# Business Plan for Research Image Management and Segmentation Platform

## 1. Executive Summary

The project aims to create a lightweight software platform that enables research groups to manage, segment, and organize their microscope images more efficiently. The target users are experimental researchers in materials science, particularly those working with 2D materials. The ultimate goal is to reduce inefficiency in the current manual image management and annotation workflows.

## 2. Problem Definition

- Researchers manually capture, store, and analyze microscope images, leading to inefficiencies.

- Risk of missing valuable samples due to inconsistent scanning and image capture.

- No centralized or standardized way to manage flake images and their annotations.

- Current workflows are fragmented: image capture, storage, segmentation, and organization are disconnected.

- Lack of lightweight, affordable tools for small-to-medium size labs.

## 3. Solution Overview

A web-based platform offering:

- User account management (registration/login)

- Image upload and automatic segmentation

- File-explorer-like UI for managing uploaded and processed images

- Manual annotation interface for users to correct segmentation/class labels

- Database backend storing original and processed images

- Exportable summary tables (flake ID, layer, size)

- Documentation to guide users on best practices for microscope imaging (avoid overexposure)

Optional Future Features:

- Local script to automatically read images from camera folder and upload

- Real-time frame capture and segmentation preview

- Group collaboration features

## 4. Customer Interview Records (Template)

Interview Record Format:

- Interviewee Name:

- Position:

- Lab/Institution:

- Date:

Core Questions:

1. What are your biggest challenges when managing microscope images?

2. How do you currently perform segmentation or layer identification?

3. How much time does it take to process a batch of images manually?

4. Would a centralized management and segmentation platform be helpful?

5. Would you be willing to pay for such a platform? If so, what range?

6. What other features would you like to see?

7. Are you interested in a local automation script for camera connection?

8. What concerns would you have about using such a system?

## 5. Market Landscape

- Existing Solutions:

- QPress (Brookhaven Lab) - full platform but limited to specific groups

- Zeiss arivis Cloud - enterprise-level, expensive

- Thermo Fisher Avizo2D - general-purpose, not customized for 2D material workflows

- Gaps Identified:

- No affordable, lightweight, web-based solution for academic materials science research groups

## 6. Go-to-Market Strategy

- Phase 1: Work with 2-3 labs for beta testing (e.g., OSU Bockrath and Lau groups)

- Phase 2: Collect structured feedback and refine MVP

- Phase 3: Open limited free trial to 10 labs

- Outreach methods:

- Direct lab-to-lab email outreach

- Academic LinkedIn groups

- Materials science conferences (virtual presentations)

- Pricing model (preliminary):

- Freemium model: basic free plan, paid for high volume or collaboration features

- Academic discounts

## 7. Milestone Plan

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| Stage | Goal | Timeframe |
| MVP Internal Test | Core upload, segmentation, DB ready | [Month-Year] |
| Beta Feedback Phase | 3 Labs actively using platform |  |
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