

The Problem: Teaching Staff Drowning in Administrative Chaos

It's Wednesday afternoon. Dr. X is staring at her screen, cycling through five different tools just to understand how her class is doing. **It will take her 90 minutes.**

90 min

EVERY WEEK, JUST TO CHECK CLASS HEALTH

Canvas Roster

GitHub Activity

Google Sheets

Slack Messages

Email Threads

She's looking for Sarah Martinez. Attendance is dropping. Commits are slowing. Journal entries stopped. But by the time Dr. X pieces these signals together from five disconnected systems, **it's week 8. Too late.**

The Scale Challenge

Managing at Scale

500+ students across 50 project teams. Limited TA hours.

Every student deserves to be seen, but the tools make it impossible.

- TAs spend 60% of time on admin, not mentoring
- Students slip through cracks until crisis point
- Fair grading impossible without data
- No early warning system

The Hidden Costs

Current systems fail everyone involved:

- Professors can't see individual students
- TAs grade based on incomplete information
- Team Leaders drown in coordination
- Quiet contributors become invisible

"Every student deserves to be seen, even in a class of 500. Technology should help with that, not make it harder."

— Dr. X, Software Engineering Professor

Statement of Purpose

Conductor Tool exists to transform teaching at scale by replacing administrative chaos with intelligent automation. Our purpose is to ensure that every student in a 500-person software engineering course can be seen, supported, and evaluated fairly—without requiring teaching staff to sacrifice their nights and weekends.

We believe that **good teaching shouldn't be impossible at scale**. Conductor Tool's purpose is simple: **automate administrative tasks so teaching staff can focus on what matters—teaching and mentoring.**

Our Appetite

5 weeks. Four core features. A system that transforms teaching at scale from impossible to manageable. This is a **small-batch, high-impact project** scoped to deliver a working MVP by December 5, 2024.

The Human Cost: Who This Affects

Four people. Four different pain points. One broken system.

Alex Chen

The TA (Group Mentor)

Pain: "I have 10 teams. Notes scattered everywhere. Can't track who's falling behind until it's too late."

Needs: Quick meeting prep. Fair grading data. Early warning signals. Structured note-taking that doesn't take forever.

Marcus Johnson

The Team Leader

Pain: "I spend more time coordinating than leading. 11pm and I still haven't written code. Can't document team dynamics anywhere."

Needs: Team dashboard. Availability tracking. Private channel to flag concerns. Time to actually lead, not chase people down.

Dr. X

The Professor

Pain: 90 minutes every Wednesday cycling through tools. Almost missed Sarah's crisis. Spent 10 hours manually forming teams.

Needs: Holistic student view. Early intervention. Sustainable tools that survive vendor changes. One place to see everything.

Aisha Patel

The Student

Pain: "40 commits. Most of the backend. But I'm quiet in meetings. Will anyone know I contributed? No safe place for feedback."

Needs: Recognition for actual work. Clear evaluation criteria. Private feedback channel. Transparent participation tracking.

The Pattern: Good People Failing Because of Bad Tools

By Week 8:

- Alex has graded based on incomplete information, feeling guilty about unfairness
- Dr. X has discovered three at-risk students, too late to help effectively
- Marcus is burned out, considering stepping down from team leadership
- Aisha's contributions are invisible, her grade doesn't reflect her work

The Solution: One Unified Platform

Replace the chaos with clarity. Automate the administrative burden so teaching staff can focus on what matters: teaching and mentoring.

90 min → 5 min

TIME TO UNDERSTAND CLASS HEALTH

Four Integrated Modules



Authentication & User Management

Secure UCSD-based login with role-based permissions. Instructors manage users, assign roles, and configure access for 500+ students.



Class Directory

Centralized hub for everyone in the course. Searchable roster, detailed profiles, group pages. The "phone book" for the entire class.



Attendance System

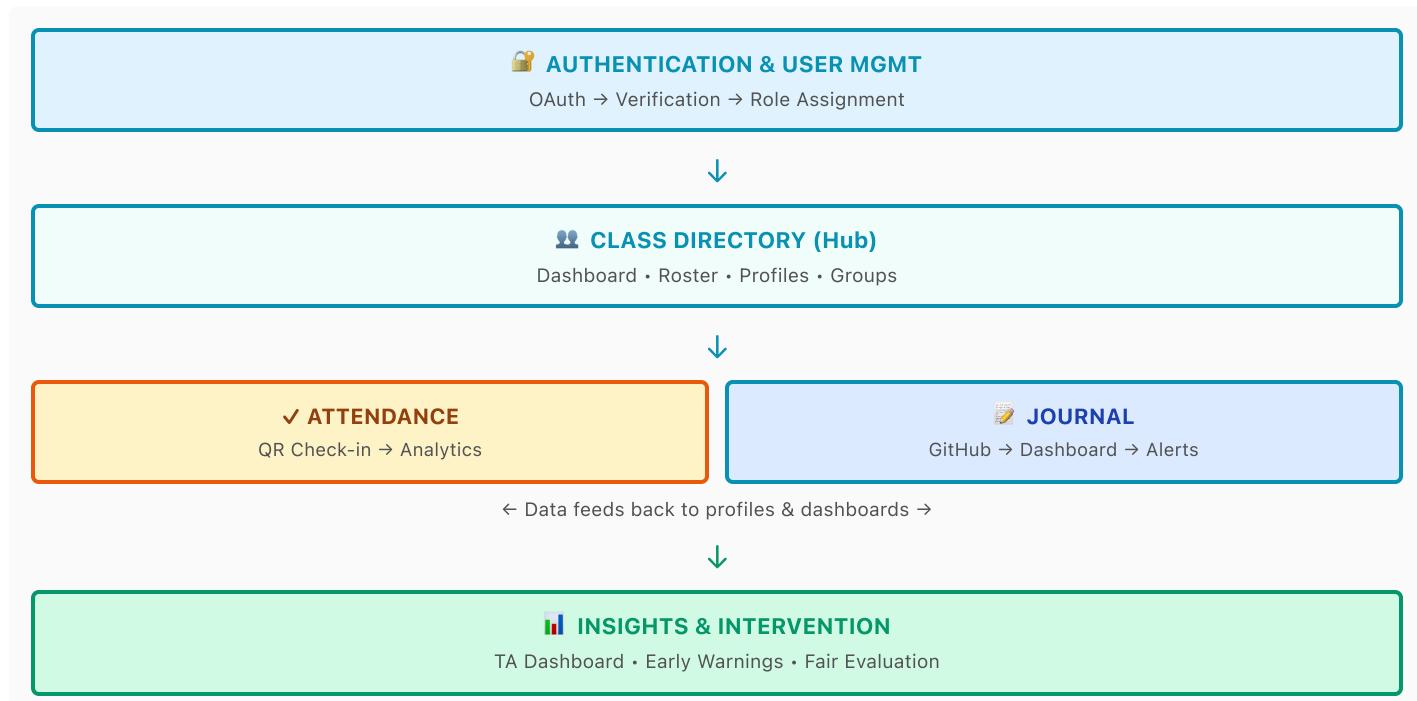
Quick-entry tracking for lectures, meetings, and office hours. QR code check-ins. Visual analytics. Takes <60 seconds for 200+ students.



Work Journal / Standup

Daily 2-minute check-ins with GitHub auto-population. Team dashboards for transparency. Automatic blocker escalation and early warnings.

How The System Flows



Core Principle

Automate administrative tasks. Amplify teaching impact.

By handling the busywork automatically, Conductor Tool gives teaching staff time to focus on mentoring students and helping teams succeed.

The Transformation

Before: Scattered Chaos

- 5+ tools to check class status
- Manual attendance spreadsheets
- Notes lost in text files
- Problems discovered week 8
- Grading based on gut feeling

After: Unified Clarity

- One platform, complete picture
- Attendance in <1 minute
- Structured, searchable notes
- Early warnings week 3
- Fair, data-driven evaluation

Design Approach

Our interface design prioritizes **speed, clarity, and accessibility** for users managing 500+ students. Each module follows a consistent design language with clear visual hierarchy and minimal clicks to complete common tasks.

Feature 1: Authentication & User Management

Secure, role-based access that handles 500+ students including UCSD extension students. Built for administrators to easily manage users and permissions.

Sign-In Flow

Sign-In Screen

Email: your@ucsd.edu

Password:

Sign in with Google (UCSD)

SIGN IN

Verification Screen

Find your code on Canvas or class Slack

Enter verification code

VERIFY

✓ Code verified - Student role assigned

User Management Interface

Manage Users - CSE 110 Fall 2024

FILTER BY ROLE **ADD USER** **ASSIGN GROUPS**

Sarah Martinez sarah.martinez@ucsd.edu	Student	Team Warriors	[EDIT]
Alex Chen alex.chen@ucsd.edu	TA	10 teams assigned	[EDIT]
Marcus Johnson marcus.j@ucsd.edu	Team Leader	Team Warriors	[EDIT]

Key Features

- UCSD Google OAuth integration
- Verification code system for roles
- Extension student workflow
- 6-tier role hierarchy
- Bulk user management

Security & Compliance

- Role-based access control (RBAC)
- FERPA-compliant data handling
- Audit logging for user actions
- Encryption at rest in database
- Admin-only password resets

Feature 2: Class Directory

The centralized "phone book" for the entire course. Searchable roster, detailed profiles, and group pages with all relevant information in one place.

Roster View

Class Roster - CSE 110 Fall 2024

Search by name... FILTER: ALL ROLES GROUP: ALL TEAMS

 Dr. X Professor	 Alex Chen TA	 Sarah Martinez Student, Warriors
 Marcus Johnson Leader, Warriors	 Aisha Patel Student, Dragons	 Jamie Wilson Student, Phoenix

Showing 6 of 523 users • Page 1 of 88

User Profile & Group Pages

User Profile

 **Aisha Patel**
she/her • ah-EE-sha
Student • Team Dragons

Contact:
aisha.p@ucsd.edu
Slack: @aisha

Availability:
Mon-Thu 2pm-6pm

Activity:
97% attendance
42 commits this week

Team Dragons

"Move fast and break things responsibly"

Members:

- Aisha Patel (you)
- Jordan Kim
- Taylor Brooks
- River Chen
- Sam Rodriguez

Resources:

- GitHub Repo
- Slack Channel
- Meeting Notes

Directory Features

- Searchable roster with advanced filtering
- Detailed user profiles with pronouns
- Group pages with team info and links
- Activity tracking integration

Benefits

- One place to find anyone in class
- Transparent team structures
- Easy coordination across 500+ students
- Replaces scattered contact lists

Feature 3: Attendance System

Quick-entry tracking for lectures, meetings, and office hours. QR code check-ins for students. Visual analytics and trends. Takes <60 seconds to record 200+ students.

Three View Modes

CALENDAR LIST TRENDS

OCTOBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14

CALENDAR LIST TRENDS

LECTURE
October 5, 3:30 ●

TEAM MEETING
October 4, 11:50 ●

MARIA'S OH
October 4, 1:30

LECTURE
October 2, 10:30

CALENDAR LIST TRENDS

— You
--- Class Avg

SEP 15 OCT 1 OCT 15

(Professor/instructor can see all students;
Students can only see theirs)

Recording Attendance

STUDENT VIEW

LECTURE, OCT 5



SCAN QR CODE

— OR —

Q2A5G

ENTER A-NUMERIC CODE

INSTRUCTOR VIEW

LECTURE, OCT 5

Show your students this QR code:



If they don't have a camera, ask them to enter this code:

Q2A5G

23 RESPONSES SO FAR

Meeting Details

LECTURE

DATE: OCT 5, 3:30PM

OWNER: PROFESSOR LEWIS

MEMBERS: 75 PARTICIPANTS [\[LIST\]](#)



Key Features

- Three view modes: Calendar, List, Trends
- QR code + alphanumeric code check-in
- Real-time response tracking
- Visual analytics and trend charts

Time Savings

- <60 seconds to record 200+ students
- Multiple view modes for different needs
- Automatic alerts for patterns
- Integration with student profiles

Feature 4: Work Journal / Standup

Daily 2-minute check-ins with GitHub auto-population. Team dashboards for transparency. Automatic blocker escalation. Early warning system for at-risk students.

Student Journal Entry

Daily Standup - November 8, 2024

GitHub Activity (Last 24h):
 ✓ 3 commits • 1 PR opened • 2 reviews
 Include in check-in

What did you accomplish yesterday?

- Implemented login auth (3 commits)
- Fixed bug #43
- Reviewed Sarah's PR

What will you work on today?

- Add JWT token refresh
- Write tests for auth module

Any blockers?
 △ Stuck on database connection pooling

How are you feeling? 😞 😐 😊 😕 😃

SUBMIT **SAVE DRAFT**

TA Multi-Team Dashboard

TA Dashboard - Prof. Anderson's SE 350
 Welcome back, Jennifer! Managing 5 teams (23 students)

PRIORITY ALERTS (2)

- ⚠ Team Warriors - Alex Chen
 BLOCKER: Database pooling • Sentiment: 😕 (down from 😊)
[\[View\]](#) [\[Message\]](#)
- ⚠ Team Phoenix - Jamie Wilson
 No check-ins for 3 days • Blockers unresolved
[\[View\]](#) [\[Excuse\]](#)

TEAM OVERVIEW

Team	Today	Blockers	Sentiment	Participation
Warriors	3/4 ⚠	1 🚧	😊 ↓	93% ✓
Phoenix	2/5 ⚠	0	😐 ↓↓	78% ⚠
Dragons	5/5 ✓	0	😊 →	100% ✓
Spartans	4/4 ✓	2 🚧	😐 →	96% ✓
Titans	5/5 ✓	0	😊 ↑	100% ✓

Team Dashboard

Team Warriors - Activity Dashboard
 △ 3/4 submitted • 1 blocker needs attention

Aisha Patel • 2h ago
 Working on: Database schema • **On track ✓**
 42 commits 5/5

Marcus (Leader) • 4h ago
 Working on: Frontend routing • **On track ✓**
 28 commits 5/5

Sarah Martinez • 3 days ago
 Last: API issues • **Alert sent to TA**
 2 commits 2/5

Team Health Analytics

Sentiment Trend (Last 7 Days)

 Team avg: 😕 3.2/5 (↓ 0.3 from last week)

Participation Metrics
This Week: 97% (29/30 check-ins)
Blockers:
 • 4 raised • 3 resolved
 • 1 active (Alex Chen)
 Avg resolution time: 2.4 hours

Alert & Notification Views

Team Notification (Slack)
Alex needs help!
 Blocker: Database pooling
 Posted: Just now
 I can help Escalate

TA Alert (Email/SMS)
Unresolved Blocker (4h)
 Student: Alex Chen (Warriors)
 Issue: Database pooling
 Sentiment: 😕 (down from 😊)
 View Details Send Message

Key Features

- 2-minute daily check-ins
- Github activity auto-population
- Team transparency dashboards
- Blocker escalation to TAs
- Early warning system

Impact

- Catch at-risk students by week 3
- Fair evaluation of contributions
- Team coordination simplified
- TAs get structured meeting prep
- Quiet contributors become visible

Technical Approach & Timeline

Technology Stack

React
Frontend

Node.js
Backend

PostgreSQL
Database

GitHub API
Integration

Sprint Timeline

1&2

Nov 1-13
Feature design & development

3

Nov 14
Midway check-in

4

Nov 24-28
Integration & Testing

✓

Dec 5
Technical Deadline

Scope Management

⚠ Rabbit Holes to Avoid

- Advanced analytics / ML
- Mobile apps
- Real-time notifications
- Custom grading rubrics

🚫 No-Gos

- LMS replacement
- Code review tools
- Video conferencing
- Assignment submission

Expected Impact

18x

Faster class health checks

60%

Less time on admin

5 wks

Earlier intervention

The Ask

We're seeking approval to build this 5-week MVP with:

- Development team of 10 engineers (already allocated)
- Access to UCSD infrastructure (Google OAuth, hosting)
- Pilot class for weeks 4-5 (50-100 students)
- Weekly check-ins with Dr. X for feedback

Why This Matters

Every quarter, **thousands of students** take project-based software engineering courses. Some thrive. Others slip through the cracks—not because they're incapable, but because **the tools fail them**. Conductor Tool changes that.

This isn't just about efficiency. It's about **equity at scale**. It's about making sure that in a class of 500, the quiet contributor in the back row gets the same attention as the vocal student in the front. It's about giving teaching staff the tools they need to **actually teach**, not just administrate.

Let's build a system where every student can be seen.

Even in a class of 500.