

Jeffrey S. Raikes School of Computer Science and Management

2015 DESIGN STUDIO ANNUAL REPORT

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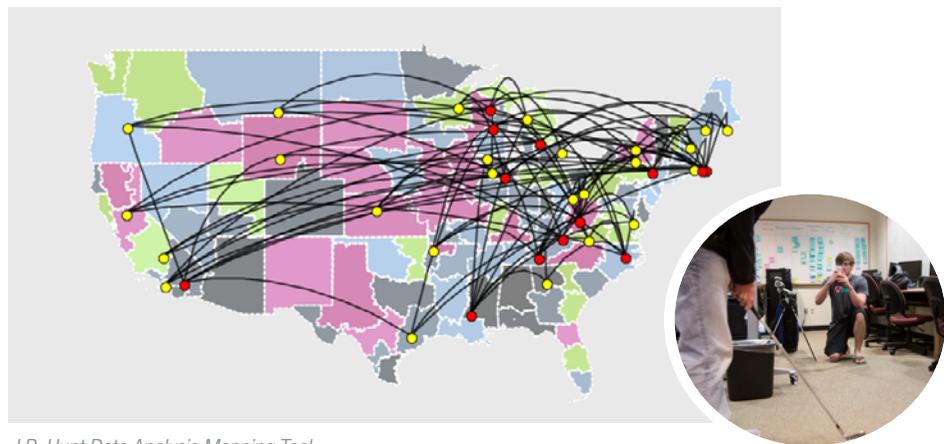
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J.B. Hunt Data Analysis Mapping Tool



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SIMPLIFYING THE COMPLEX

In Design Studio, complexity abounds. From wicked problems whose solutions require the interactions of many software components, to the preferences and goals driving individuals working together on a team. In Design Studio we are used to the complex; in fact, we thrive on it.

Looking at a complex world and seeing opportunity is what sets students in Design Studio apart. Through a curriculum that is built on training processes for innovation, students in Design Studio learn how to model systems and behavior, how to design elegant yet powerful solutions that are human-centered - they learn how to make sense of what might seem senseless. The workforce of this century needs people who can break disciplinary barriers and deliver in any environment, and those are exactly the kinds of people that Design Studio is producing!

Seven months ago, as campus was waking up to a new academic year, 100 students came together to develop software systems to address the needs of 17 sponsor organizations. Ranging from institutional research partners, to soon-to-be-acquired Silicon Valley startups, our partners had real problems demanding real solutions. This year, teams in Design Studio worked to:

- Improve construction management through the power of Windows Phone
- Create software to allow municipal departments to track assets in the field and better understand their deployment
- Reimagine how banks can better interact with their customers using next generation approaches to facial recognition
- Harness the power of the Internet of Things to better understand how people behave in medical spaces and provide insight to builders of hospitals and other medical facilities
- Develop tools for individual golfers to improve their game by analyzing swing performance
- Deploy next generation analytic tools to improve e-commerce platforms in the cloud
- Help a national transportation company better understand the performance of freight operations using GIS

- Create first-of-their-kind tools to improve the efficiency of scientists gathering data in the lab
- Improve internal medicine by giving physicians advanced 3D medical imagery tools
- Analyze millions of documents and extract handwritten data to improve the efficiency of document processing
- Develop solutions to connect patients and healthcare providers to improve the continuum of care
- Give high schools new tools for modular curriculum scheduling and student information management
- Bring the world of the human body to life for middle school science students with digital graphic novels and learning activities
- Assist first responders in the deployment of aerial firefighting assets using mobile devices
- Help researchers better understand and combat malware in mobile environments
- Implement revolutionary crop growth models to help producers manage corn and soy bean fields
- Model heating patterns in microwave ovens to allow designers to produce more efficient food containers

The teams have risen to the challenges posed to them and, in a few short weeks, will be handing over solutions to our partners' problems that will live on in new products, processes, and insights. At its core, that is what Design Studio is all about. Moving beyond the classroom to see the fruits of academic labor put into practice to make the world a better place. In Design Studio, we push the limits of academic and industry partnership to deliver big and this year has been no exception. Several teams were able to experience the challenges that come with developing products and pushing code to an active user base. The entire team continues to be blown away by what Design



Studio students are able to accomplish and the results they are able to produce.

Those results and the collective success of this program would not be possible without the generous support of our partners. Partners who sponsor projects, coach teams and give guest lectures, or help the Raikes School make our community a better place are what make Design Studio work. As we do each year, we are recognizing a milestone for one of our partners, Hudl. Since the beginning, Hudl has been deeply involved in Design Studio and this year is completing its 5th project. The entire Hudl team dominates at giving students an experience that will catapult them into their careers and we are deeply grateful for its - and all of our sponsors' - dedication to Design Studio.

As another year comes to a close, we continue to look forward to the possibilities for Design Studio, while also pausing for a moment to look back and reflect on the accomplishments of the past year and celebrate the success of students who will soon graduate and begin their next big adventure. While this report outlines many of those accomplishments, many more took place during midnight hackathons or were long ago erased from whiteboards covered in diagrams and code. It is in those impromptu meetings or casual observations where discovery happens and where we achieve our greatest success: simplifying the complex.

Ian Cottingham
Associate Director for Design Studio

PUSHING PROJECTS INTO PRODUCTION

Students in Design Studio are accustomed to getting their work in front of real users. This year, two projects took that concept to the next level: regularly releasing their software into full production and an active user base.

Together Clinic connects providers and patients in real time through a simple, easy-to-use online application. It captures self-reported patient data, such as symptoms, heart rate, blood pressure, medications, and more, and displays the data on a dashboard for the provider to review. An algorithm then process the data, alerting doctors to a change in a patient's health status that may warrant further attention, which helps them better manage chronic disease and decrease hospital readmissions.

The co-founders already had a working version of the application, but it lacked the structure needed to scale effectively.

The student team rebuilt the entire application and was able to put their first version of the software into production in January 2015.

“It’s been a great experience, building, deploying, and supporting software,” says David Dropinski, development manager for Together Clinic. “We have two sets of audiences using the system. We are actively incorporating feedback, fixing bugs, and coordinating new releases.”

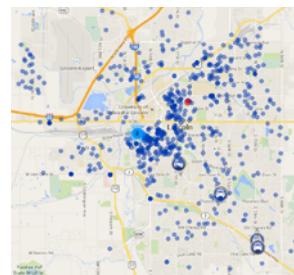
The experience demonstrated how user feedback can alter project features and settings.

“We hadn’t considered use-cases for users outside of Lincoln,” says product manager Kate Rilett. “As a result, one user had traveled to the Carribean and his input data was off by several hours. We worked quickly to update the application to accommodate different time zones.”

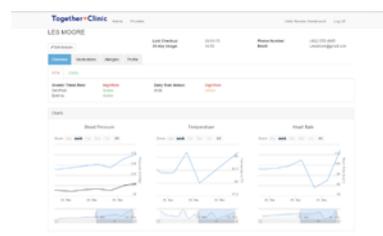
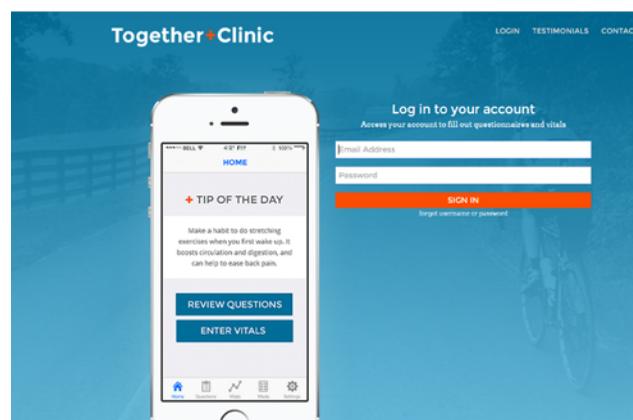
The project for the City of Lincoln also required students to build onto an existing web application and support its users in a live environment. Written for mobile devices, the software tracks vehicles and personnel via GPS coordinates, which are then displayed on a map within a web browser to give leaders a quick glimpse at the location of their resources.

Working on the existing framework, the City of Lincoln Design Studio team was able to deploy new code as early as the second release.

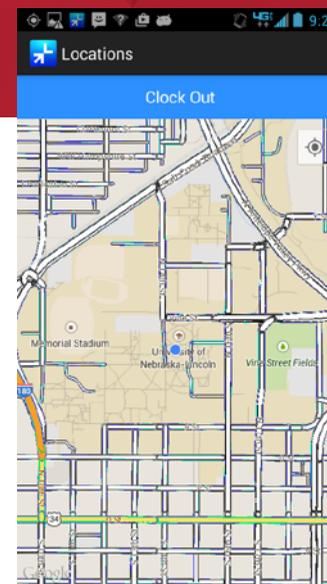
“Working on a live application gives us the ability to use real data to validate our work,” says product manager Kaleb Anderson. “Users are able to dig in, letting us know what we need to work on. Timely feedback helps us deliver better outcomes.”



The City of Lincoln system is currently being used by five city agencies and integrates with a variety of GIS resources.



Together+Clinic connects patients and providers in real-time.



IT'S ALL ABOUT THE DATA

Teams in Design Studio are becoming increasingly familiar with big data sets and data analysis thanks to a growing number of data-specific projects. Students are tasked with capturing information, analyzing data, and determining the right kind of visualization for the end user.

The five projects below represent a sampling of recent data challenges in Design Studio:

TOGETHER+CLINIC:

Data Challenge: Doctors want to stay connected to their patients, but don't have the time or resources to sift through the data to individually monitor patient conditions and better prevent hospital readmissions.

Solution: Using the application, patients input data about their symptoms and vitals. An algorithm processes the data and visualizes it, enabling medical staff to quickly identify patients who need follow-up care.

MUTUAL OF OMAHA:

Data Challenge: The company wanted to redact sensitive information from millions of scanned files.

Solution: Using computer vision and OCR technologies, the software identifies and obscures regions containing sensitive handwritten information. To accommodate such a large data set, the team explored various architectures to process the data quickly and accurately.

FISERV:

Data Challenge: A banking technology company wanted to utilize facial recognition technology to improve the customer experience. The student team needed an efficient, yet effective algorithm to process thousands of images and hundreds of data points to properly identify a human face.

Solution: Influenced by a lecture on diversity given at the spring advisory board meeting by University of Michigan Professor and Santa Fe Institute Fellow Scott Page, the team chose to use seven different algorithms to build a neural network that produces better and quicker results than any one particular algorithm.

MEDXT:

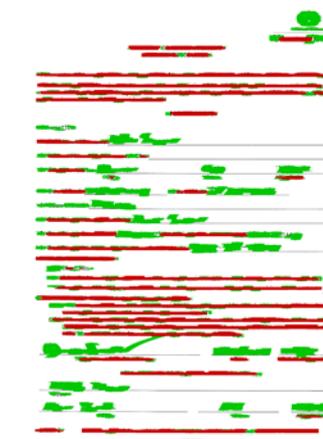
Data Challenge: MedXT wanted to explore how technology can be leveraged to incorporate large data sets from MRIs, CT scans, and other medical imagery to make doctors more efficient in their interpretation of patient health data.

Solution: The team built a conversion pipeline that takes sets of 2D images and builds them into 3D models. Rather than spending time sifting through xrays or scanned images, doctors can utilize one software application that allows them to examine all of the scans of a particular body part from a 3D perspective.

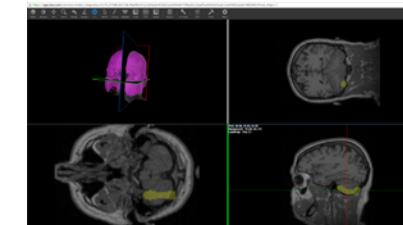
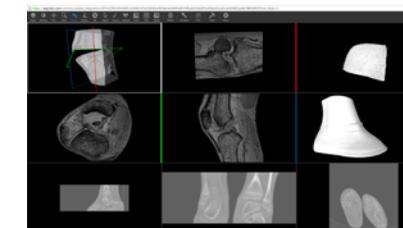
HUDL:

Data Challenge: Hudl wanted to give their users a “golf coach in their pocket,” by helping individuals analyze their golf swing to improve their game. At 240 frames/second, the team needed to find an efficient way to process and interpret the video data on a device with limited power (smartphone).

Solution: The team used computer vision to detect the characteristic motion of a golf swing. Custom algorithms were written to detect and analyze the information, and present it in a way that was beneficial to the user.



Detecting sensitive handwritten information for Mutual of Omaha



MedXT allows users to visualize and interact with an image in 3D

BETTER TOGETHER: DESIGN STUDIO AND ILAB

This year marked the start of a strategic partnership between Design Studio and Innovation Lab, the senior capstone course in the Department of Computer Science and Engineering. Recognizing the well-developed procedures and infrastructure of Design Studio, CSE looked to the Design Studio team to collaborate to find ways to enhance the student capstone experience beginning in 2014.

As a result, both programs are exploring ways to integrate iLab with Design Studio. This year saw Design Studio providing support for project management and instruction in iLab, driving a significant amount of value for CSE students, providing a deeper level of exposure to industry procedures and methodology, including agile engineering processes and lean business development.

Surveys were issued each month to iLab students to gauge the success of the

partnership. Results indicated that students were reaching their goals and achieving better outcomes, a natural by-product of a more streamlined process.

This year, working in collaboration with Design Studio, iLab ran both in the fall and the spring, tackling a total of six projects with three releases over the course of two semesters. One of the sponsors, i4 Opportunity Partners, worked on a joint project with both Design Studio and iLab student teams. Students learned to communicate about their respective solutions and worked together to hit release deadlines and integrate their outcomes.

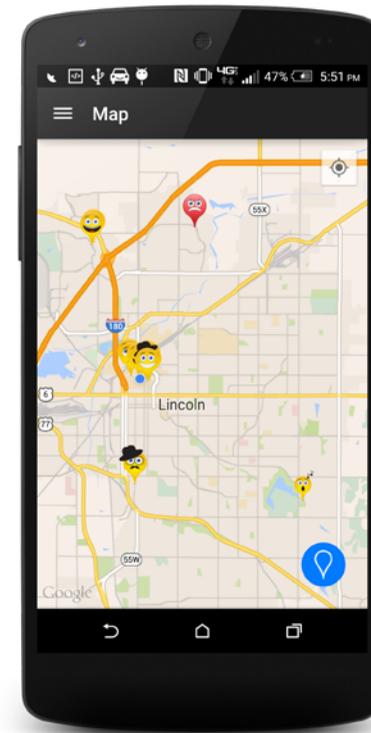
Design Studio and CSE shared the workload to leverage the strengths of both teams. The Design Studio team was responsible for identifying and securing iLab projects for CSE, and CSE faculty mentored students in addition to leading the applied computer science components of projects.

The future for both programs looks bright, with plans for full integration of iLab into Design Studio, including curriculum. CSE faculty and staff will teach in tandem with the Design Studio team. In addition, renovations taking place in the Kauffman building will create more space for teamwork, collaboration, and mentoring.

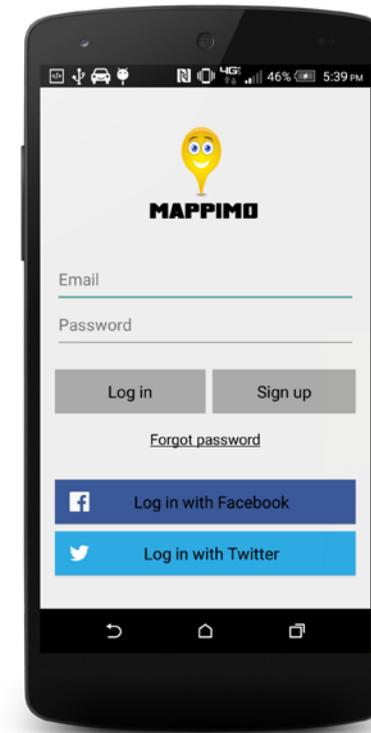
The Design Studio team and CSE agree that a more consistent process will better equip students with the skills and experiences necessary to compete in the world-wide talent pool.

“ THIS STRATEGIC PARTNERSHIP INCREASES THE VALUE FOR STUDENTS FROM THE RAIKES SCHOOL AND CSE. RAIKES SCHOOL STUDENTS BENEFIT FROM A CLOSER WORKING RELATIONSHIP WITH CSE FACULTY AND STAFF. STUDENTS FROM CSE ARE BEING EXPOSED TO THE PROCESSES, METHODOLOGIES, AND COLLABORATION THAT DRIVE RESULTS IN DESIGN STUDIO.”

- JEREMY SUING, DESIGN STUDIO PROJECT MANAGER



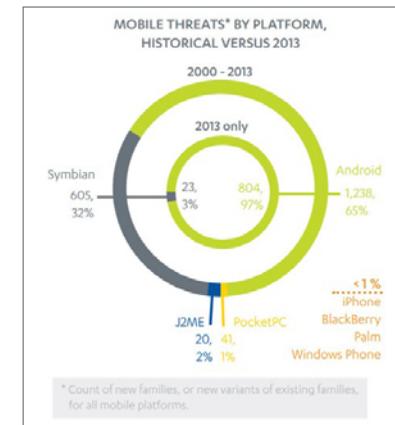
i4 Opportunity Partners Cloud Analytics Platform



Biology of Human



Nebraska Forest Service Yellow Book

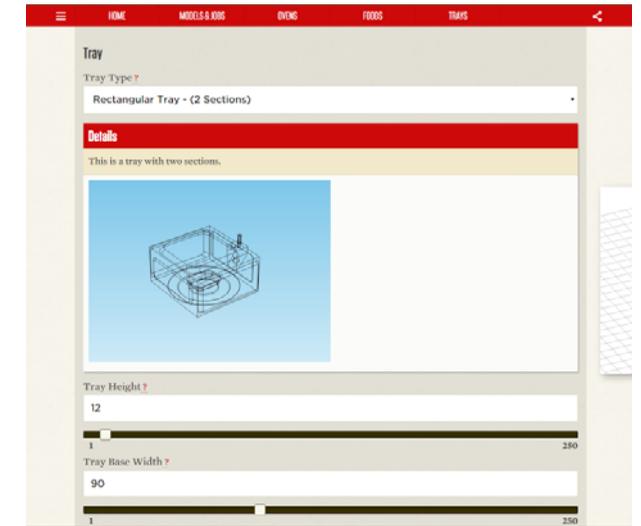


Android Malware Repository

```
private void save() {
    (AsyncTask) (params) -> {
        if (curEntry != null) {
            String string = text.getText().toString();
            File file = new File(string);
            if (string.length() == 0) {
                if (file.exists()) {
                    file.delete();
                    File parent = file.getParentFile();
                    if (parent.exists() && parent.list().length == 0) {
                        parent.delete();
                    }
                    File grandParent = parent.getParentFile();
                    if (grandParent.exists() && grandParent.list().length == 0) {
                        grandParent.delete();
                    }
                }
            }
        }
    }
}

private void saveLog() {
    File file = new File(getHome().getPath() + File.separator + logFile);
    Log.d("TAG", file.getAbsolutePath());

    try {
        FileWriter fileWriter = new FileWriter(file, true);
        fileWriter.write("user action");
        Log.d("TAG", "saveLog() " + file.getName());
        fileWriter.close();
    } catch (IOException e) {
        Log.d("TAG", "Exception occurred");
        e.printStackTrace();
    }
}
```



Virtual Food Design

fiserv. AN INNOVATIVE APPROACH TO BANKING

What if a bank could leverage emerging technology to transform the customer experience, beginning with the very first interaction?

As a global organization with more than 14,500 clients worldwide, Fiserv is highly regarded for its financial services technology and innovation, including award-winning solutions for mobile and online banking, payments, risk management, data analytics, and core account processing.

With an ultimate goal of enabling customers to move and manage money faster and with greater ease, Fiserv looked to Design Studio to explore how facial

recognition software could transform the future of banking.

To tackle this challenge, student development manager Ryan Erdmann and his team outlined the scope of work that included facial recognition, speech recognition, and remote assistance.

“They essentially wanted to find out what it would look like to re-imagine the experience for banking customers,” Erdmann explains. “Many of these technologies exist elsewhere, and we needed to figure out how to bring them into the banking environment.”

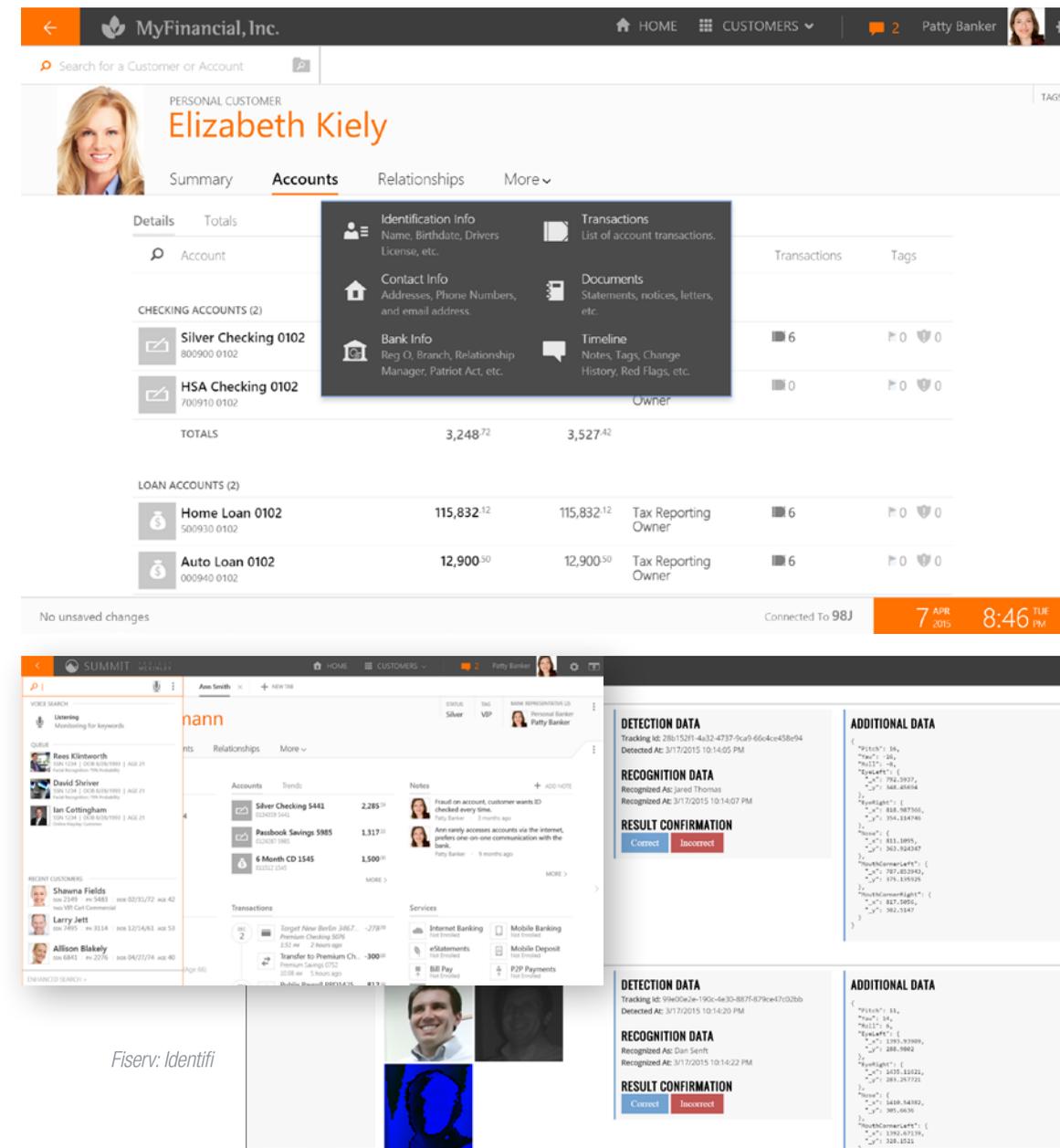
Once the team had sketched out the project details, they traveled to several bank locations to observe customer interactions and research the customer experience from the perspective of the teller, banker, and customer.

“Since many students simply rely on mobile and online banking, we weren’t as familiar with the bank environment. We could have falsely assumed that each bank was the same,” says student product manager Joe Lunde. “But we discovered that every bank has its own unique clientele and atmosphere. Our software needed to be able to accommodate these differences.”

Based on their research, the team discovered two significant benefits for the end user, including fraud prevention and a more personalized experience, helping bank staff recognize someone the moment they walk into the bank.

To capture the visual information needed to perform facial recognition, the team relied on a Microsoft Kinect v2 camera, as well as security cameras from the bank. But they needed to find the right set of algorithms to interpret the data.

“As humans, our brain naturally leads us to recognize another person. But we’re not 100% sure why that is.



Do we recognize the eyes, the structure of the nose, or a combination of features simultaneously? We are using sophisticated computer vision, but it’s still not as good as the human brain,” says Erdmann.

The team built a neural network trained with machine learning to combine the results of the algorithms. In doing this, they were able to achieve an accuracy rate of 80% in sample tests, a respectable rate given the current state of facial recognition technology.

Once an image is processed, it is linked to a robust notification system to let a teller or banker know that a customer has arrived. At this point, the speech recognition feature comes into play.

“The speech recognition feature functions like Siri,” says Lunde. “A teller could use it to instruct the system to pull up a particular account. When paired with facial recognition, it makes for a more efficient experience.”

For customers who choose to seek banking assistance from home, the solution includes a video chat option similar to the Amazon Mayday feature. Through an “assist me” or similar button on the bank’s website, a customer would have the opportunity to video chat with a teller or banker in real-time.

The team also had the opportunity to integrate their solution with a Fiserv team from New Zealand that was working on a project involving Bluetooth technology.

“We’re incorporating a variety of touch points to build a toolbox for tellers and bankers to use to deliver a better customer experience,” says Erdmann.

“WE’RE INCORPORATING A VARIETY OF TOUCH POINTS TO BUILD A TOOLBOX FOR TELLERS AND BANKERS TO USE TO DELIVER A BETTER CUSTOMER EXPERIENCE.”

– RYAN ERDMANN

2014-15 DESIGN STUDIO SPONSORS

DESIGN STUDIO | SWING COACH HUDL

Use video and image analysis techniques to develop an iOS application that individual golfers can use to automatically capture video for their swing and improve their performance on the course.

DESIGN STUDIO | LOCATIONS CITY OF LINCOLN

Implement a web-based platform for mobile asset tracking and analytics to provide a unified framework to allow municipal departments to easily manage, track, and deploy vehicle assets in the field.

DESIGN STUDIO | REINVENTED CONTINUUM OF CARE TOGETHER+CLINIC

Enhance a web-based solution that connects patients and physicians by giving patients a place to enter daily vital statistics supporting a physician dashboard for analytics and patient monitoring. Develop machine-learning algorithms to enhance the predictive value of the system supporting the lowering of readmission rates.

DESIGN STUDIO | 3D TOOLS FOR MEDICAL IMAGERY MEDXT

Develop 3D visualization tools and next-generation manipulation techniques for a new medical imaging platform. Evaluate various rendering packages, build a data processing pipeline, and integrate the technology with an existing viewing platform.

DESIGN STUDIO | IDENTIFI FISERV

Research, design, and prototype capabilities for banks to use motion sensing input devices - specifically Microsoft Kinect for Windows v2 - to optimize branch processes and improve the overall customer experience. Implement a proof of concept application to demonstrate accuracy of analysis algorithms.

DESIGN STUDIO | DATA ANALYSIS MAPPING TOOL J.B. HUNT

Develop a web-based mapping solution to display operational metrics that can be used by individuals within the J.B. Hunt business to better understand the performance of freight operations in the U.S.

DESIGN STUDIO | BULDERTREND FOR WINDOWS PHONE BUILDERTREND

Develop a Windows store application (tablet and phone) to complement existing tools for iOS and Android that supports construction project management by providing users with photo upload, log creation, document management, scheduling, and communication with stakeholders.

DESIGN STUDIO | LABFRAME™ SOFTWARE LI-COR

Develop a first generation digital solution using web technologies that will provide professionals with a tool that can easily import, manipulate, and organize multiple digital sources into a cohesive report.

DS & ILAB | CLOUD ANALYTICS PLATFORM 14 OPPORTUNITY PARTNERS

Build a base white-label mobile analytics platform to integrate with a cloud-based ad network ecosystem and incorporate an application independent analytics engine to provide greater insight into the profitability of placed ads.

DESIGN STUDIO | HEURISTIC MODEL FOR DATA CLEANING MUTUAL OF OMAHA

Create a technology solution that utilizes a heuristic model to inspect files, identifying classes of information that exist within the digital content, redacting and analyzing the associated data, and providing reports based on the identification and remediation of the classes of information.

DESIGN STUDIO | WARRIORBOARD: DIGITAL SCHEDULE CREATION AND MANAGEMENT WESTSIDE COMMUNITY SCHOOLS

Develop a web-based application to assist counselors and administrators at Omaha Westside High School in developing modular schedules for courses, rooms, students, and teachers. Develop project stretch goals for a broader student information system that gives students access to schedule changes, a learner profile, and other resources.

DESIGN STUDIO | ANALYZING BEHAVIOR IN MEDICAL SPACES USING SENSOR NETWORKS

Develop a deployment model for sensors to capture data in physical spaces that might be used to better understand the behavior of individuals in the space and create web tools to visualize information generated from collected data.



HDR team installing sensors in a mock exam room

ILAB | BIOLOGY OF HUMAN NIH SEPA / UNIVERSITY OF NEBRASKA

Work with a team of curriculum developers to create a digital graphical novel and related activities for iPad to teach middle school students about the human body.

ILAB | ANDROID MALWARE REPOSITORY UNL COMPUTER SCIENCE AND ENGINEERING

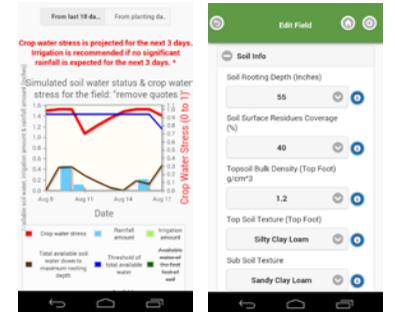
Develop a repository of techniques and tools to detect malware applications running on Android devices and evaluate the efficacy of detection models and implement improvements.

DESIGN STUDIO (FACULTY WITH ILAB) | VIRTUAL FOOD DESIGN UNL FOOD SCIENCE & TECHNOLOGY

Develop an easy to use simulation environment that enables food processing companies to design microwaveable food systems using a systematic and rational approach to shorten product development cycles, reduce cost, and deliver a high quality and safe product to consumers.

ILAB | AGSIM WEBIFY UNL AGRONOMY AND HORTICULTURE

Develop mobile-friendly applications for iPhone and Android devices to allow producers to interact with advanced models for crop growth simulation.



ILAB | NFS YELLOW BOOK NEBRASKA FOREST SERVICE

Develop a mobile phone application to provide NFS with up-to-date location information of contracted aviation resources to assist with wildfire suppression.

PREPARING STUDENTS FOR A MOBILE WORKFORCE

Over the last several years, companies have experienced a shift toward a mobile work environment; and Design Studio students are no exception.

With the need to access information, validate development, and collaborate, the Design Studio team has adopted a mobile environment for project management, development, and production.

“Because many student teams perform work at their clients’ offices and validate solutions with end users at different locations, we’ve equipped the product managers with a Microsoft Surface tablet that functions as both a productivity tool and a development device,” says Zach Christensen, Design Studio Development Manager.

“This device, coupled with cloud technology, enables students to have access to real-time information wherever

they go, at a level that’s more powerful than an iPad or Android tablet.”

Posed with the challenge of developing an application that could serve as a “golf coach in your pocket,” the student team developing the Hudl Swing Coach has seen firsthand the benefits of this approach.

“When you’re developing software, you have to be able to put yourself in the user’s shoes, in their environment, which for us happened to be a golf course,” says Derek Nordgren, development manager for Hudl Swing Coach. “We were able to take everything with us, and have access to all of our information through the Microsoft Surface tablet and a few other devices. This made it possible for us to test, validate, and even fix issues in the field.”

It has also provided David Dropinski, development manager for Together Clinic, and his team with the opportunity to travel to the hospital and other locations to meet with the physicians who co-founded the application.

“If we uncovered an issue during the meeting, we were able to dive right into the code and explore the items that we needed to address,” he says.

Design Studio plans to continue this shift toward a mobile environment, increasing the number of Surface tablets available for students. There are also opportunities on this platform to build custom apps for the Design Studio team to better manage workflows and program processes.



Hudl Swing Coach Application analyzes the motion of a golf swing



EFFICIENCY AND COLLABORATION IN THE CLOUD

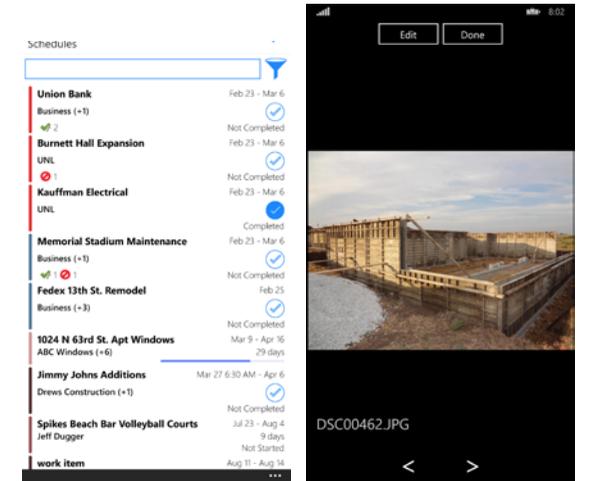
Business today is done in the cloud, which is now a critical piece of the Design Studio infrastructure.

“By moving to a cloud environment, we’re exposing the students to the technology they’ll use in major corporations and startup scenarios,” says Ian Cottingham, Associate Director for Design Studio. “Plus, it’s more cost effective than the alternative, allowing us to divert resources directly to student engagement and hardware like the Surface tablets.”

Together Clinic and the City of Lincoln were two Design Studio projects this year that had existing users, resulting in the support of a live environment. By leveraging the cloud, these teams have been able to utilize real-time staging environments to tweak and adjust their software before pushing out new releases.

The move to the cloud has also increased staff and student efficiency. Rather than passing files and information back and forth, or having to move information from one machine to another, students access everything they need through cloud-available services ranging from file sharing to real-time collaboration.

“Rather than spending faculty and staff time on IT support, the cloud enables us give these tools to the students,” says Jeremy Suing, Design Studio Project



BuilderTREND Mobile Application

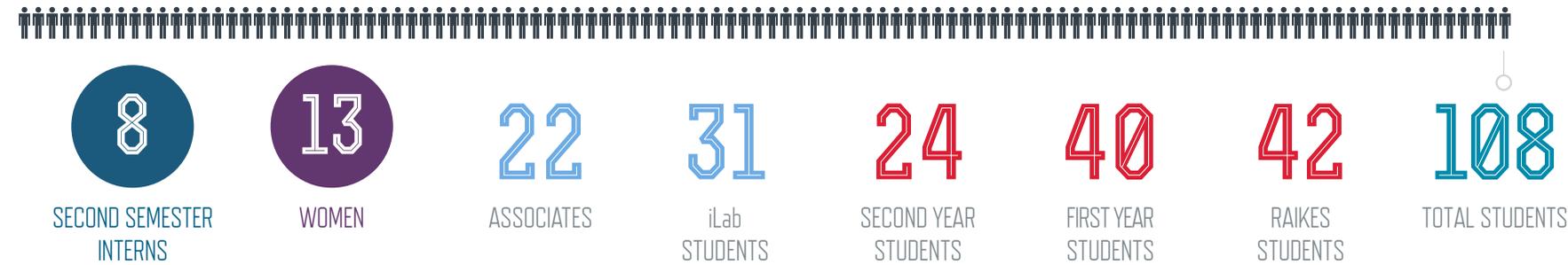
Manager. “Windows Azure and GitHub have helped us create a true-to-life experience where students gain valuable, real-world knowledge.”

Design Studio teams also utilize GitHub, which helps to manage and store revisions of projects, allowing students to have a code repository where they can track issues, utilize wikis, and more. This helps them better understand the intricate details involved with building and supporting a software program.

Once a student graduates from Design Studio, he or she will understand the tools, methods, and processes needed to build, deploy, and support a software product in the cloud.

THE NUMBERS BEHIND DESIGN STUDIO

DEMOGRAPHICS



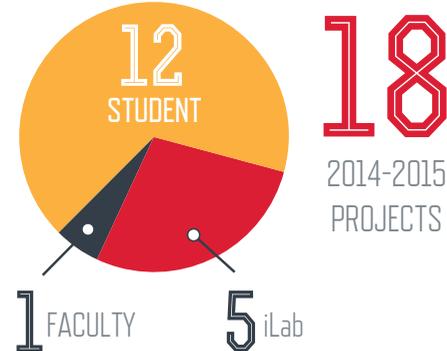
TECHNOLOGIES



SCOPE



PROJECTS



BRINGING THE STARTUP ENVIRONMENT TO KAUFFMAN

The interior of Kauffman will undergo exciting changes in 2015.

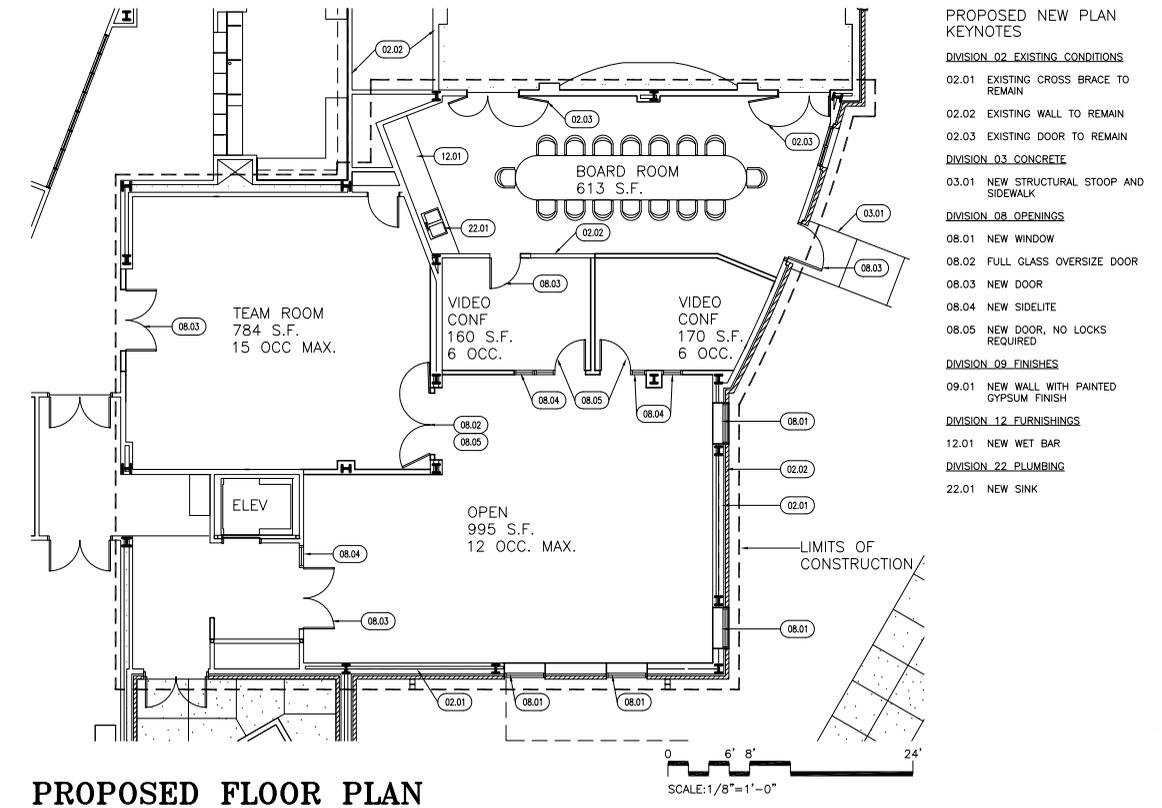
“Our vision is to create a progressive environment that is intentionally designed for collaboration, with flexibility for a number of student work scenarios,” says Ian Cottingham, Associate Director for Design Studio.

With an increasing number of students involved in Design Studio, Cottingham says the team rooms are at capacity and need more space to grow. As a result, the Raikes School will be renovating the commercial kitchen located on the first floor of Kauffman.

“We don’t currently utilize the kitchen as it was originally intended,” says Cottingham. “So, rather than having it sit empty, we decided to repurpose the space.”

The plans feature a design-thinking inspired layout, utilizing modern furniture and light fixtures. With an eye on flexibility, the Design Studio team wants to create a space that feels less like a classroom and more like a Silicon Valley startup. Longer tables, bigger screens, multiple docking stations, and walls of white boards will make it possible for teams to share ideas and develop solutions.

“This space will mirror the type of teamwork, development, and production that exists in a real-world environment,” says Jeremy Suing, Design Studio Project Manager. “Students can come together to address issues, brainstorm ideas, or simply meet with a sponsor.”



The renovated space will also include video conferencing rooms, empowering students to effectively communicate and manage projects regardless of geographic location.

With this resource available, capstone students from the Department of Computer Science and Engineering will be able to work on their projects in Kauffman, where they will be in close proximity to Design Studio faculty and staff.

Construction is scheduled to begin July 1, and will be completed by November 2015.

LINKING ACADEMIA TO INDUSTRY

As a coach for Design Studio, Paul Bauer is a fellow Raikes School graduate himself. It's not uncommon for graduates to give back, and many do through the role of a coach to a student team.

“When I went through the Design Studio process many years ago, we did not have the coaching program as well defined,” says Bauer. “I’m excited to come back and help teams through specific problems, providing encouragement and connections along the way.”

The role of a coach has been an important part of the learning process for thousands of years. But it's been one that's often missing in the world of academia.

“A lot of industries are beginning to adopt this idea of apprenticeship learning, utilizing a master to show and guide an apprentice along the way. All of the great artists were an apprentice to another artist at some point,” says Jeremy Suing, Design Studio Project Manager. “By bringing in coaches who are also leaders and experts within the industry, we're able to better connect students with ideas and methodologies from the real-world.”

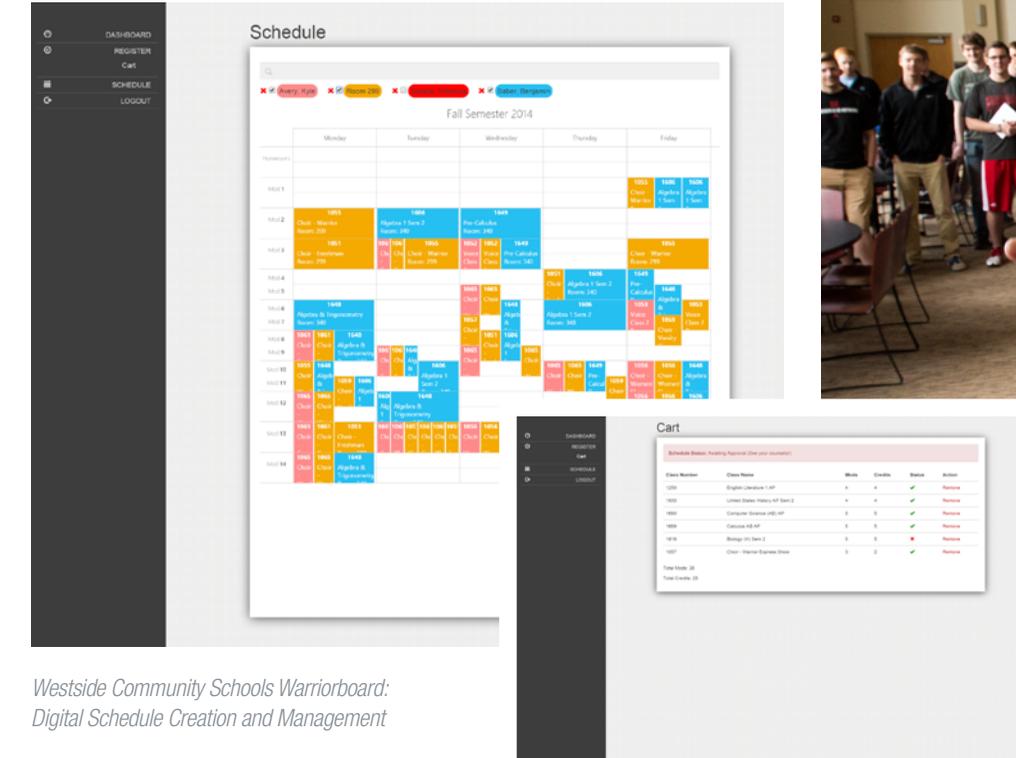
In the last few years, Design Studio has formalized the role of the coach, assigning one to each student team for the course of the Design Studio year.

Coaches complete a short orientation with students in August. From there, the meeting schedule varies based on needs. Many times, the coach will have technical expertise as a software developer so he or she can lend their expertise regarding software architecture, design, and deployment. Other times, coaches have been involved as project managers in larger corporations or startups, and their expertise helps students with communicating project details, delivering results, and managing expectations.



As a coach for the Omaha Westside Schools project, Bauer has been a sounding board for the students. Working on a web-based application for modular scheduling, students looked to Bauer to help them clarify exactly what the sponsor was looking for, project requirements and scope of work.

“When you're a college student, you may get an assignment on the first day of class,



*Westside Community Schools Warriorboard:
Digital Schedule Creation and Management*

and then work all semester to turn in the assignment just as it appeared on the syllabus,” Bauer explains. “But that's not how the real world works. Projects change, clients change their mind, and systems change. We're there to help students navigate this process in Design Studio. Plus, the small pivots made throughout the course of the semester often result in a much better outcome.”

In years past, students may have been nervous to talk to faculty and staff about project challenges, for fear of it affecting their grade. Industry coaches serve as a neutral third-party that students can utilize to share ideas, solve problems, and gather feedback that is critical to their learning and development.

Software developer Nick Ebert also graduated from the Raikes School and now serves



as a coach for Design Studio. This year his efforts went toward supporting the Fiserv project. He notes how important it was for the students to learn that they can “throw things away” throughout the course of the project.

“Refactoring is an important part of good software development,” he says. “Having the students hear this from a coach is encouraging since I face this on a regular basis in my job. Students realize how to pivot and learn from their efforts, often starting over to build something better.”

Coaches benefit from the relationship as well. In addition to enhancing the learning process, many have said they enjoy the energy and excitement that comes from working with such a skilled and ambitious group of students.

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DESIGN STUDIO CURRICULUM: BRINGING THE CLASSROOM TO LIFE

At the Raikes School, an industry-focused curriculum is imperative for student success.

By integrating agile engineering processes, lean business development, and interdisciplinary design thinking, students gain experience with a variety of concepts and technologies used in Silicon Valley and other tech-driven environments.

“When companies hire software developers, they need them to hit the ground running,” explains Doug Durham, software engineer and adjunct professor at the Raikes School. “The Raikes School has made it a priority for students to gain practical knowledge that familiarizes them with the way the world works when they graduate.”

As the Director of Research for Design Studio, Ashu



Guru helps students learn how to identify the right tools and strategies needed to develop solutions regardless of domain.

In his classes, Guru covers topics such as relational database models and methodologies to handle large amounts of data, such as map-reduce, distributed file systems, No-SQL databases, and graph databases. Students are provided with opportunities to make contextual decisions, a skill that will prove invaluable in their careers.

Students are also given the opportunity to learn from industry contributors like Tom Seevers, an IBM Fellow and visiting professor at the Raikes School. Seevers has helped students better understand software architecture and how to test the viability of their design.

“When we were studying software development and design methods, my team was trying to figure out how to structure our application so it could scale for thousands of users” says David Dropinski, development manager for Together Clinic. “It was great to see this curriculum in action.”

Additional learning opportunities are offered in conference-style schedules, allowing students to pursue knowledge in areas that pertain to their specific projects and/or interests.



CURRICULUM AT A GLANCE

DESIGN STUDIO I
DEVELOPMENT OPERATIONS

DESIGN STUDIO II
SOFTWARE ARCHITECTURE AND DESIGN

DESIGN STUDIO III
LEADING PRODUCT DEVELOPMENT TEAMS

DESIGN STUDIO IV
DATA-DRIVEN DEVELOPMENT METHODS

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