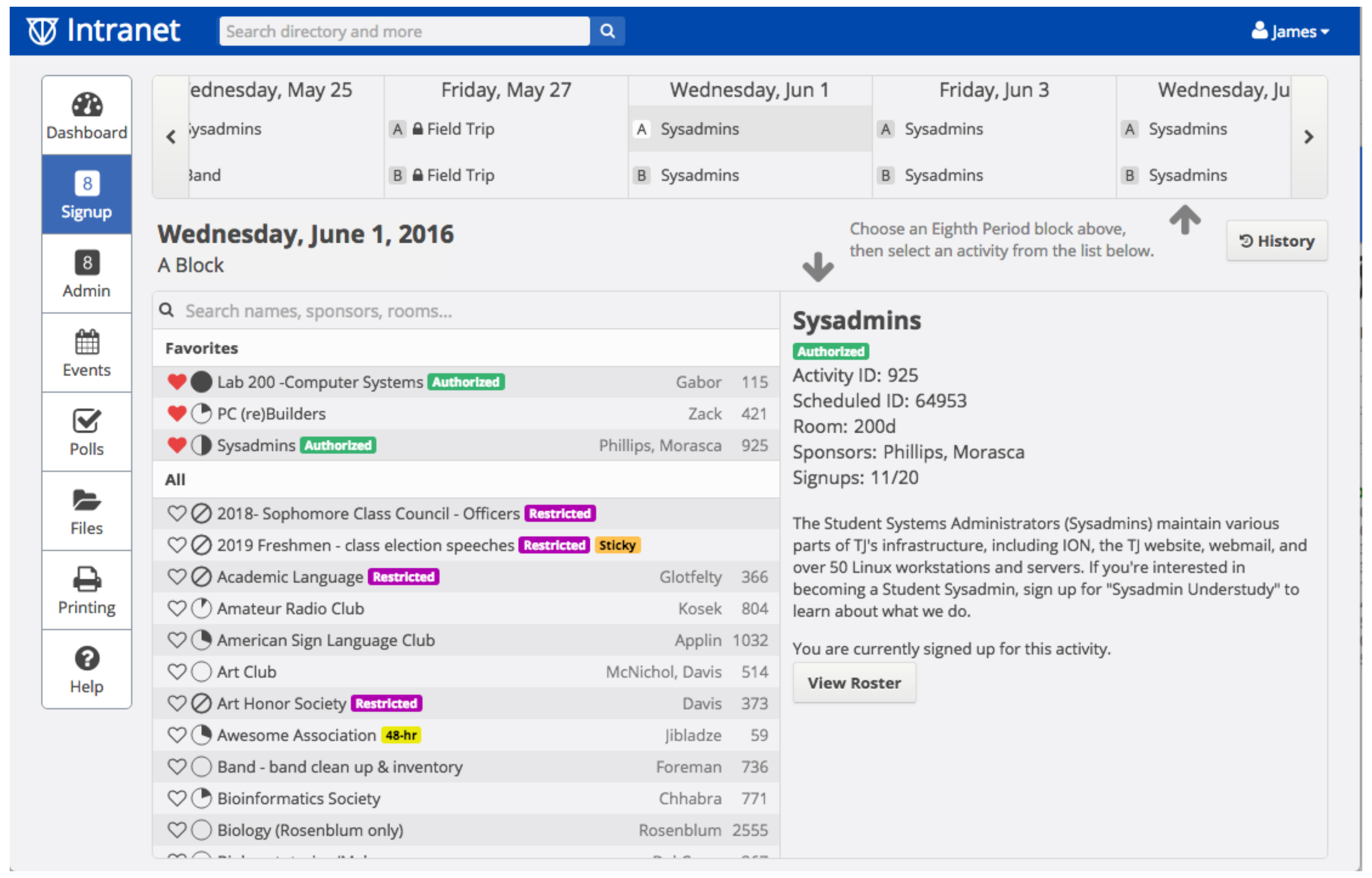
A Web-Based Intranet Platform for TJHSST

TJ Intranet 3: Ion

James Woglom
Computer Systems Research Lab
2015–2016, Period 3



Intranet | Search directory and more | James

Dashboard | 8 Signup | 8 Admin | Events | Polls | Files | Printing | Help

ednesday, May 25	Friday, May 27	Wednesday, Jun 1	Friday, Jun 3	Wednesday, Ju
ysadmins	A 🔒 Field Trip	A Sysadmins	A Sysadmins	A Sysadmins
and	B 🔒 Field Trip	B Sysadmins	B Sysadmins	B Sysadmins

Wednesday, June 1, 2016
A Block

Choose an Eighth Period block above, then select an activity from the list below.

History

Search names, sponsors, rooms...

Favorites

♥ ● Lab 200 -Computer Systems Authorized	Gabor	115
♥ PC (re)Builders	Zack	421
♥ Sysadmins Authorized	Phillips, Morasca	925

All

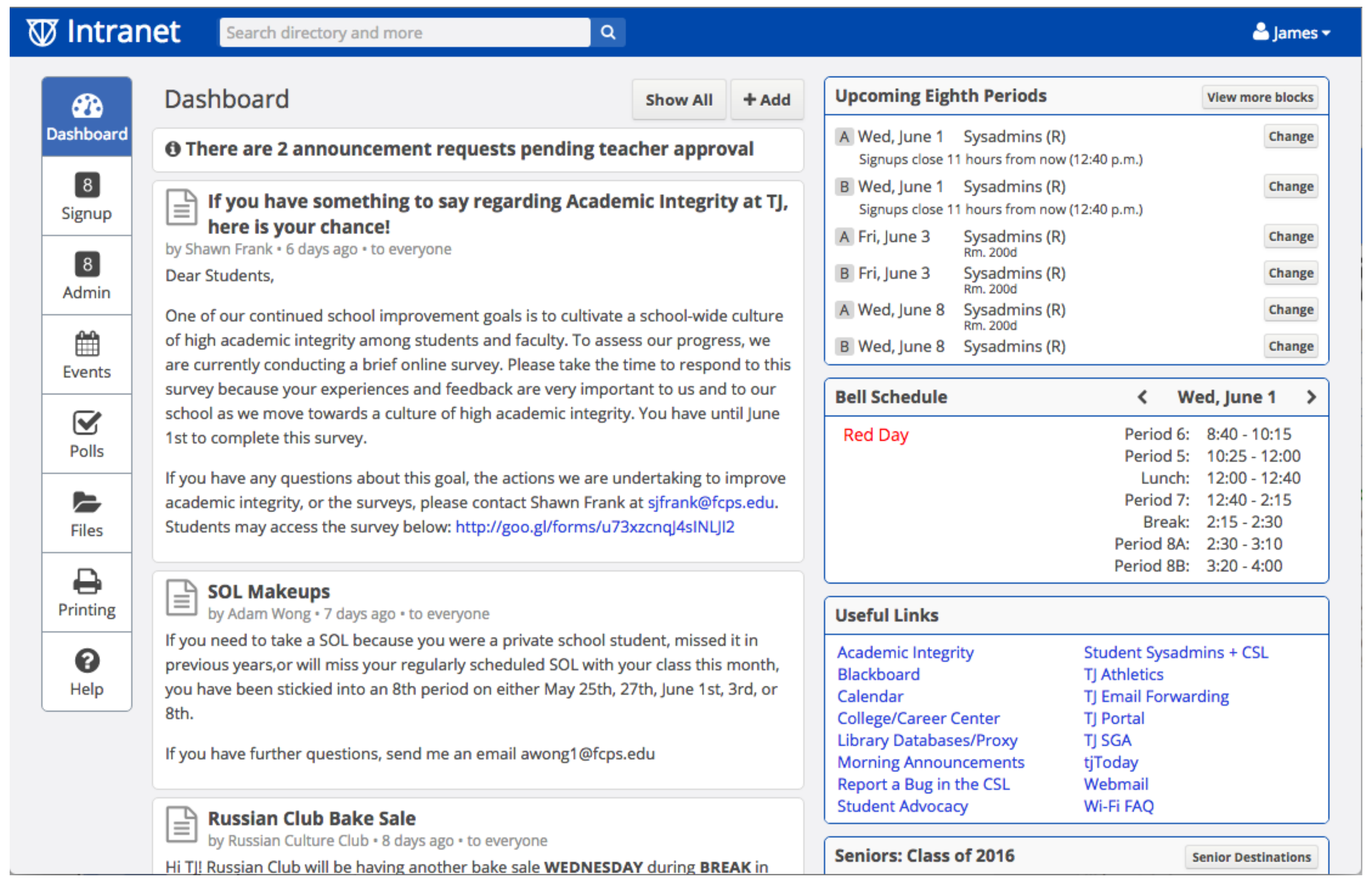
♡ ⊘ 2018- Sophomore Class Council - Officers Restricted		
♡ ⊘ 2019 Freshmen - class election speeches Restricted Sticky		
♡ ⊘ Academic Language Restricted	Glotfelty	366
♡ Amateur Radio Club	Kosek	804
♡ American Sign Language Club	Applin	1032
♡ Art Club	McNichol, Davis	514
♡ ⊘ Art Honor Society Restricted	Davis	373
♡ Awesome Association 48-hr	Jibladze	59
♡ Band - band clean up & inventory	Foreman	736
♡ Bioinformatics Society	Chhabra	771
♡ Biology (Rosenblum only)	Rosenblum	2555

Sysadmins
Authorized
Activity ID: 925
Scheduled ID: 64953
Room: 200d
Sponsors: Phillips, Morasca
Signups: 11/20

The Student Systems Administrators (Sysadmins) maintain various parts of TJ's infrastructure, including ION, the TJ website, webmail, and over 50 Linux workstations and servers. If you're interested in becoming a Student Sysadmin, sign up for "Sysadmin Understudy" to learn about what we do.

You are currently signed up for this activity.

View Roster



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Dashboard — Show All | + Add

There are 2 announcement requests pending teacher approval

If you have something to say regarding Academic Integrity at TJ, here is your chance!
by Shawn Frank • 6 days ago • to everyone

Dear Students,

One of our continued school improvement goals is to cultivate a school-wide culture of high academic integrity among students and faculty. To assess our progress, we are currently conducting a brief online survey. Please take the time to respond to this survey because your experiences and feedback are very important to us and to our school as we move towards a culture of high academic integrity. You have until June 1st to complete this survey.

If you have any questions about this goal, the actions we are undertaking to improve academic integrity, or the surveys, please contact Shawn Frank at sjfrank@fcps.edu. Students may access the survey below: http://goo.gl/forms/u73xzcnqJ4sINLJI2

SOL Makeups
by Adam Wong • 7 days ago • to everyone

If you need to take a SOL because you were a private school student, missed it in previous years,or will miss your regularly scheduled SOL with your class this month, you have been stickied into an 8th period on either May 25th, 27th, June 1st, 3rd, or 8th.

If you have further questions, send me an email awong1@fcps.edu

Russian Club Bake Sale
by Russian Culture Club • 8 days ago • to everyone

Hi TJ! Russian Club will be having another bake sale **WEDNESDAY** during **BREAK** in

Upcoming Eighth Periods — View more blocks

A	Wed, June 1	Sysadmins (R) Signups close 11 hours from now (12:40 p.m.)	Change
B	Wed, June 1	Sysadmins (R) Signups close 11 hours from now (12:40 p.m.)	Change
A	Fri, June 3	Sysadmins (R) Rm. 200d	Change
B	Fri, June 3	Sysadmins (R) Rm. 200d	Change
A	Wed, June 8	Sysadmins (R) Rm. 200d	Change
B	Wed, June 8	Sysadmins (R)	Change

Bell Schedule — Wed, June 1

Red Day

Period 6:	8:40 - 10:15
Period 5:	10:25 - 12:00
Lunch:	12:00 - 12:40
Period 7:	12:40 - 2:15
Break:	2:15 - 2:30
Period 8A:	2:30 - 3:10
Period 8B:	3:20 - 4:00

Useful Links

Academic Integrity	Student Sysadmins + CSL
Blackboard	TJ Athletics
Calendar	TJ Email Forwarding
College/Career Center	TJ Portal
Library Databases/Proxy	TJ SGA
Morning Announcements	tjToday
Report a Bug in the CSL	Webmail
Student Advocacy	Wi-Fi FAQ

Seniors: Class of 2016 — Senior Destinations

Background

Since the late 1990s, TJ has used various different systems to manage student signups, teacher attendance, and staff administration of the Eighth Period activity system. Although the modern TJ Intranet has many more functions, the Intranet system has always been focused around the Eighth Period component.

Beginning with the original *Intranet* application launched during the school year of 1999, this system was web-based and available to all students. Prior to the web-based student Intranet, TJ used a custom solution involving commercial computer database software combined with scripts to read signups from pencil-and-paper Scantron sheets, that were imported into commercial database software.

The original web-based Intranet software was written in PHP using the MySQL database, and suffered from many problems due to its poor architecture. It was designed in the late 90s and early 2000s using a new programming language, PHP 4, in an era where there were few standards for web programming. As a result, the application quickly became outdated and unmaintainable. In 2004, a project began to rewrite Intranet using modern PHP and object oriented programming known as *Intranet2*, codenamed *Iodine*. When it launched in 2006, it demonstrated the importance of passing down the Intranet application from year to year in order for it to remain in capable hands and be properly maintained. Over its lifetime, Iodine was expanded with numerous new features, and its object-oriented structure allowed for the Intranet application to actually be updated and enhanced upon as time went on. However, after continued use at TJ for nearly a decade, intermittent speed, efficiency, and code quality issues led to demand for a new system both developed with current technology and designed for modern devices.

Process

Intranet 3 (Ion) development began in mid-2013 by current Intranet2 maintainers Ethan Lowman (TJ 2015) and James Woglom (TJ 2016). The application was planned very early on to be Python-based because of the vast library support and stability that the language provides, and because Python is the preferred programming language for many Computer Science classes taught at TJ such as Artificial Intelligence and Accelerated CS.

The Django web framework is at the core of Intranet's architecture, and was chosen because of its emphasis on clean and pragmatic design and code structure. Django includes many built-in features, such as an administrative interface, object-relational mapper for database queries, user model and basic user authentication, and templating engine, which both work well together and allow for less custom code to be required. The separation of code into separate pluggable apps also allows for the application to be better structured and discourages code duplication. All apps use the model-view-controller framework, in which database models define how the database is structured using Python classes, views describe and run the code to be passed into HTML templates using a templating engine, and controllers such as the URL dispatcher deal with routing and serving files. The Django project is also well established, having been originally developed over a decade ago and now in use by many large companies, including Tumblr, Pinterest, and Bitbucket.

While a majority of backend infrastructure code was completed by the end of school year 2015, Ion launched in mid-November in order to allow for beta testing and feedback collection from students, teachers, and administrators. A three-day switchover occurred from Iodine beginning November 13th, and Ion launched publicly to all students on the 16th and successfully ran its first eighth period day on the 18th. Like previous versions of the TJ Intranet, Ion will be continually developed by students in order to keep the application as modern and adaptive to new technologies and methods as possible, and to continue its use as a learning tool and real-world example of custom software found in business and other enterprise environments.

Rationale

Planning for a full rewrite of Iodine began after a gap in Intranet developers for several years resulted in there being no current students who understood to a high degree how Iodine worked. The decaying quality and aging of the codebase, of which development had begun nearly 9 years earlier, also resulted in constant small problems spread throughout the application that seemed unfixable. The most noticeable issue for the student and teacher population was its poor speed and reliability as a modern web application. The backend PHP code, while object-oriented and using a class-based structure, required excessive server-side computation to occur on each page load, often going over 1,000 separate MySQL queries per page per user. The homebrewed nature in which the database was accessed meant that lots of individual database tasks that could be combined into a single and more optimized query were instead found individually, resulting in slower load times and race conditions.

The largest technological change that occurred during Iodine's lifespan, which it struggled to fully adapt to, was the emergence of smartphones and mobile devices. As more and more students began bringing smartphones to school, Iodine started to be used more and more frequently at all hours of the day, as opposed to just during lunch, breaks, and eighth period. This increased amount of load, coupled with the backend inefficiencies, resulted in Intranet often being completely inaccessible during peak times. Intranet2's front-end, which was designed for desktop browsers circa 2005, quickly became cluttered and archaic. Additional CSS themes were later added to bring Iodine's design up to par and offer some support for mobile layouts in 2012, but the application's core structure was still not optimized for mobile devices first. A very limited and homebrewed XML-based API also made creating third-party applications difficult.