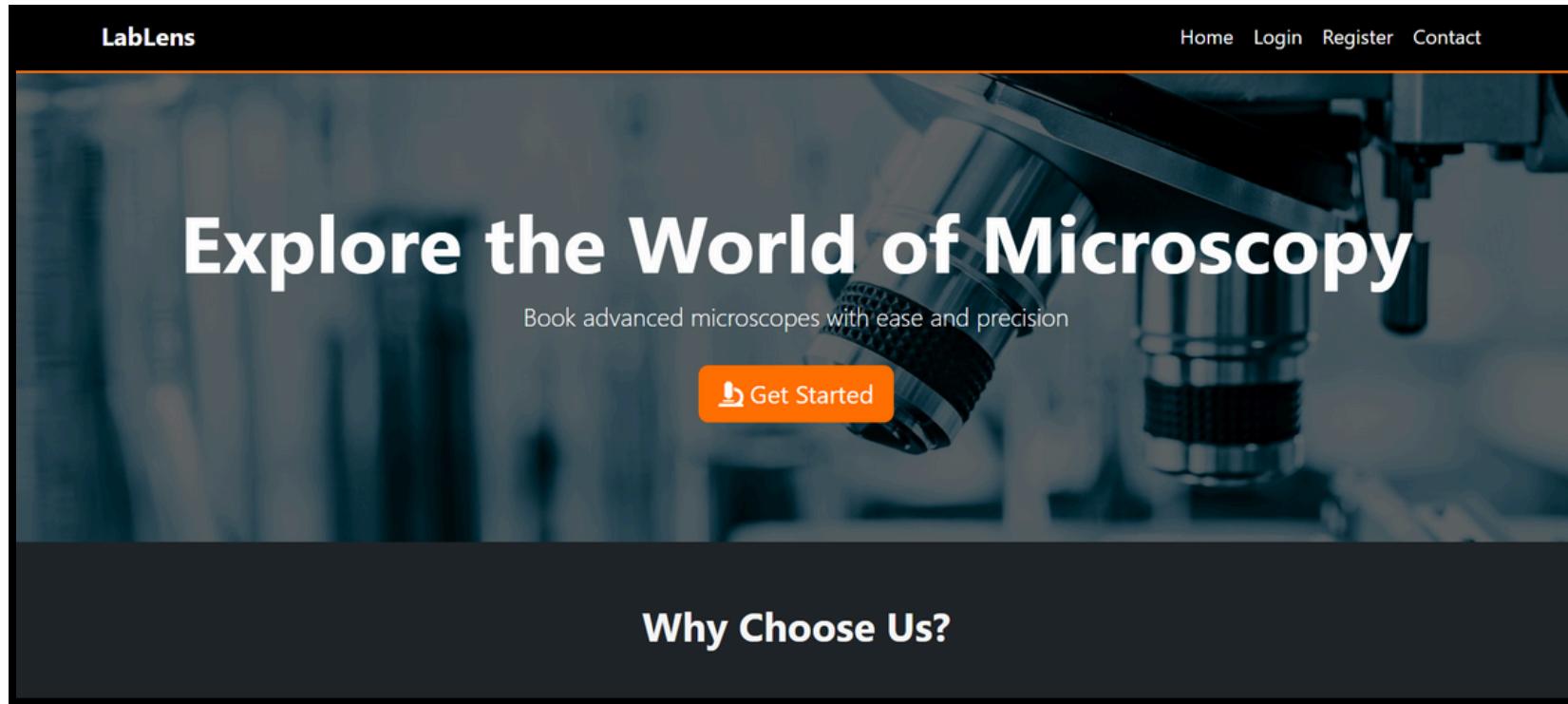
## Authentication

Flask-Login  
OTP via Email  
(SMTP)

## DATABASE

MongoDB  
Atlas

# IMPLEMENTATION



## Home page

Displays an overview of the system with a welcome message, navigation bar, and a preview of available microscopes. Users can log in or register from here.

## Microscopes

Displays detailed information about each microscope including its name, type, description, and availability.

A screenshot of a specific microscope details page. At the top, there is a "Back to All Microscopes" link. The main image shows a complex scientific instrument, identified as an Electron Microscope, with multiple monitors displaying data. To the right of the image, there is a section titled "Interested?" with a "Login to Book" button. Below the image, the microscope is labeled "Electron Microscope" and described as "Ultra-high resolution imaging for nanoscale structures". There is also a "Specifications" section with details like "Type: Transmission" and "Location: Room 102". On the far right, there is a "Operation Hours" section showing availability times for Monday through Sunday, and a "Support" section with contact information including a phone number and email address.



LabLens

Home Login Register Contact

### Login

Email address

Password

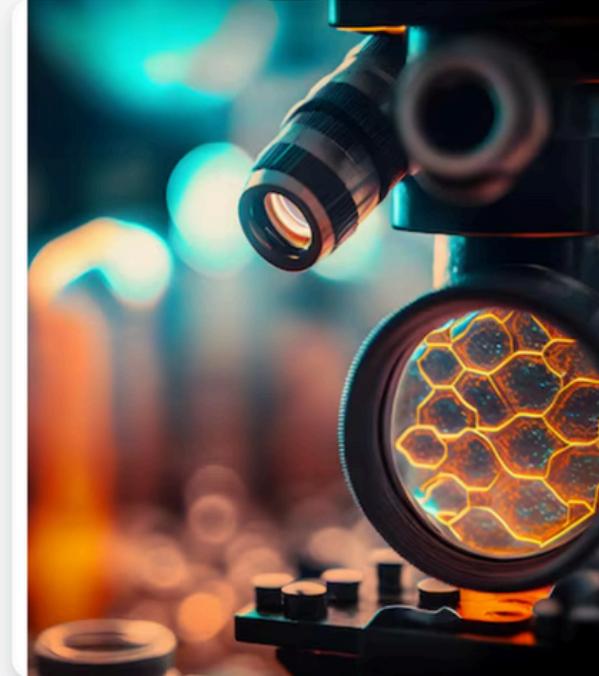
Don't have an account? [Register here](#)

## Login Page

Allows registered users to log in using their email and password. After login, an OTP is sent for verification before accessing the dashboard

## Registration Page

New users can create an account by entering their name, email, and password. After registration, they're redirected to OTP verification.



### Register

Full Name

Email address

Password

Already have an account? [Login here](#)

The dashboard features a sidebar with 'Dashboard', 'My Bookings' (selected), 'Book New Slot', and 'View Microscopes'. The main area is titled 'My Bookings' with sections for 'Next Booking' (Electron Microscope - Apr 18, 2025, 09:00 AM), 'Total Bookings' (12), 'Status Breakdown' (Confirmed: 8, Cancelled: 1), and 'Most Used Microscope' (Confocal Microscope). Below is a table of booking details:

Microscope	Date	Start Time	End Time	Status	Edit	Delete
Confocal Microscope	2025-04-18	16:21	19:21	confirmed	<input checked="" type="checkbox"/>	
Electron Microscope	2025-04-18	16:13	16:48	confirmed	<input checked="" type="checkbox"/>	
Electron Microscope	2025-04-18	09:50	10:50	confirmed	<input checked="" type="checkbox"/>	
Electron Microscope	2025-04-19	02:53	03:53	confirmed	<input checked="" type="checkbox"/>	

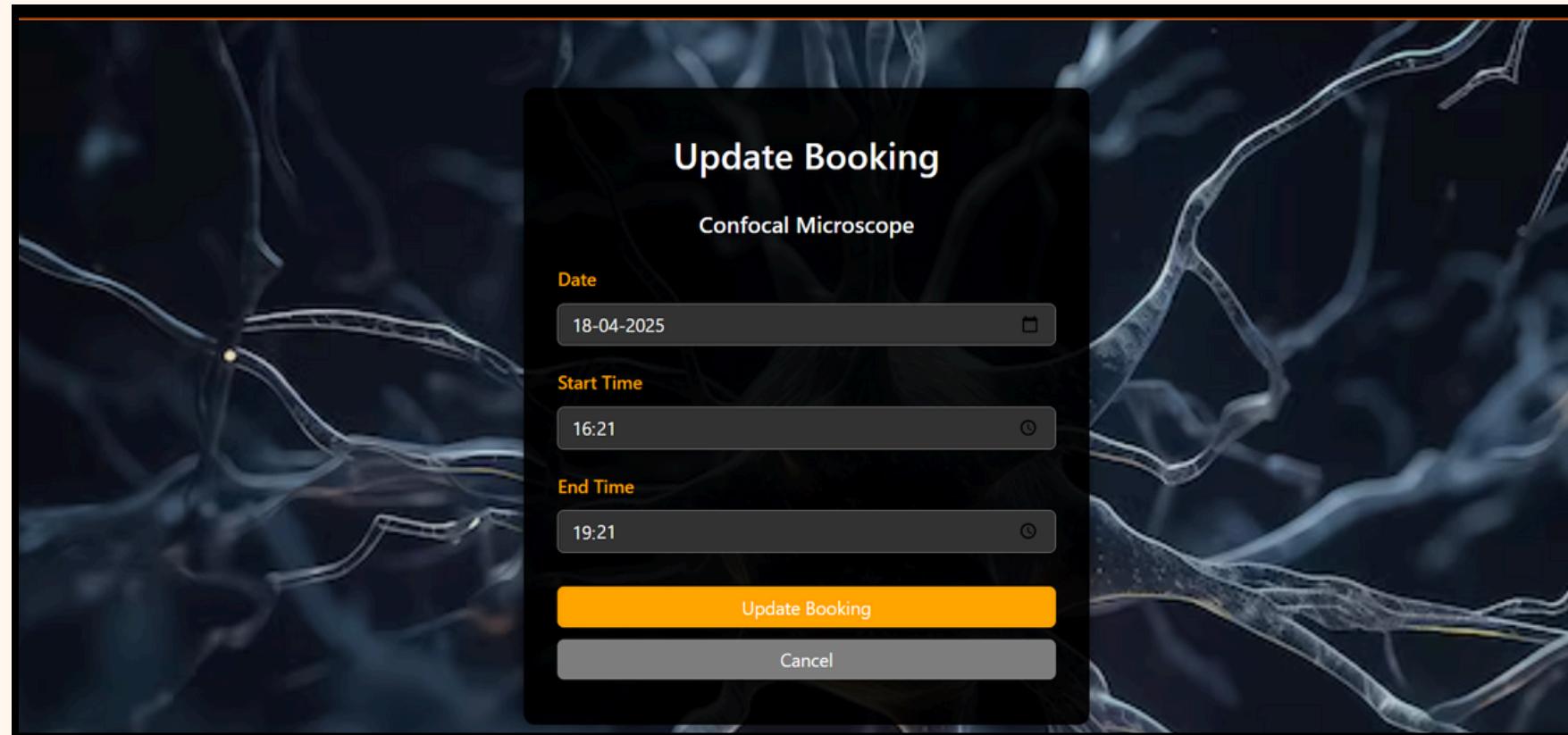
## Slot booking

Users can book a microscope by selecting a model, date, and time. The system checks for slot availability before confirming the booking.

## Dashboard

After logging in, users can view, update, or cancel their bookings. It also shows a summary of all upcoming reservations.

The booking interface is titled 'Book Microscope Slot' under 'LabLens'. It includes fields for 'Select Microscope' (Fluorescence Microscope (Widefield)), 'Date' (18-04-2025), 'Start Time' (12:29) and 'End Time' (13:29), and a large orange 'Book Slot' button. The footer contains links for 'WebX Microscope', 'Quick Links' (Home, Book a Microscope), and 'Contact Us' (address: 123 Science Ave, Research Park, phone: +1 (555) 123-4567).



## Update Booking

After logging in, users can view, update, or cancel their bookings. It also shows a summary of all upcoming reservations.

## Cancel Booking

Allows users to cancel an existing microscope booking directly from the dashboard.

A screenshot showing a confirmation dialog box titled 'localhost:5000 says' asking 'Are you sure you want to cancel this booking?' with 'OK' and 'Cancel' buttons. In the background, there is a table of booking history. The table has columns for 'Instrument', 'Date', 'Start Time', 'End Time', and status indicators ('confirmed' or 'cancelled').

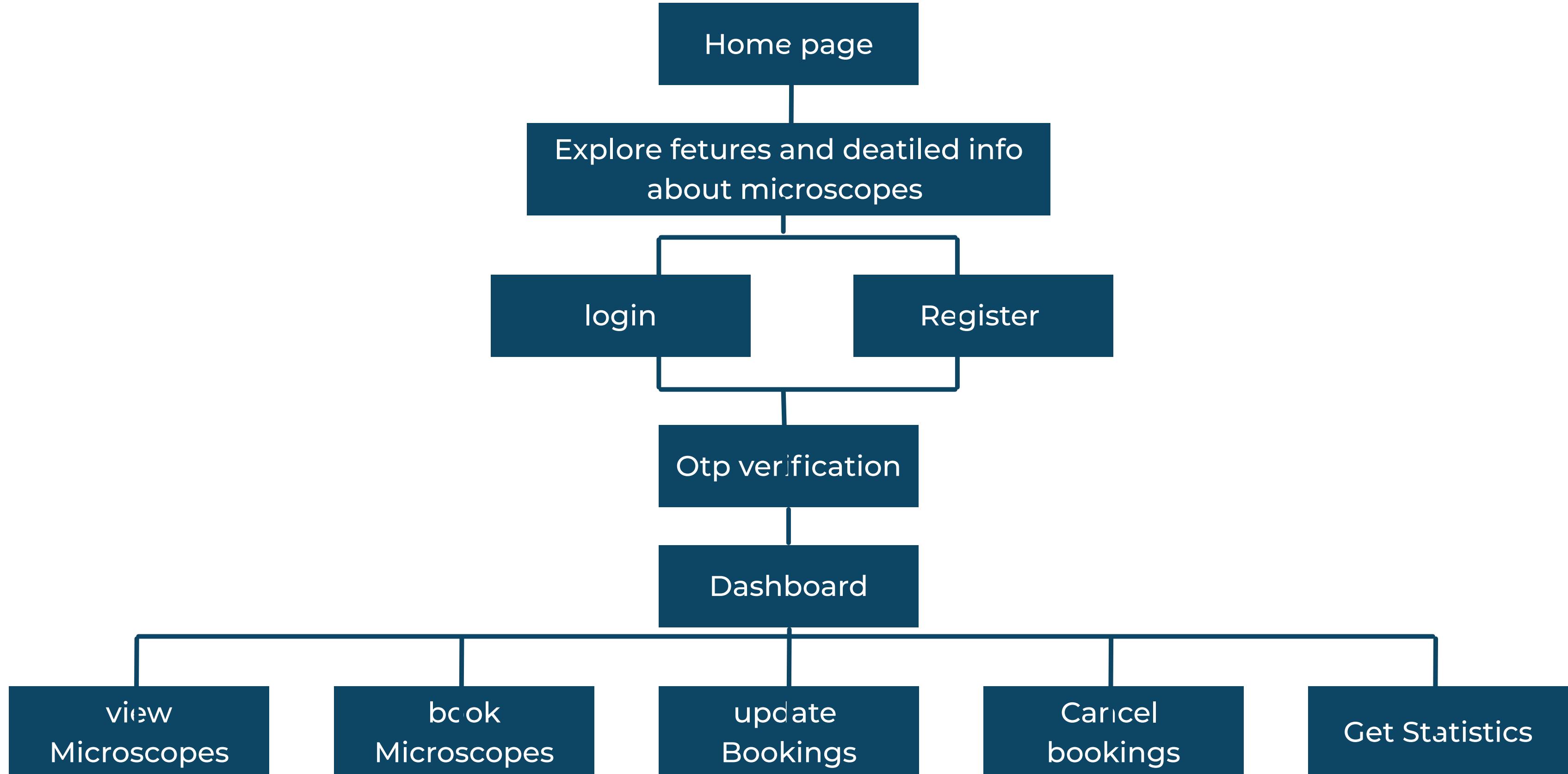
Instrument	Date	Start Time	End Time	Status
Confocal Microscope	2025-04-19	02:53	03:53	confirmed
Electron Microscope	2025-04-18	13:05	14:04	confirmed
Electron Microscope	2025-04-19	04:09	05:09	confirmed
Confocal Microscope	2025-04-18	03:10	04:10	cancelled
Electron Microscope	2025-04-19	05:13	06:13	cancelled
Confocal Microscope	2025-04-19	03:22	04:22	confirmed
Electron Microscope	2025-04-19	17:28	18:28	confirmed

**WebX Microscope**  
Advanced microscopy solutions for scientific research and discovery.

**Quick Links**  
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[Book a Microscope](#)  
[About Us](#)

**Contact Us**  
[123 Science Ave, Research Park](#)  
[+1 \(555\) 123-4567](#)

# FLOWCHART



# FUTURE SCOPE

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- Integrate SMS OTP support
- Analytics on microscope usage
- Slot-based advanced booking
- Notification dashboard for admins
- Mobile app version



# CONCLUSIONS

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The Microscope Booking System effectively streamlines the process of reserving lab equipment through a secure, real-time, and user-friendly web platform. By integrating OTP-based authentication, real-time slot validation, and a responsive dashboard, it eliminates traditional manual scheduling issues and enhances efficiency in academic and research environments. The system is scalable, customizable, and offers a solid foundation for future enhancements such as calendar integration, advanced analytics, and mobile accessibility. Overall, it's a practical solution that bridges the gap between technology and laboratory resource management.