July 16, 2020
#A11yVR
meetup.com/a11yvr

From Hack to Product Feature

How to leverage R&D at work through hackathons

Roland Dubois @rolanddubois

Hello, I’m Roland Dubois

- Product Designer, Leader, Manager
- Recently, Product UX Lead at a SaaS Startup
- XR Accessibility at Virtuleap
- Mozilla Tech Speaker
- Member of W3C Immersive Web CG &
  XR Access Initiative
- Host of WebXR (A-Frame NYC) workshops & events
- Creating immersive experiments that make the
  current VR/AR industry accessible for everyone.

Agenda

Design & Maturity
Facility Management
The Ideas That Don’t Fit
Find Your Hackathon
Hack & Open-Source
Build Your Case At Work

Design & Maturity

Design in Startups

- Startups are scrappy & messy *"... growing pains"*
- No time or energy to experiment beyond the product roadmap
- Focus on product market fit
- Sales team is the main driver
- Design keeps up with the agile dev team
- Accessibility is deprioritized *"... receiving ADA compliance letters are a cost of doing business ..."*

What is Design/UX Maturity?

It’s a scale that measures the business relationship with design.

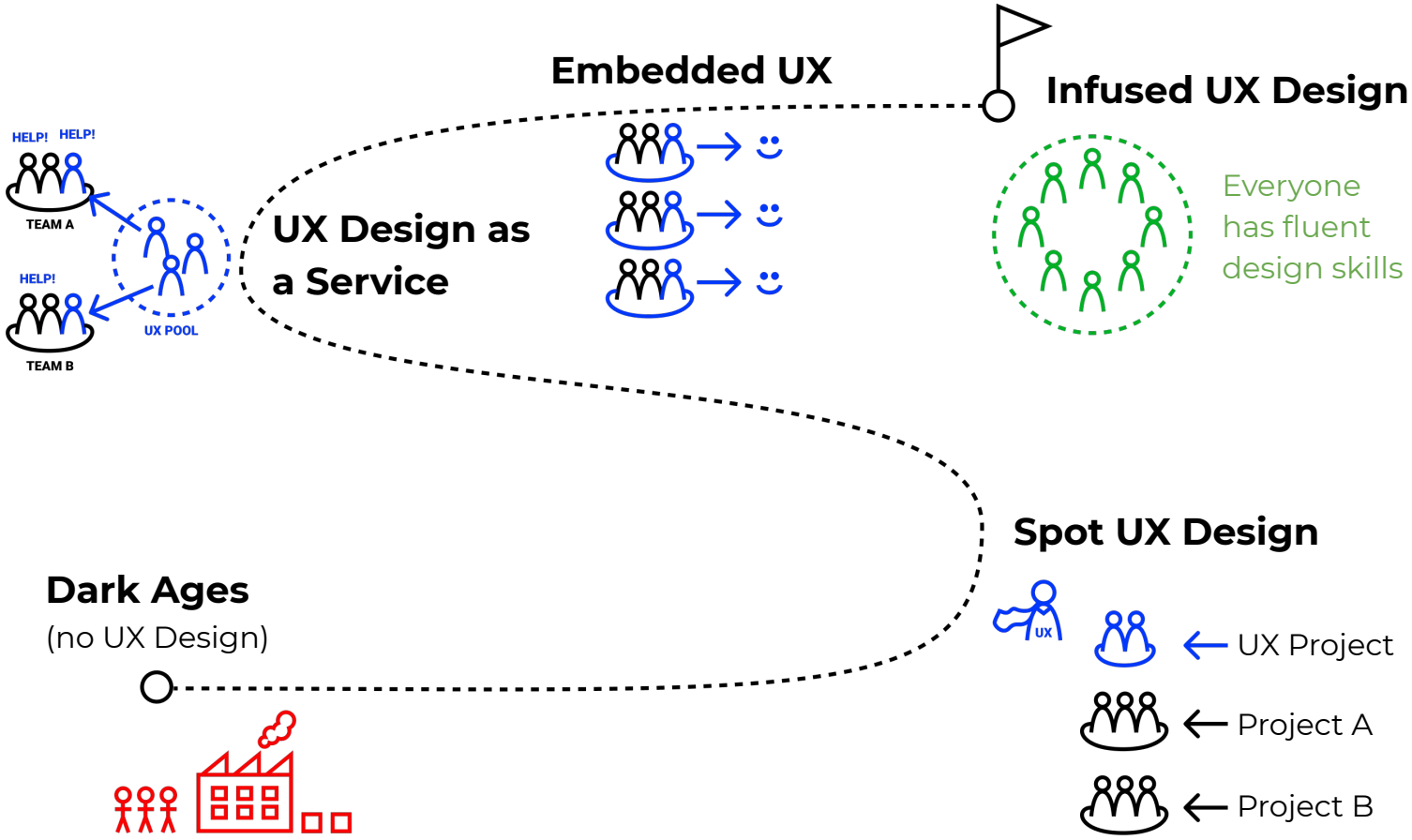
Increasing the maturity of design in a company is not something that can be done overnight.

It can take years.

But it happens every day in small steps.

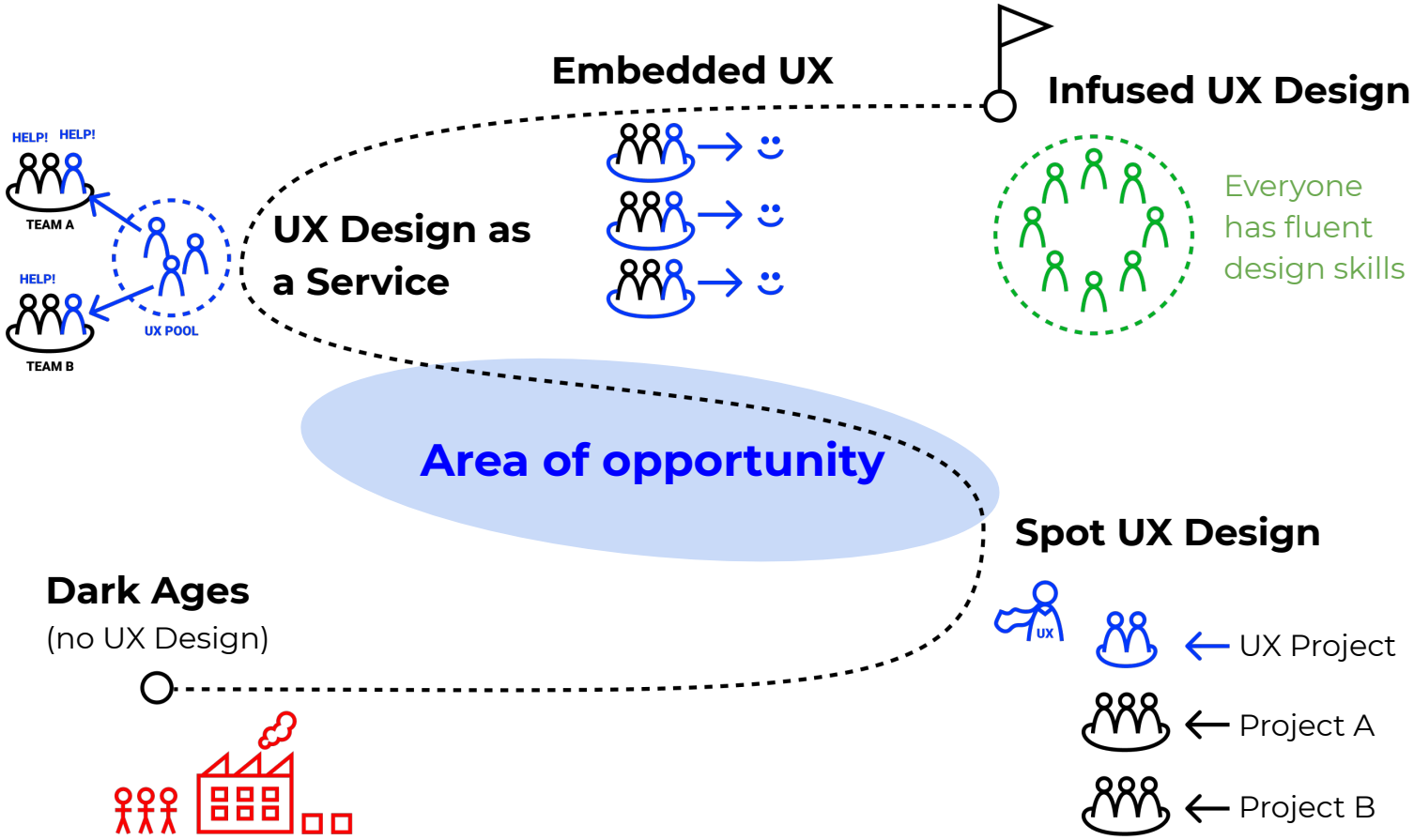
5 Stages of UX Design Maturity

by Jared Spool



5 Stages of UX Design Maturity

by Jared Spool



What is DesignOps?

- Bridge between product/sales, engineering, and design
- Design delivery pipeline (design process)
- Build and strengthen product features
- Keep the design/UX accessible (WCAG guidelines)
- User research
- Active feedback loop with the customer
- Strategic planning with product/sales

Facility Management

Facility management (FM) in a hospital complex

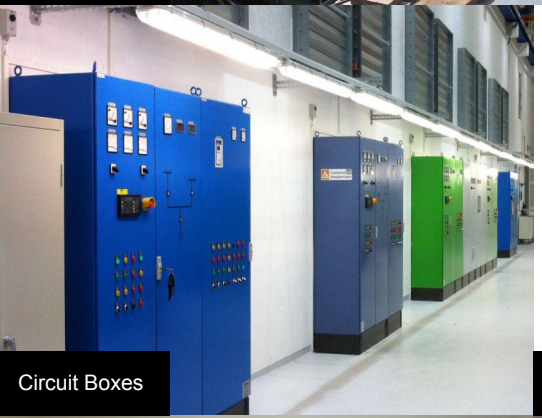
LMU Klinikum Großhadern in Munich Germany, built in 1977 expanded until today. With over 2.000 beds, over 10.000 staff, approx. 1.800 physicians, and 500.000 patients per year. One of the largest clinic complexes in Europe.

LMU Klinikum Großhadern

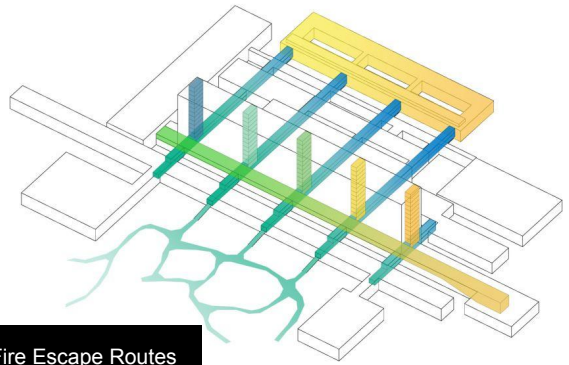
HVAC Units

Power plant

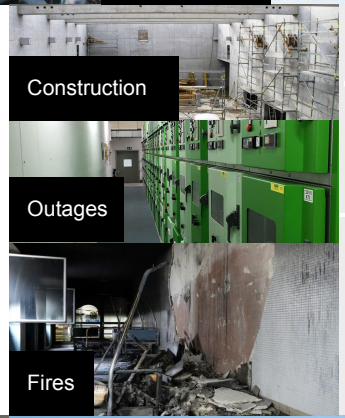
Generators



Circuit Boxes



Fire Escape Routes



Construction

Outages

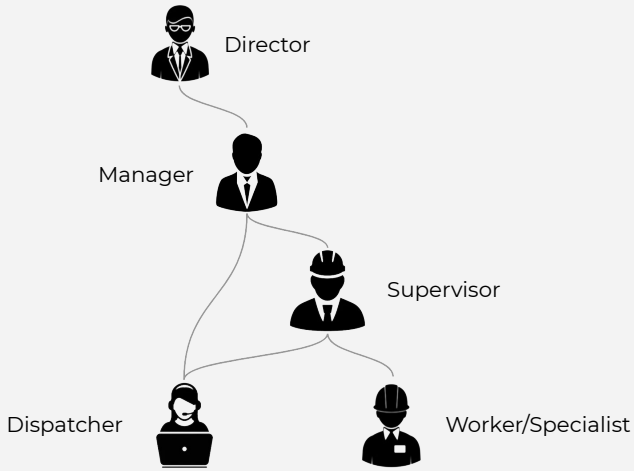
Fires

IC Unit

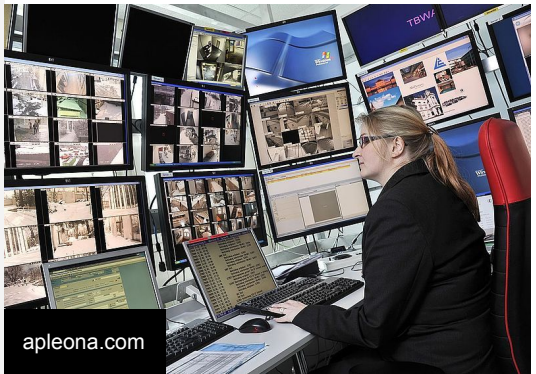
Fire Elevators

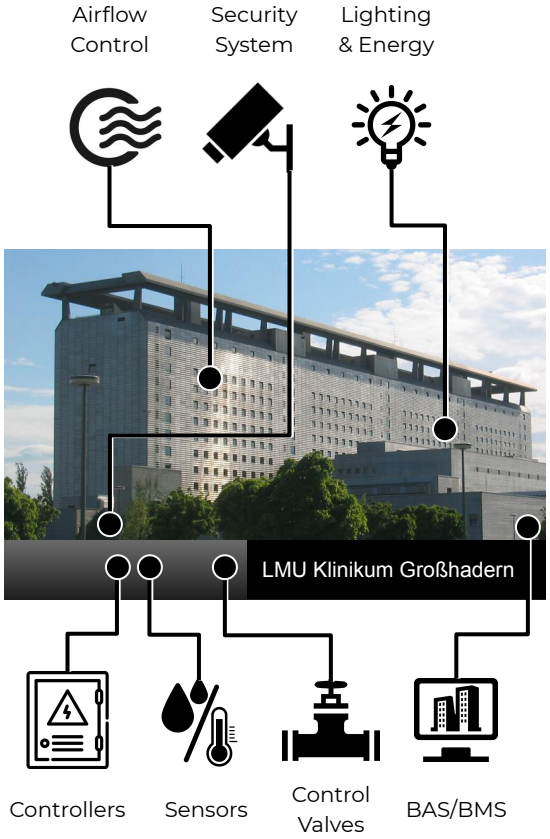
LMU Klinikum Großhadern

User Personas



- Age 35-65 (aging workforce)
- Union Workers
- Veterans
- Engineering degrees
- Limited resources





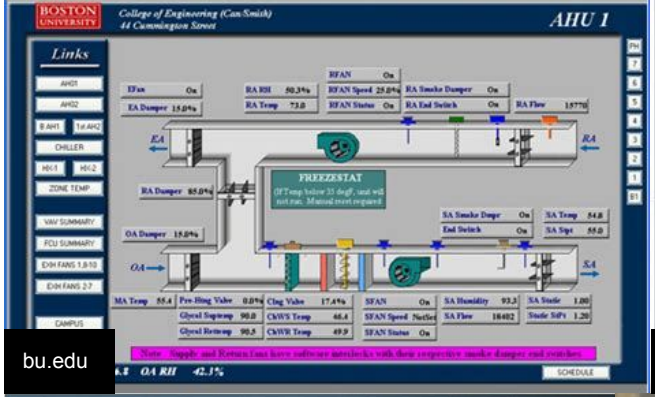
FM Tools

- cognitive overload

- no color-a11y

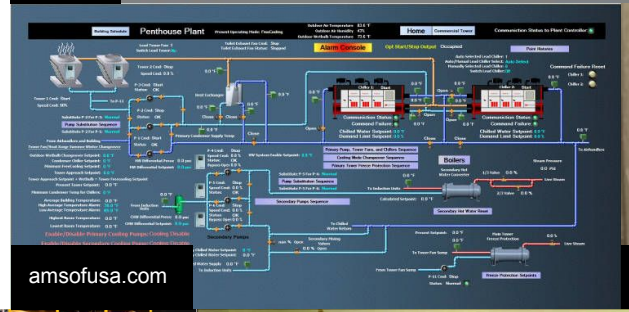
- flat visuals for a spatial environment

- keyboard accessible

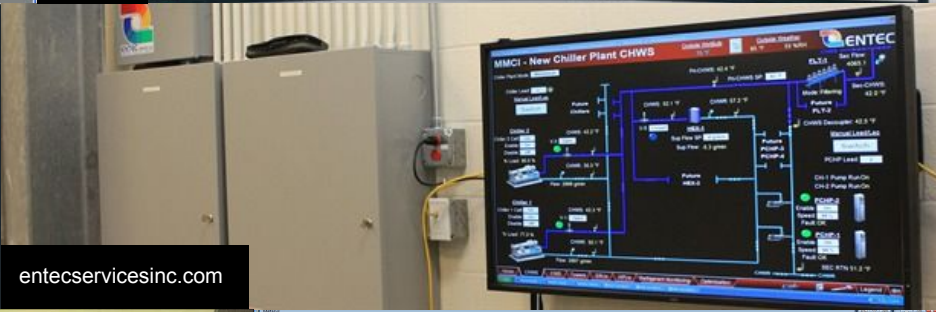


bu.edu

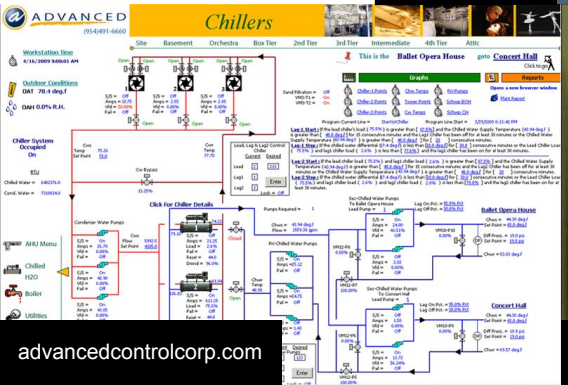
iconics



amsofusa.com

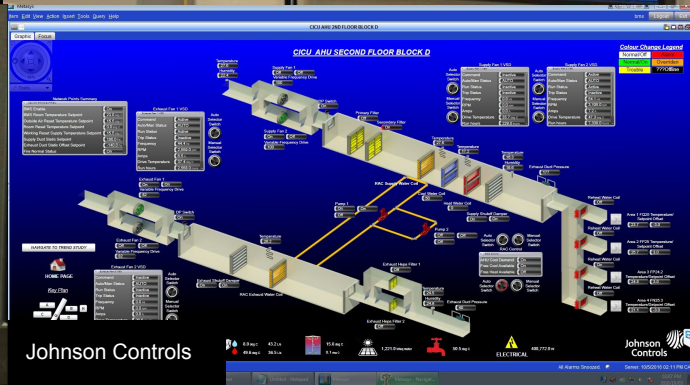


entecservicesinc.com



advancedcontrolcorp.com

Siemens Desigo



Johnson Controls

Customer Pain Points

FM team is working reactively rather than proactively

Operation and quality of work can't be measured

Building automation system (BAS) alarm data doesn't provide meaningful context

Budgets are tight and resources (workers) are limited

Root causes of problems are impossible to discover quickly

Opportunities to explore

- ✔ Displaying Alarms in one concise and contextualized way
- ✔ Tracking quality of work
- ✔ Presenting clean and accessible interfaces

Traditional 2D data-visualization (on the product roadmap)

- **Where is the problem located?**
  Show alarm data in a spatial context
- **What is the context, root cause of the problem?**
  Show other alarms in spatial relationships
- **Where is the person to solve the problem?**
  Show the position of the workforce
- **How can we measure to improve resource management?**
  Calculate how long it will take to get a worker to check and solve the problem

Opportunity for web-based 3D / XR visualization (outside the product roadmap)

Ideas That Don’t Fit

What if your ideas don’t fit the product roadmap?

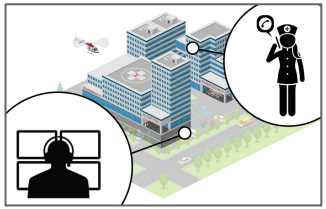
Hypothesis
Visualizing alarm data in its spatial context improves the speed and quality of problem assessment and resolution.

Challenge
Keeping the app interface …
- keyboard accessible
- screen readable
- progressively enhancing: 2D ⇨ 3D ⇨ AR/VR

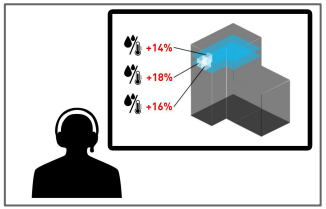
What if your ideas don’t fit the product roadmap?

1. Create an ideal user story
2. List the user pain points
3. Abstract and generalize
4. Share your goals and build a minimum viable product (MVP)

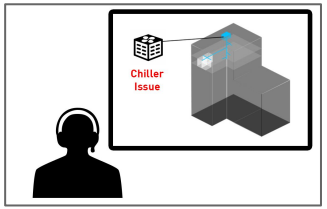
1. User Story



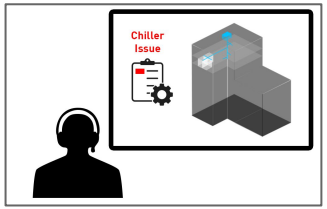
The dispatcher receives a call from a nurse about high temperatures in the OR



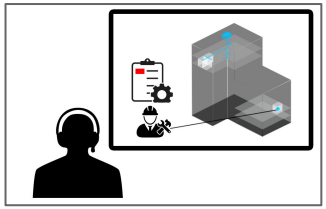
The dispatcher looks at the alarm data coming from sensors in rooms on the floor



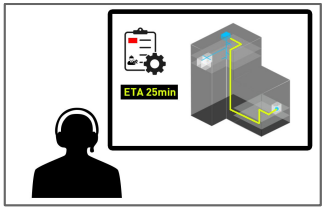
The dispatcher sees an issue with the chiller



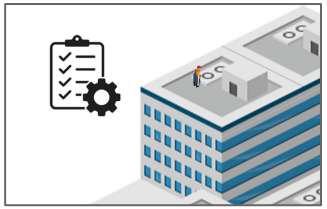
The dispatcher adds the chiller issue on a work order



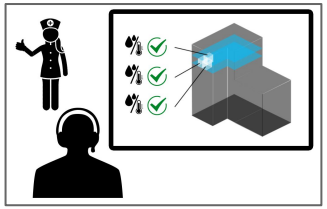
The dispatcher looks for a specialist to send to fix the chiller issue



The dispatcher sends out the work order and sees time estimate when the work will start



Worker receives a work order and fixes the chiller and completes the work order



The dispatcher sees that the room temperature returned to a normal range - the work was successful

2. List of pain points

- Where is the problem located?
- What systems are connected or close to the problem?
- Where is the worker to solve the problem?

Data quality problem

- How long will it take for the worker to get there?
- When is the problem solved?

Math problem

- How can the software create 3D models without needing external resources?
- ***Need:*** Scalable device-independent and easily maintainable solution
- ***Need:*** Accessible for screen-readers and keyboard navigation, AT

Logistical problem

3. Abstract and generalize

- Static objects (locations) and moving objects (people) with property data (metadata)

- Calculating the distance between objects and estimating time
- Indoor navigation, travel paths

- Open-source code stack
- Converting 2D SVG/Canvas drawings into 3D models

Data quality problem

Math problem

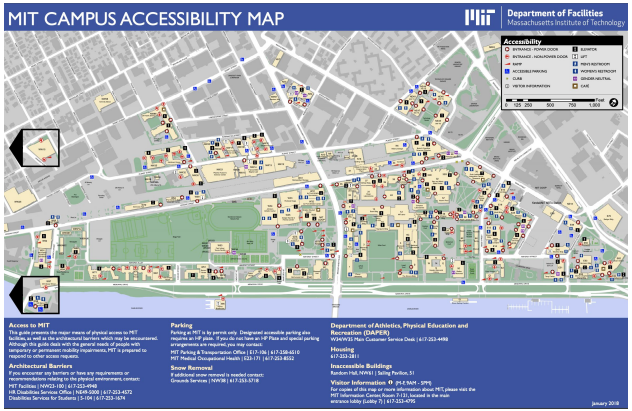
Logistical problem

3. Abstract and generalize

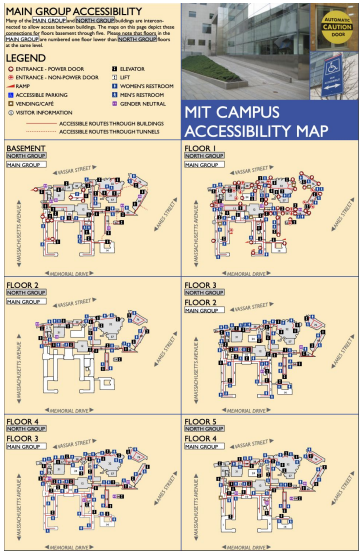
Government-funded institutions (e.g. hospitals, research labs, educational facilities, and universities) **aren't able to showcase** their **buildings in an interactive 3D way** because there is no fallback for assistive technology.

Why?

- Strict ADA compliance guidelines.
- Section 508, 503.
- No standards for accessible 3D and XR experiences.
- Current solutions seem sufficient.



https://web.mit.edu/campus-map/pdf/mit-accessibility-color-current.pdf

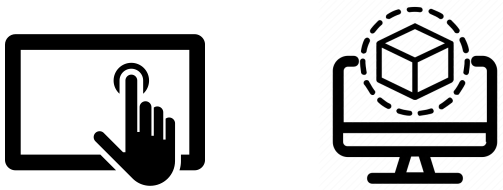


4. Share your goals

As a user, I want to ...
- be able to navigate digital buildings with any device in any dimension.
- know where to go and how long it will take to get there.

Devices: mobile, tablet, desktop, VR headset and AR glasses.

1D
TTS, screen readers



2D/3D
Flat screens, touch displays

AR/VR/MR
Mobile, HMD, and glasses

Find Your Hackathon

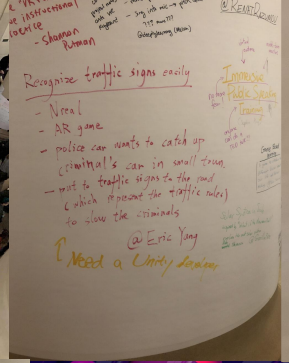
Find Your Hackathon

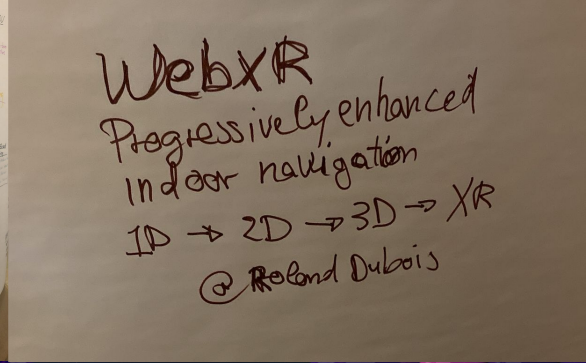
Choose an event that provides enough time and support for you to realize your MVP

- **Look for industry specific events**
  AEC Hackathon, AT&T Hackathon, T-Mobile Hacktober, XR Edu Challenge
- **Look for university sponsored events**
  MIT Reality Hack, NYUAD Hackathon, HackXR (UCSD), HackPrinceton,
- **Consider length of the event**
  SXSW Hackathon (24h)

- Who's attending? Is it inclusive, are there efforts towards *a11y*?
- What's the event mission? Is there an alignment with your project?
- Browse on Devpost

Hack & Open-Source


Recognize traffic signs easily
- Neal
- AR game
- police car wants to catch up criminal's car in small town
- want to traffic signs & the sound which represent the traffic rules to slow the criminals
@ Eric Yang
Need a Unity Developer


WebXR
Progressively enhanced
Indoor navigation
1D → 2D → 3D → XR
@ Roland Dubois

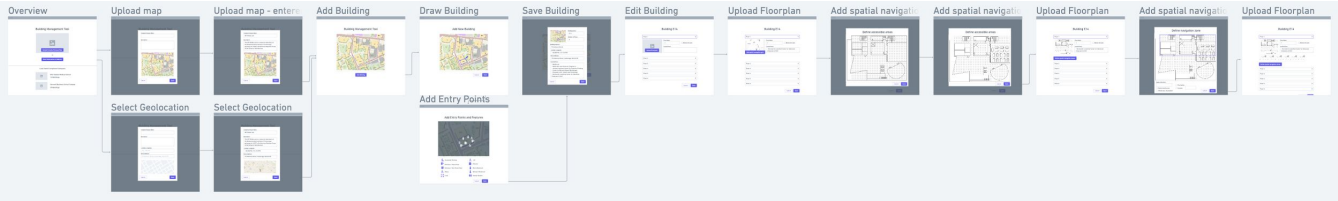

FIRE
EMERGENCY DEFIBRILLATOR
AED
REALITY
HACK
MIT XR HACKATHON

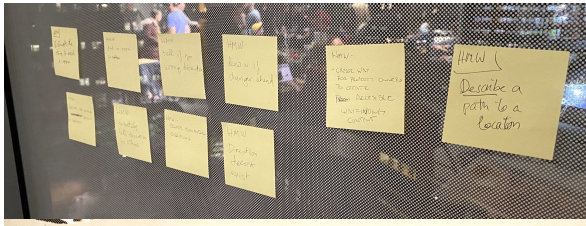

REALITY
HACK
MIT XR HACKATHON
MIT Reality Hack - January 16-20, 2020

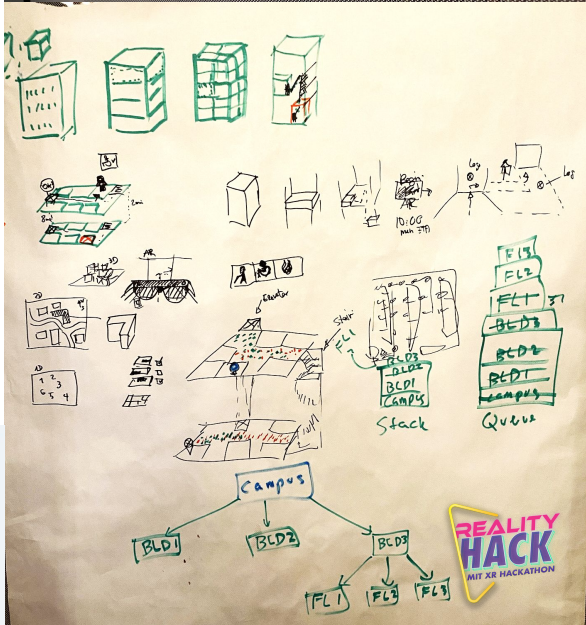
Hackathon Title: *ProgressivelyEnhancedIndoorNavigationWebXR*

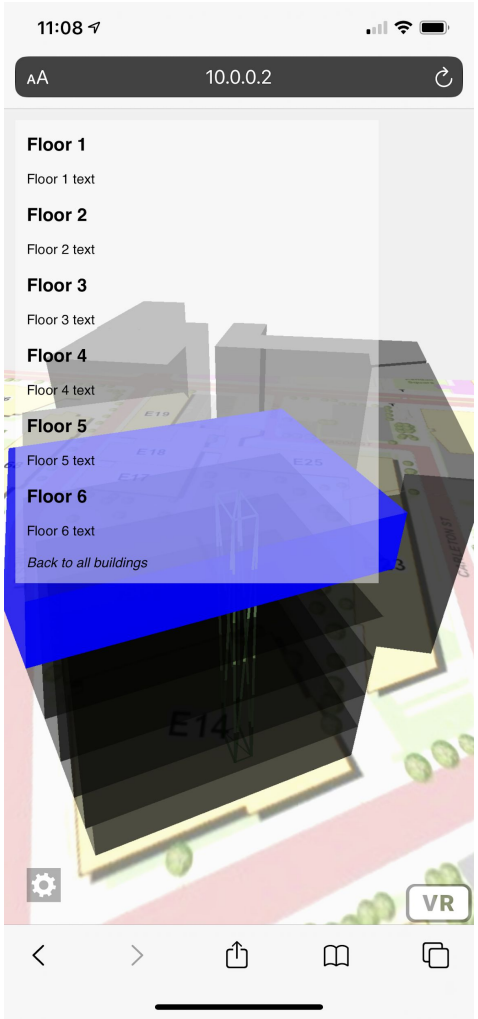
Feature goals:

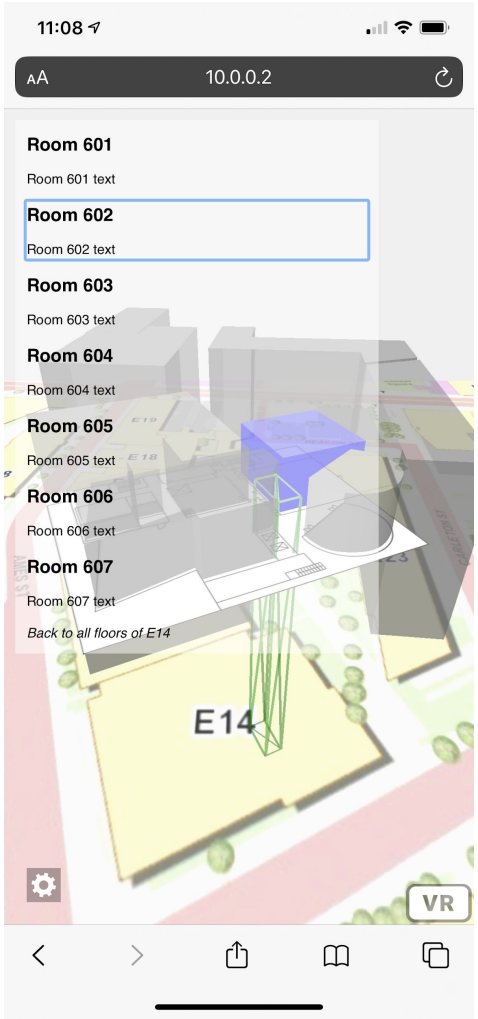
- Scalable ecosystem
- Low entry barrier
- Open-source code
- Device independency
- Web-based framework
- User-relevant metadata inside a building











E14

Located here: Media Lab, Program in Media Arts and Sciences, Jerome Lemelson Center for Inventive Thinking, Center for Bits and Atoms (Workshops), Program in Art, Culture and Technology, Norman B. Leventhal Center for Advanced Urbanism (LCAU). Address: 75 Amherst Street

Wiesner Building (E15)

Located here: Bartos Theater, Office of the Arts, Media Lab, Center for Bits and Atoms (Offices, Labs), Program in Art, Culture and Technology, Comparative Media Studies/Writing (CMS/W), Program in Media Arts and Sciences, Music, Mind and Machine, List Visual Arts Center, Media Arts and Sciences Freshman Program. Address: 20 Ames St, Cambridge, MA 02139

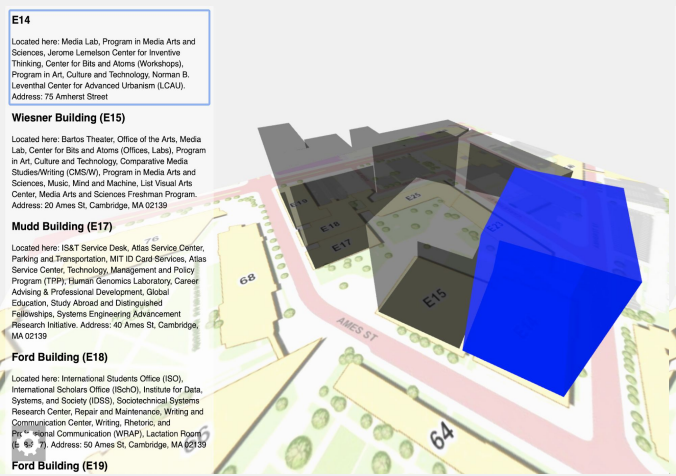
Mudd Building (E17)

Located here: IS&T Service Desk, Atlas Service Center, Parking and Transportation, MIT ID Card Services, Atlas Service Center, Technology, Management and Policy Program (TPP), Human Genomics Laboratory, Career Advising & Professional Development, Global Education, Study Abroad and Distinguished Fellowships, Systems Engineering Advancement Research Initiative. Address: 40 Ames St, Cambridge, MA 02139

Ford Building (E18)

Located here: International Students Office (ISO), International Scholars Office (ISchO), Institute for Data, Systems, and Society (IDSS), Sociotechnical Systems Research Center, Repair and Maintenance, Writing and Communication Center, Writing, Rhetoric, and Professional Communication (WRAP), Lactation Room (E. Address: 50 Ames St, Cambridge, MA 02139

Ford Building (E19)



Floor 1

Floor 1 text

Floor 2

Floor 2 text

Floor 3

Floor 3 text

Floor 4

Floor 4 text

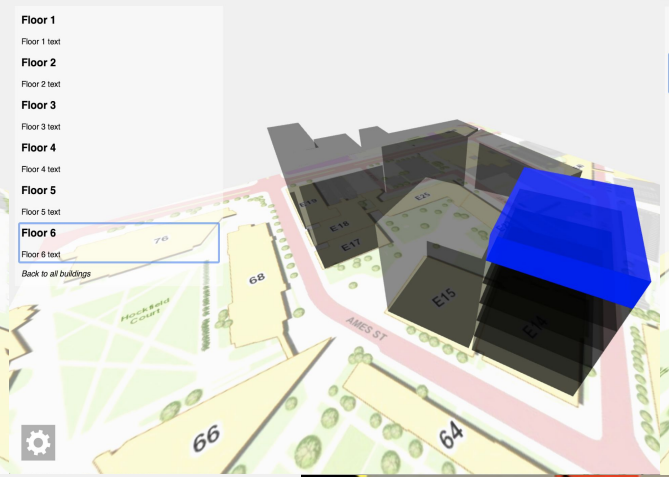
Floor 5

Floor 5 text

Floor 6

Floor 6 text

Back to all buildings



Room 601

Room 601 text

Room 602

Room 602 text

Room 603

Room 603 text

Room 604

Room 604 text

Room 605

Room 605 text

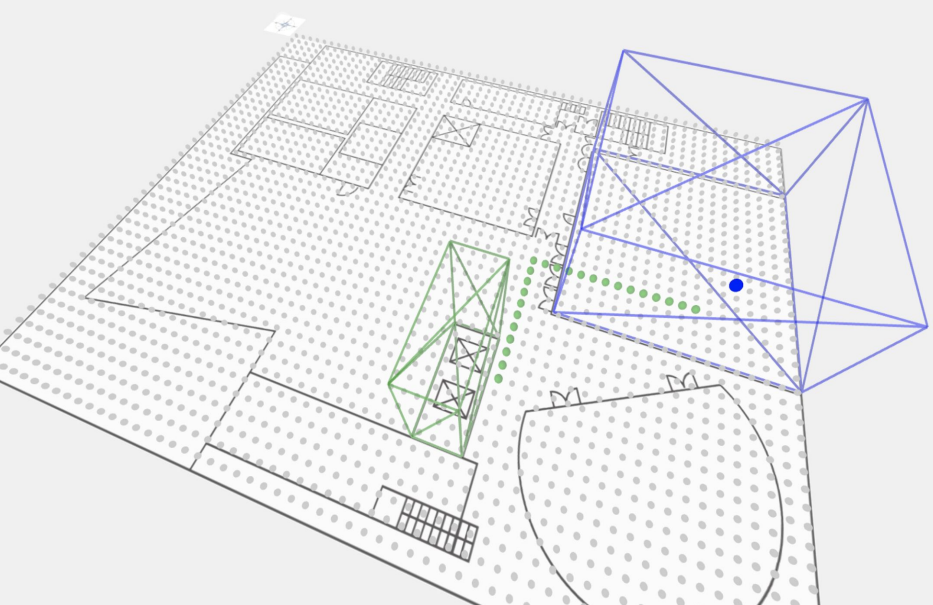
Room 606

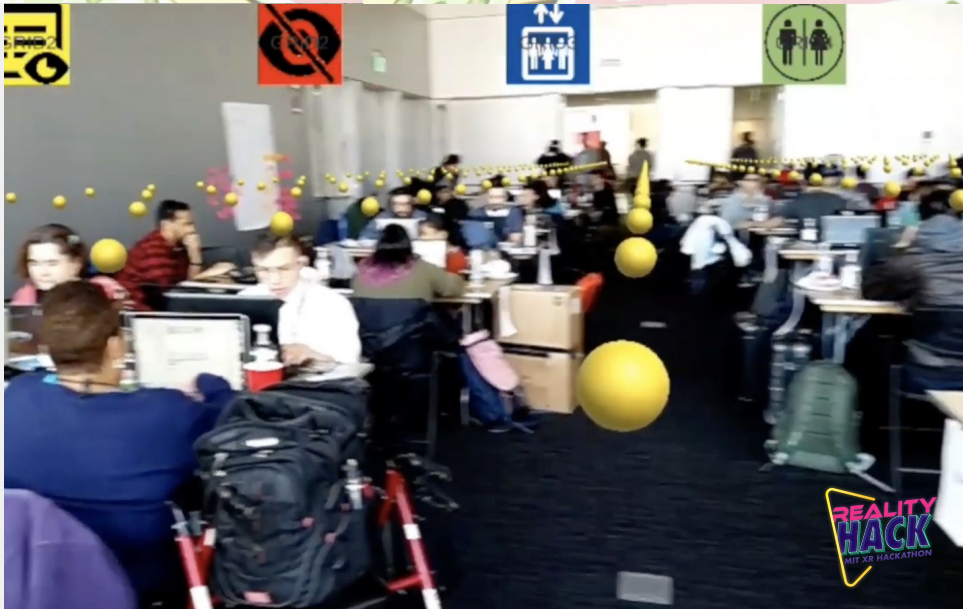
Room 606 text

Room 607

Room 607 text

Back to all floors of E14



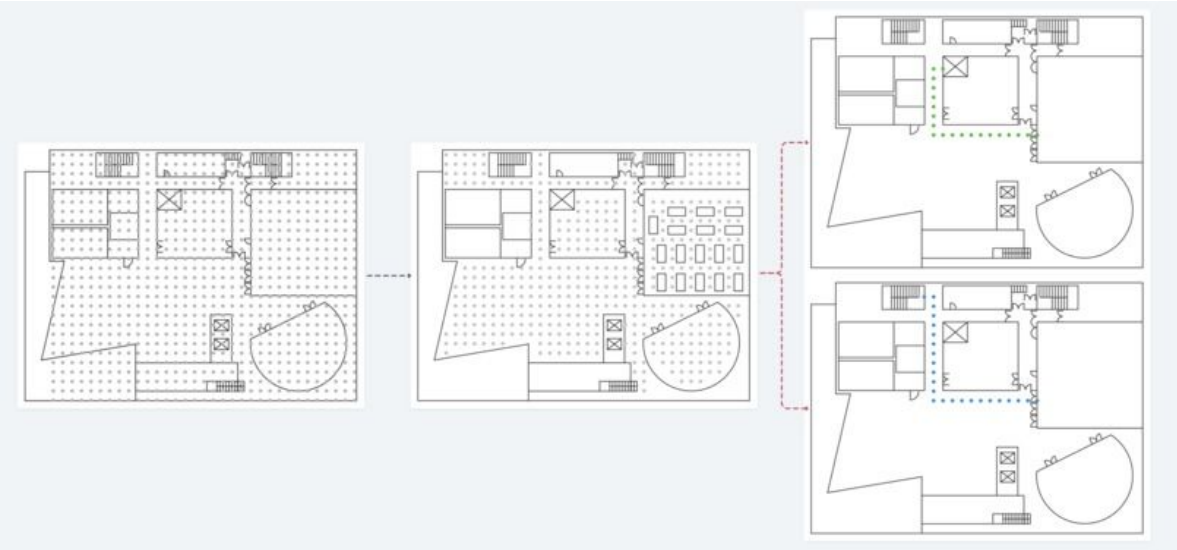


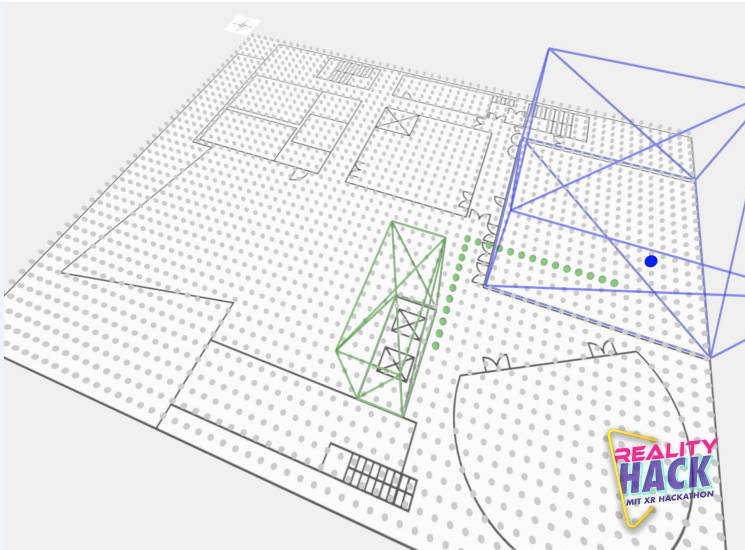
Challenges with Indoor Navigation

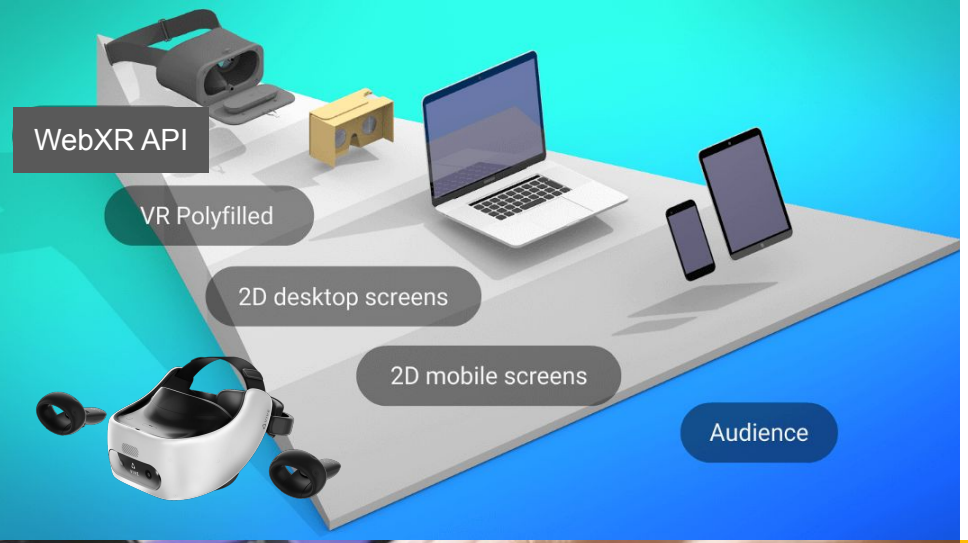
- Imprecision in directions
- Navigation of unknown areas
- Lack of visibility and occlusion
- Unknown spatial conditions (construction)
- Unreliable mapping
- Definition of indoor boundaries (manual, time consuming)
- User orientation and position (hard to define)

Our Solution for Indoor Navigation

Creation of a spatial navigation grid.
Enabling a safe and effective indoor guidance system for users.
Inspired by “grid pathfinding” in game development.







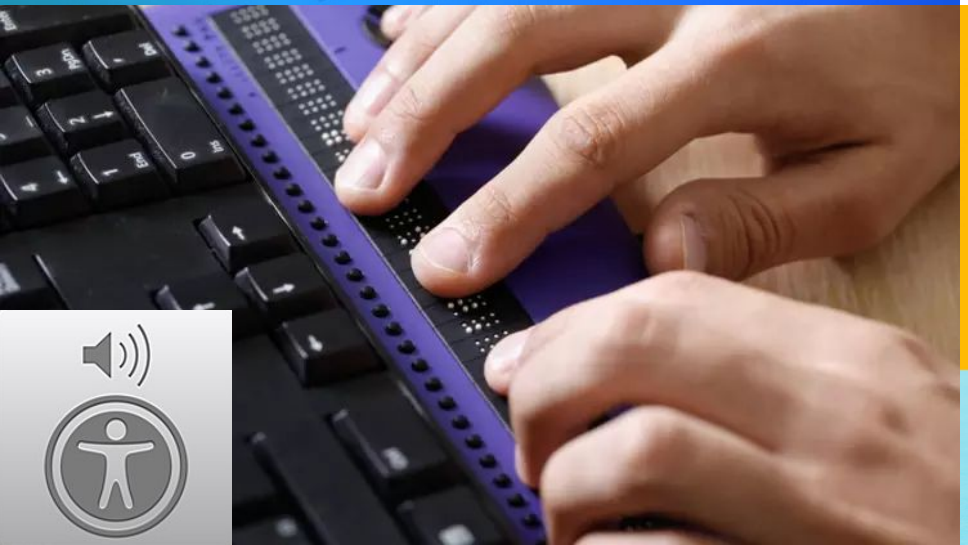
three.js

Azure

HTML JS CSS

vuforia™

unity

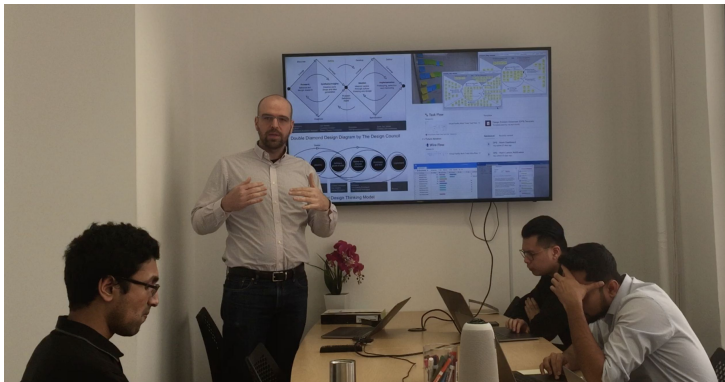


Usertest your project with other hackers!

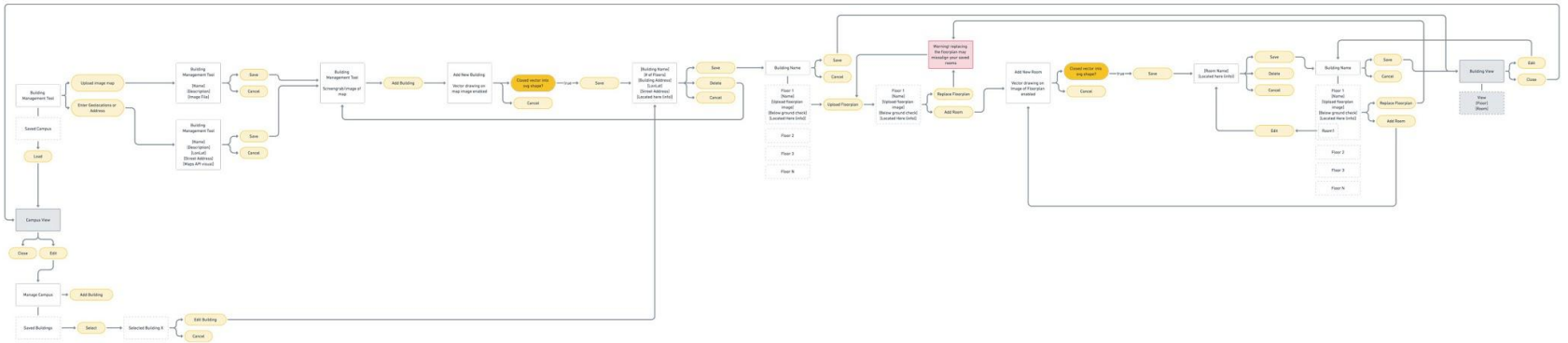
Build Your Case At Work

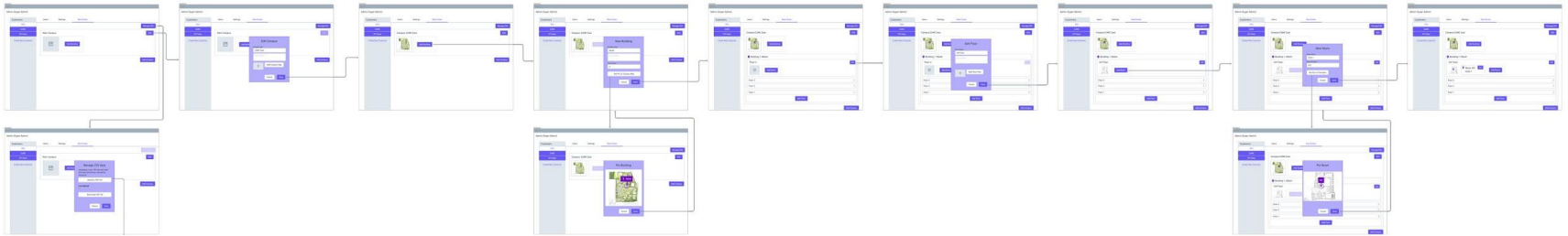
Build Your Case At Work

- Share your hackathon project in a lunch & learn
- Showcase what user pain points your project solves including user test results / collected feedback
- Re-adapt your hackathon project to the initial product feature
- Create task flows, wireframes and a clickable prototype
- Put your idea into the product roadmap



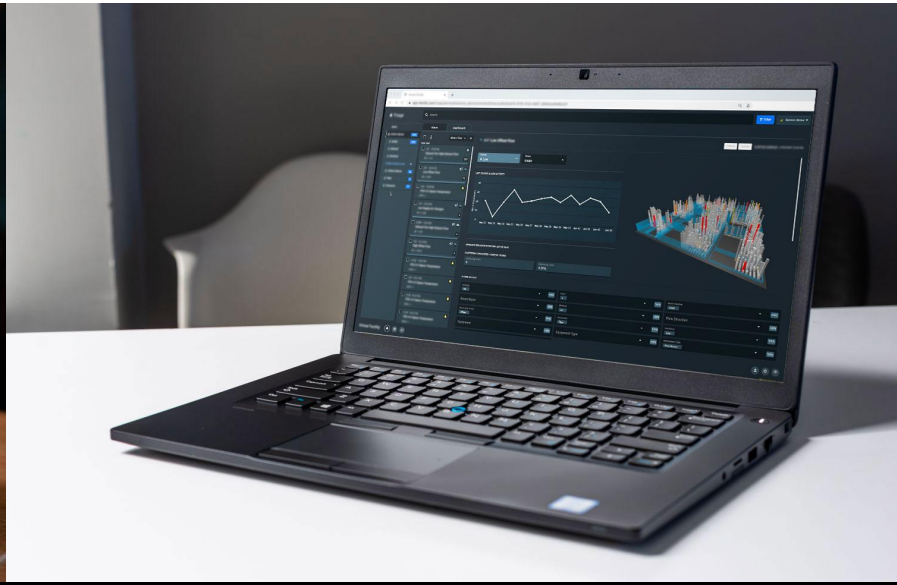
Build Your Case At Work





Build Your Case At Work

Looking Glass Factory - Holographic touch display



3D visualization on a laptop browser

Recap

Design & Maturity

Facility Management

The Ideas That Don’t Fit

Find Your Hackathon

Hack & Open-Source

Build Your Case At Work


WAKANDA FOREVER
WEBAR BOOTH


WebVR Authoring
W3C
/digityser
/digityserbe
#digityser
/digityser
DIGITYSER
DIGITYSER


Open Innovation
Challenges
moz://a
NYC
immersive
NEW YORK
THE NEW SCHOOL
PARSONS


MIT
REALITY
Accessible Locomotion Web XR
Five Hundred
Dev App for Accessibility


Welcome
to
NYC
&
Immersive NYC
A-Frame NYC
at prosperity Innovation Festival 2
prosperity


GRAVR
A GLOBALLY
RECOGNIZED
VATAR
R VR
THE WEB
GRAVR


WebXR
NEW YORK


FERGUSON
VR
HACKATHON

Get in Touch

@rolanddubois
www.rolanddubois.com
linkedin.com/in/rolanddubois

Resources

Design Maturity
https://articles.uie.com/beyond_ux_tipping_point/
https://uxdesign.cc/a-framework-for-measuring-design-maturity-8fdb578e82c

Hackathons
Devpost, AEC Hackathon, AT&T Hackathon, T-Mobile Hacktober, XR Edu Challenge, MIT Reality Hack, NYUAD Hackathon, HackXR (UCSD), HackPrinceton,SXSW Hackathon

Accessibility Resources
https://xraccess.org/resources/
https://www.w3.org/TR/WCAG21/

WebXR
https://immersiveweb.dev/
https://www.meetup.com/A-Frame-NYC/