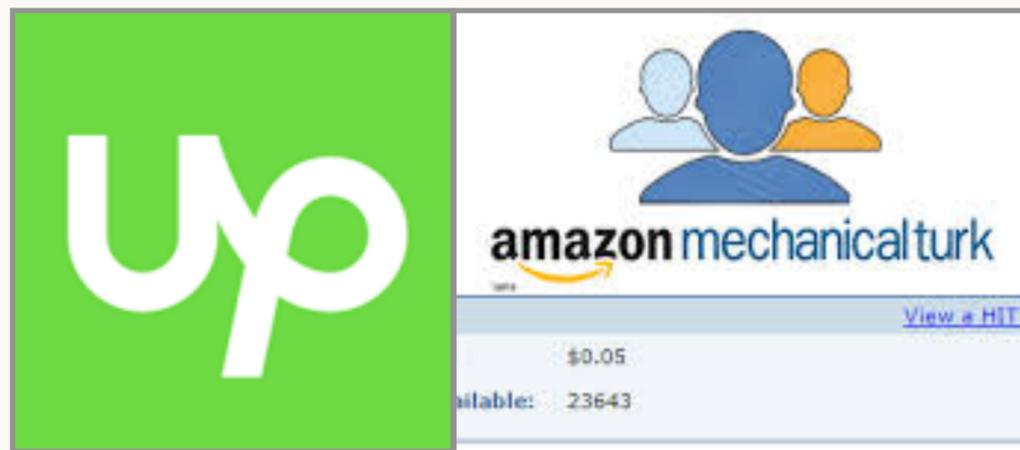


Flash Organizations

crowdsourcing complex work by
structuring crowds as organizations

CROWDSOURCING: TECHNOLOGY FOR AMPLIFYING HUMAN EFFORT

Open call recruitment from a globally-distributed workforce
[Howe 2008]



Online labor markets



Open innovation



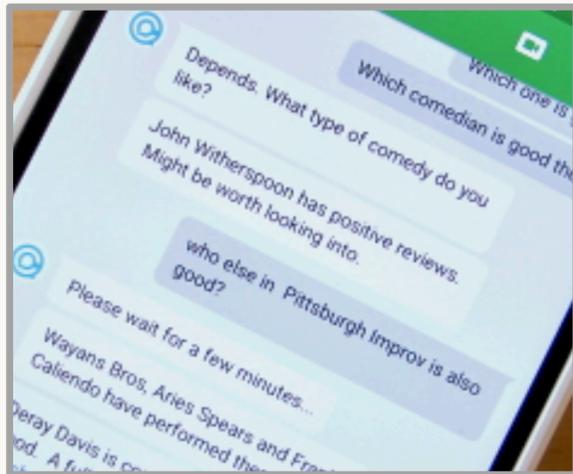
WIKIPEDIA



Linux

Peer production

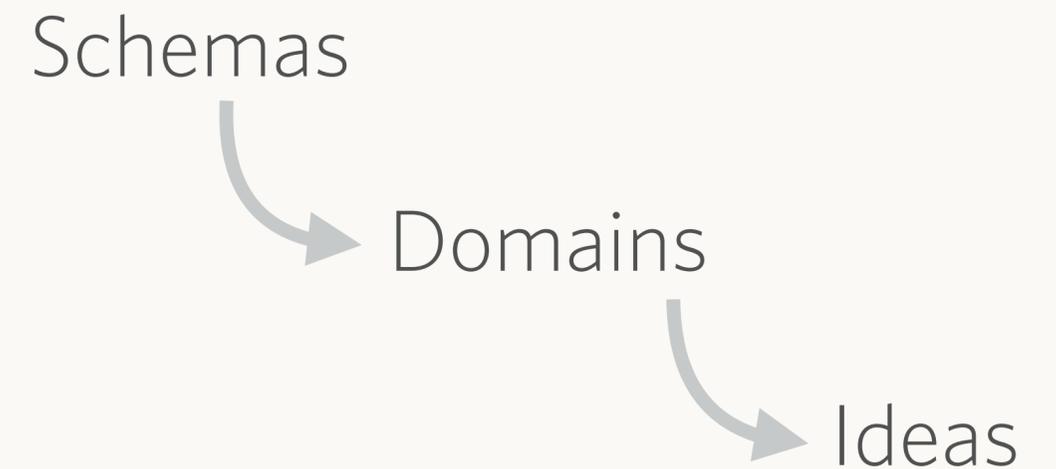
CHALLENGE: OPEN-ENDED AND COMPLEX GOALS



[Lasecki 2013]



[Retelny 2014]



[Yu, Kittur and Kraut 2014]

...but goals such as invention, production, and engineering remain largely out of reach

[Kittur et al. 2013]

THE LIMITS OF ALGORITHMS

Open-ended and complex goals are fundamentally incompatible with a requirement to pre-define all behaviors
[Van de Ven, Delbecq, and Koenig 1976; Rittel and Weber 1973; Schön 1984]

This architecture confines crowdsourcing to goals so predictable that they can be entirely pre-defined

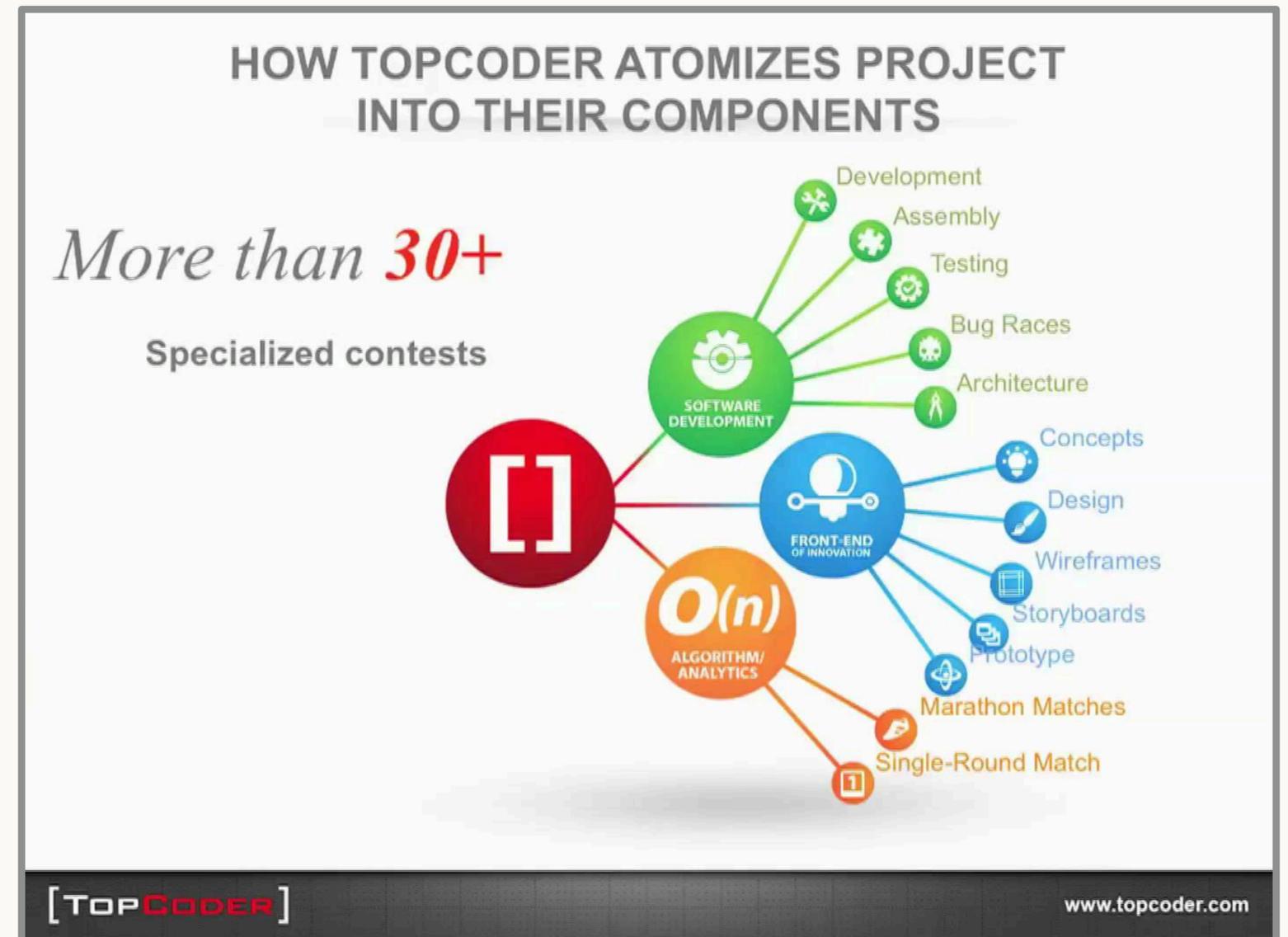
A LIMIT IN OPEN SOURCE AND OPEN INNOVATION AS WELL

“Peer production is limited not by the total cost or complexity of a project, but by its modularity”

[Benkler 2002]

“With the Linux kernel [...] we want to have a system which is as modular as possible. The open-source development model really requires this, because otherwise you can't easily have people working in parallel.”

[Torvalds 1999]



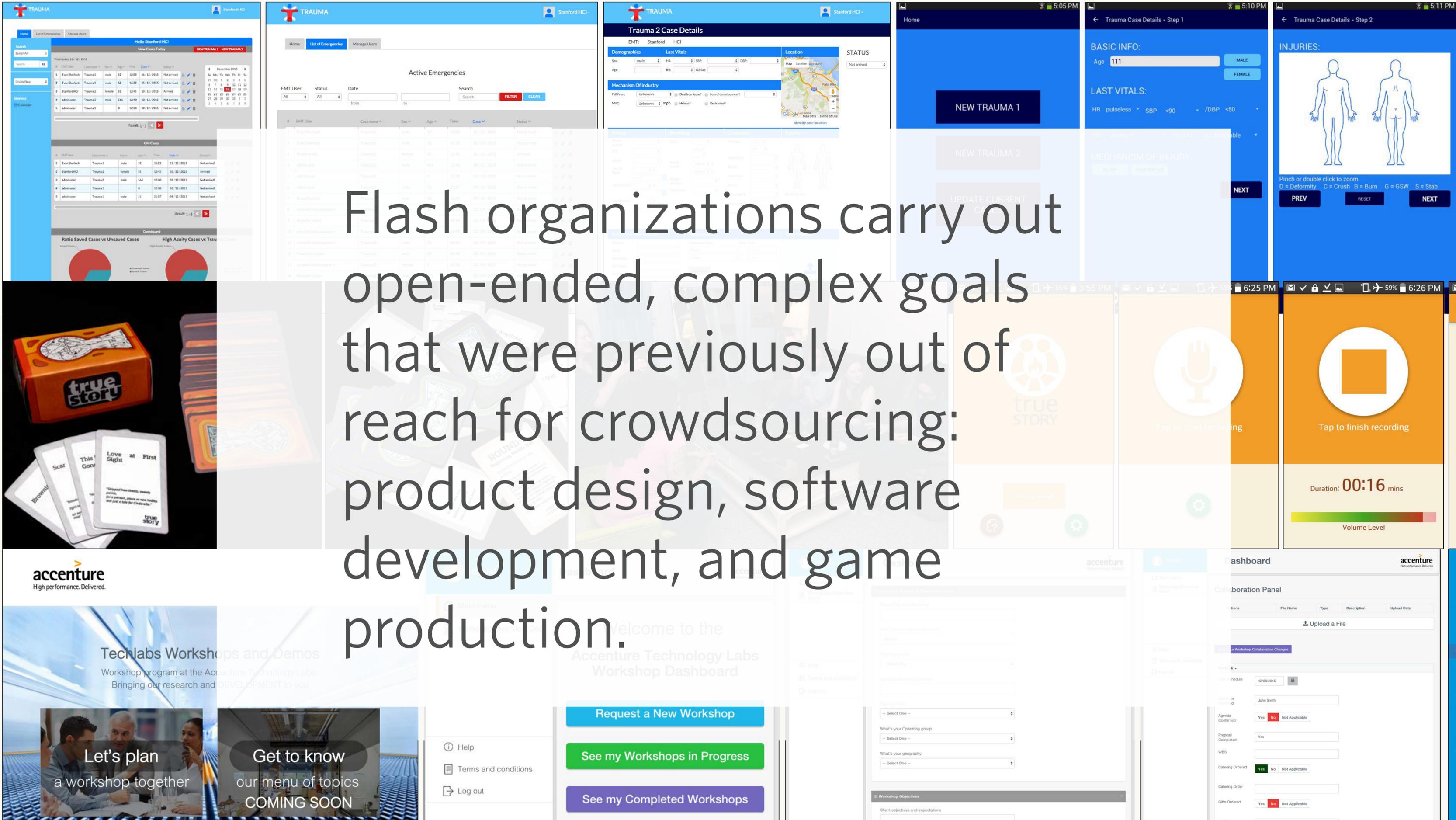
[Boudreau, Lacetera, and Lakhani 2011]

THE CHALLENGE

The approach that gives crowdsourcing systems their leverage is also preventing them from achieving complex and open-ended outcomes

**An alternative architecture:
crowds structured not like
algorithms, but like
organizations**

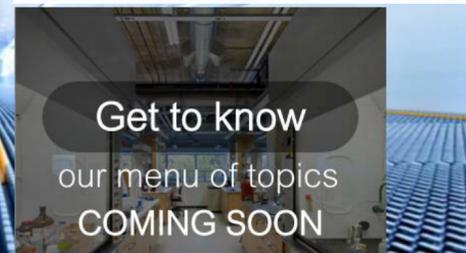
**Flash organizations:
rapidly assembled and
reconfigurable
organizations composed of
online crowd workers**



Flash organizations carry out open-ended, complex goals that were previously out of reach for crowdsourcing: product design, software development, and game production.



Techlabs Workshops and Demos
Workshop program at the Accenture Technology Labs:
Bringing our research and DEVELOPMENT to you



- Help
- Terms and conditions
- Log out

Request a New Workshop

See my Workshops in Progress

See my Completed Workshops

Welcome to the
Accenture Technology Labs
Workshop Dashboard

1. Workshop Details

Please fill in your details

What's your name?
[Text Field]

What's your phone number?
[Text Field]

What's your email?
[Text Field]

What's your organization?
[Text Field]

What's your role?
[Text Field]

What's your operating group?
[Text Field]

What's your geography?
[Text Field]

2. Workshop Objectives

Client objectives and expectations
[Text Area]

Dashboard

Collaboration Panel

File Name	Type	Description	Upload Date
Upload a File			

3. Workshop Collaboration Changes

Workshop Schedule: 12/08/2015

Workshop Lead: John Smith

Agenda Confirmed: Yes No Not Applicable

Pre-call Completed: Yes

WBS: [Text Field]

Catering Ordered: Yes No Not Applicable

Catering Order: [Text Field]

Gifts Ordered: Yes No Not Applicable

FOUNDRY

Web platform that supports authoring, reconfiguring, and running flash organizations

The screenshot displays the Foundry web platform interface. On the left, a sidebar contains a red menu icon and the text 'FOUNDRY'. Below this, it reads 'QUESTION AND ANSWER WEB APPLICATION' with an information icon. A welcome message says 'Welcome Daniela Retelny! Your role: UI Designer - Users'. A red notification states 'Your task (User Profile Wireframes) is delayed.' Below the notification are two buttons: 'Complete Task' (green) and 'Take a Break' (blue).

The main area features a Gantt chart with a timeline from 0:00 to 9:00. A pink banner at the top of the chart reads 'Your task (User Profile Wireframes) is delayed.' The chart shows four tasks:

- HOMEPAGE & LOGIN WIREFRAMES COMPLETED** (green bar, 0:00 to 2:00)
- NEWS FEED WIREFRAMES COMPLETED** (green bar, 3:00 to 6:00)
- QUESTION & ANSWER WIREFRAMES PAUSED** (blue bar, 3:00 to 6:00)
- USER PROFILE WIREFRAMES -2 HRS 40 MIN** (red bar, 3:00 to 5:20)

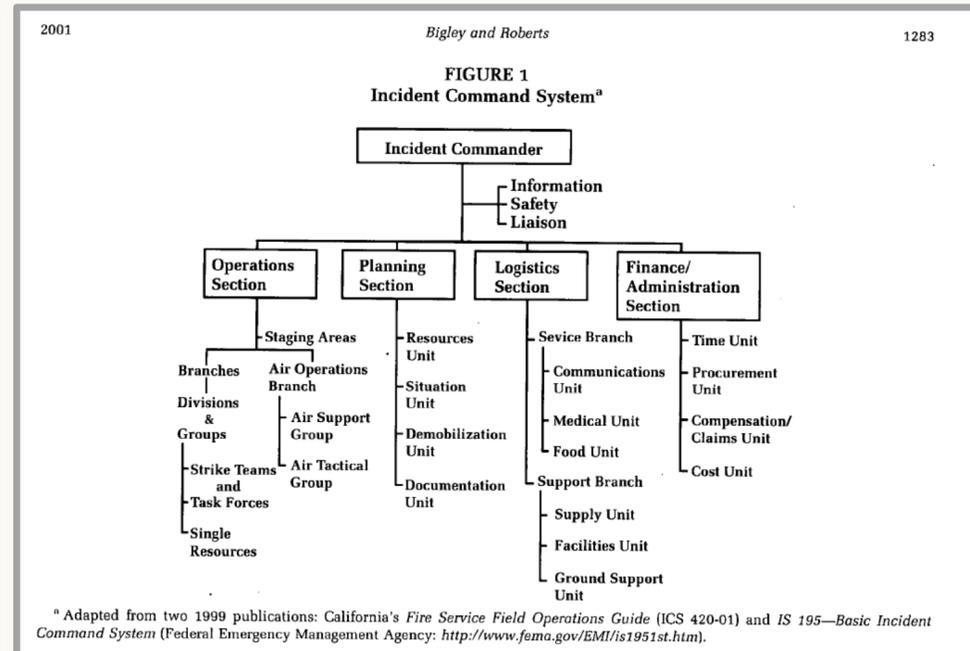
Other tasks shown include 'INTEGRATE WIREFRAMES 1 HR 45 MIN' (grey bar, 7:00 to 8:15) and 'HEUR 2 HRS' (grey bar, 9:00 to 11:00). Each task bar includes a person icon, a share icon, and a right-pointing arrow.

COORDINATION SANS ALGORITHMS

Inspiration: film crews and disaster response teams

[Bigley 2001; Bechky 2006; Klein et. al 2006; Valentine & Edmondson 2015]

Role structures enable interaction based on knowledge of roles rather than asset-specific knowledge of each other

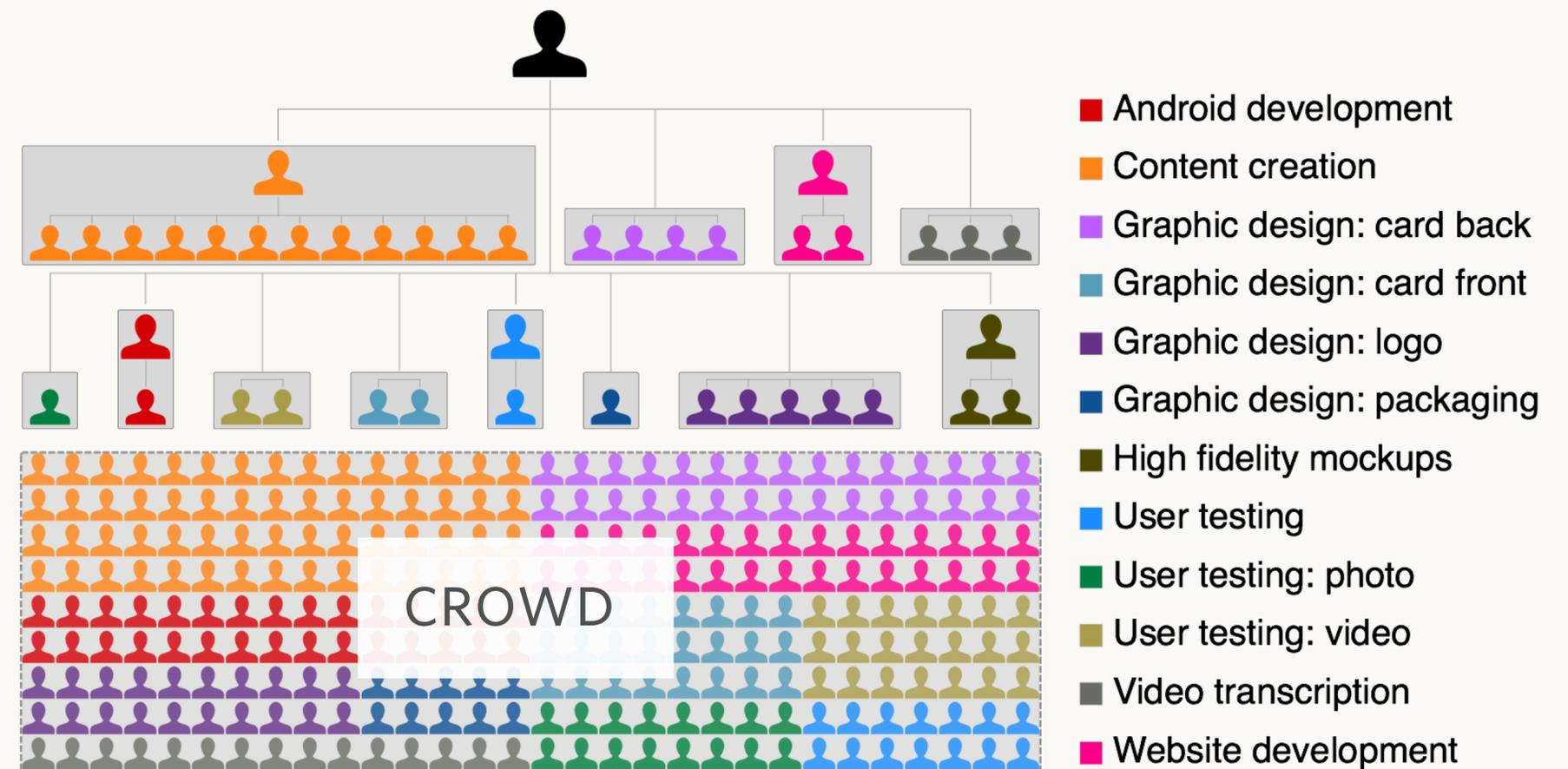


COMPUTATIONAL ORGANIZATIONAL STRUCTURES

Roles: parametrize required expertise

Teams: groups of workers with shared goal

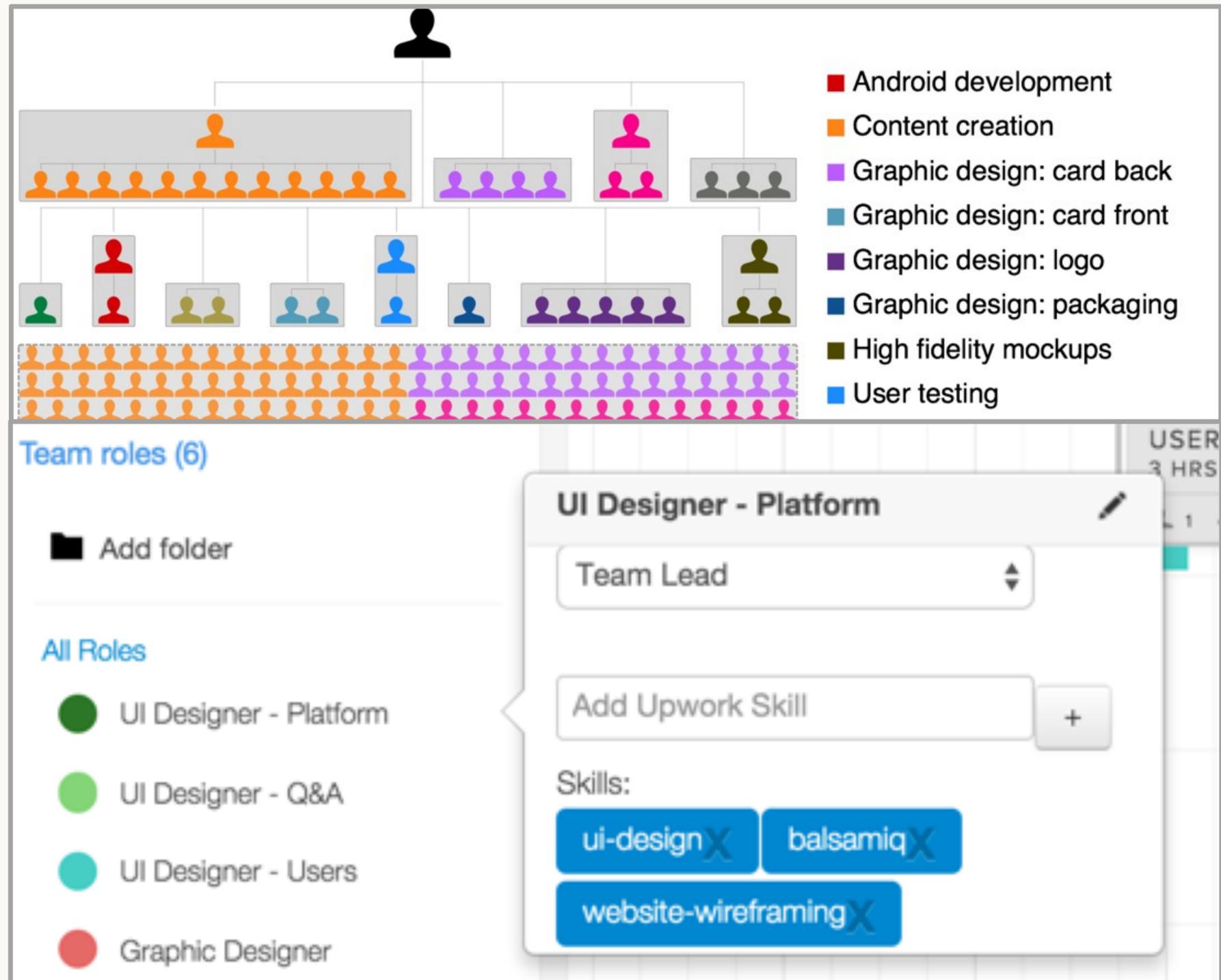
Hierarchy: nested roles that determine decision rights



FOUNDRY ROLE STRUCTURES

Map each role onto a skill in the Upwork labor market

Nest roles into teams to indicate hierarchy



ON-DEMAND HIRING FROM UPWORK

Project: Question and Answer Web Application

Task: Homepage & Login Wireframes

Position in Queue: No. 1

Deadline to Accept Position: 10 minutes

Accept this position

Decline this position

> Task Available

Congratulations! You are at No. 1 position Application project.

Please read the following information carefully the hiring queue. However, to reinforce again

Please do not close this page; this page will be removed from the hiring queue (only for this

As stated in the job description, you will have working hours on Upwork. For your reference

Project overview: Create a "Question & Answer" application and view all existing questions

Your Task

This is **YOUR** task. You can now end this tour, and **click on the task rectangle and click start** to read about your task, and start tracking work time. Note that time for reviewing the previous materials, etc. are accounted for as work time.

Pay close attention to the task description, the 'inputs' (what other workers have handed off to you), and the deliverables you are expected to create.

USER PROFILE WIREFRAMES
3 HRS 45 MIN

1

Automated, role-specific onboarding

Hiring queue

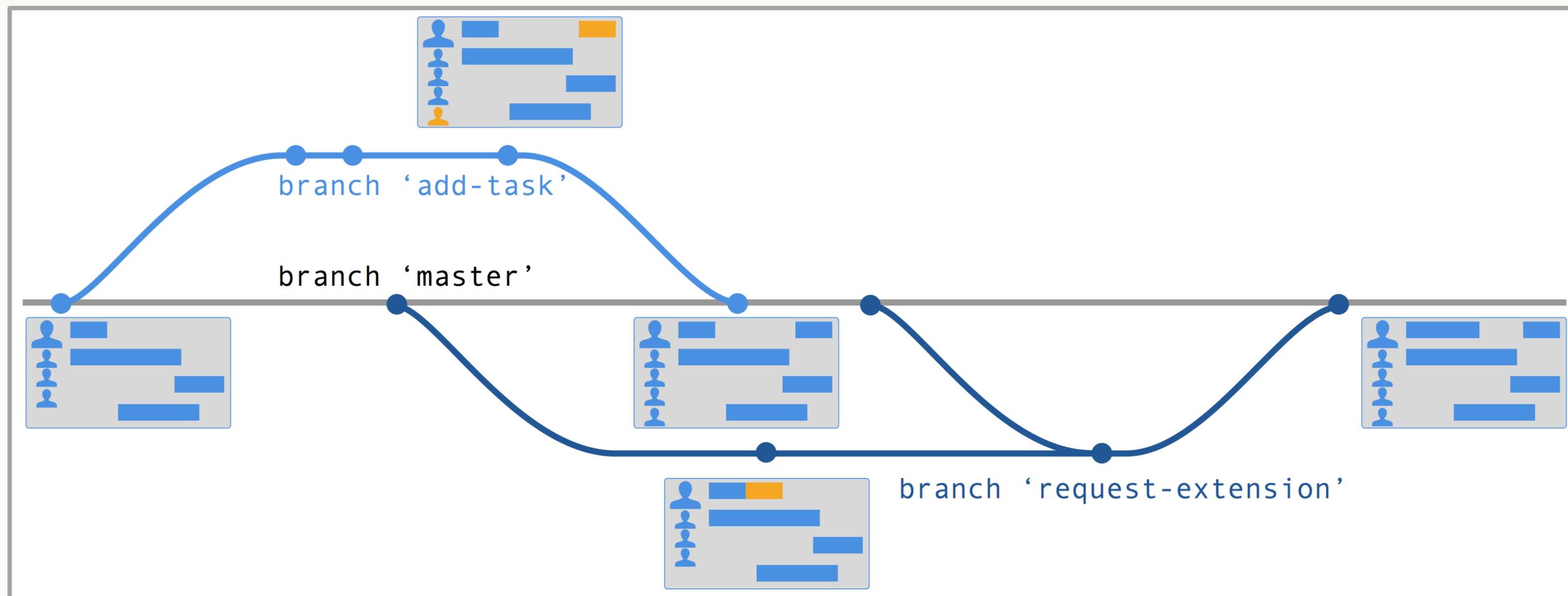
CHALLENGE: RECONFIGURATION

Organizational structures require constant reconfiguration so that the organization can adapt as it proceeds

How can a computational system keep a distributed crowd in sync as the plan evolves?

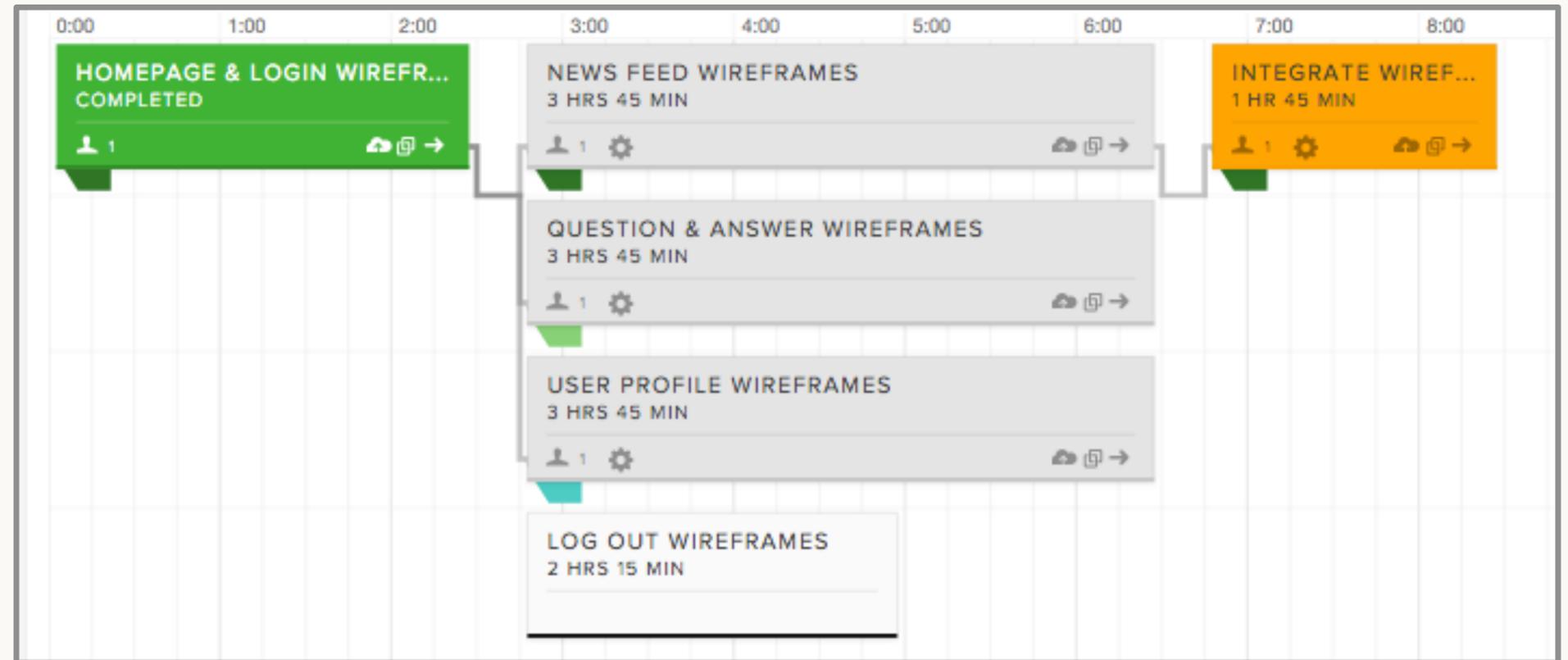
VERSION CONTROL

To enable reconfiguration of the organizational structures:
branching and merging inspired by version control



VERSION CONTROL IN FOUNDRY

Any member can branch, edit, and issue pull requests against any organizational structure: roles, teams, hierarchy, tasks



Diff view for reviewing

Pull requests are reviewed up the hierarchy and merged through a three-way diff

Flash organizations achieve complex and open-ended goals by computationally structuring the crowd like an organization, rather than like an algorithm.

Hierarchical role structures

On-demand hiring and onboarding

Branch+merge version control: roles, teams, hierarchy, and tasks

Changes come top-down and bottom-up

EVALUATION

Field study: System deployment with outside leaders willing to crowdsource their complex open-ended goals

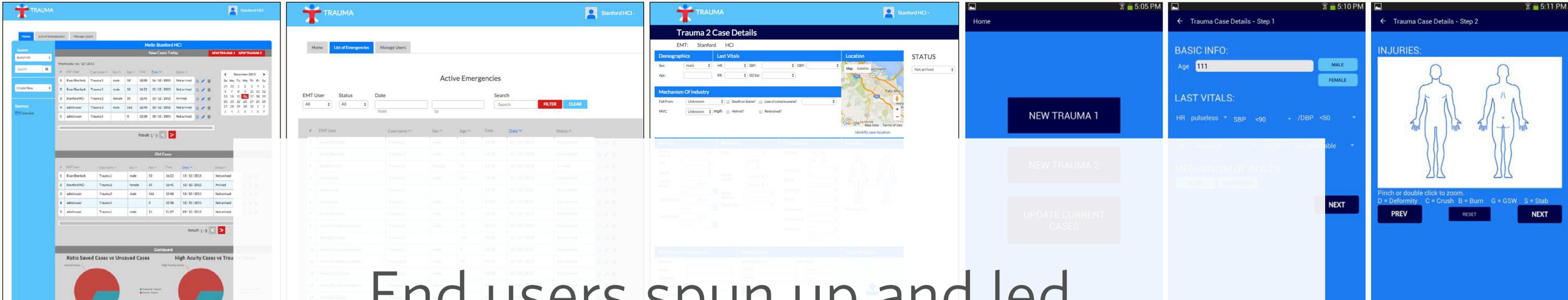
EMS Report

Leader

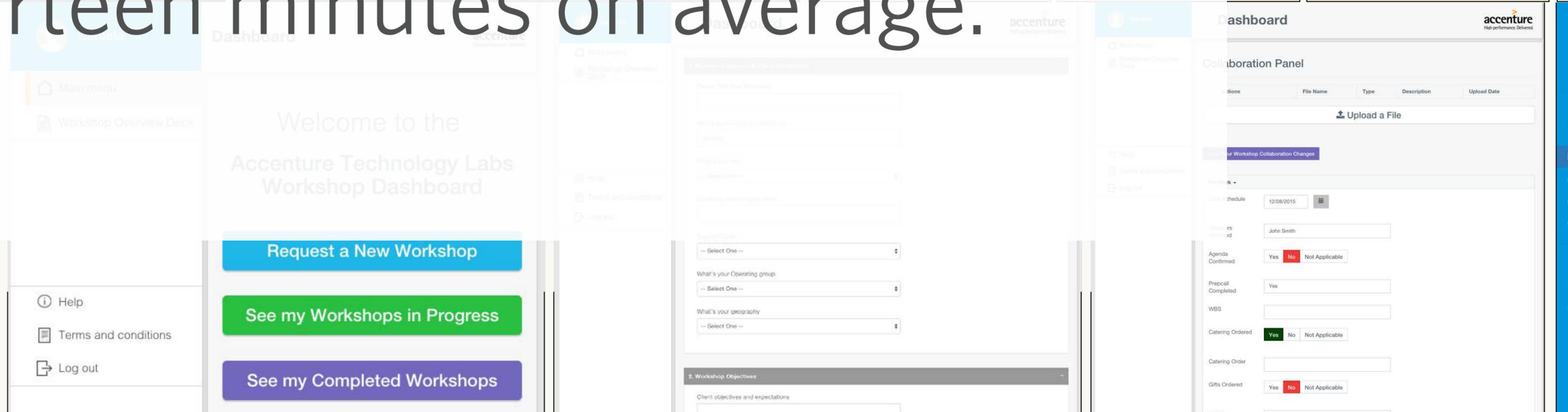
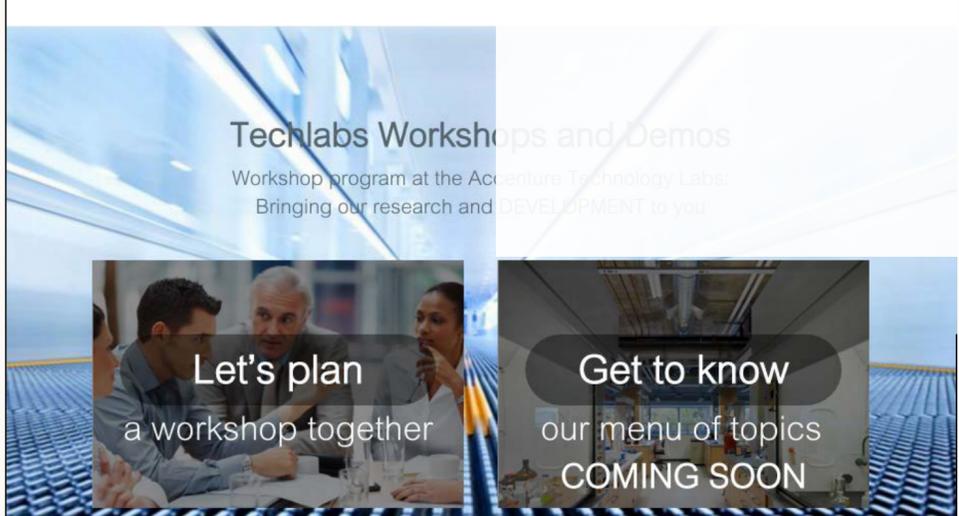
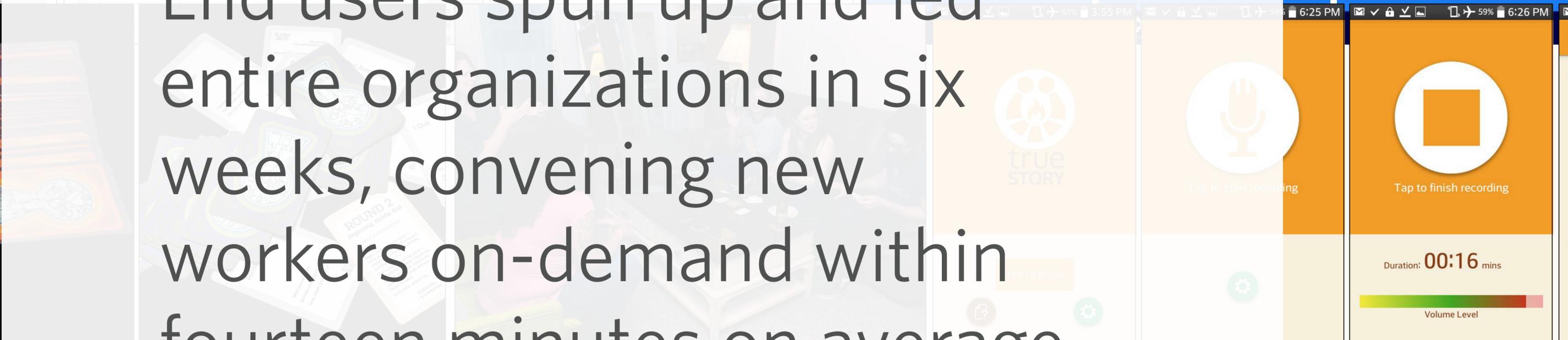
Medical resident

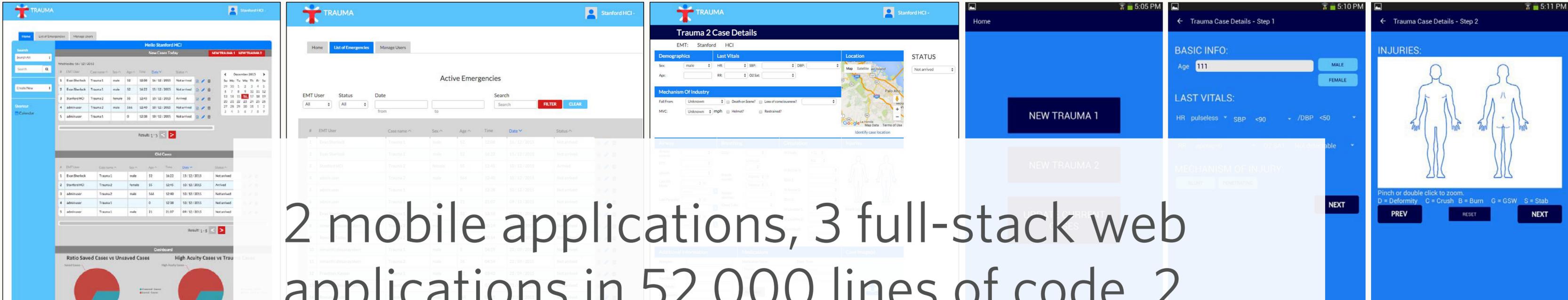
Open-ended goal

Develop prototype application for EMTs to transmit patient information en route to hospital



End users spun up and led entire organizations in six weeks, convening new workers on-demand within fourteen minutes on average.

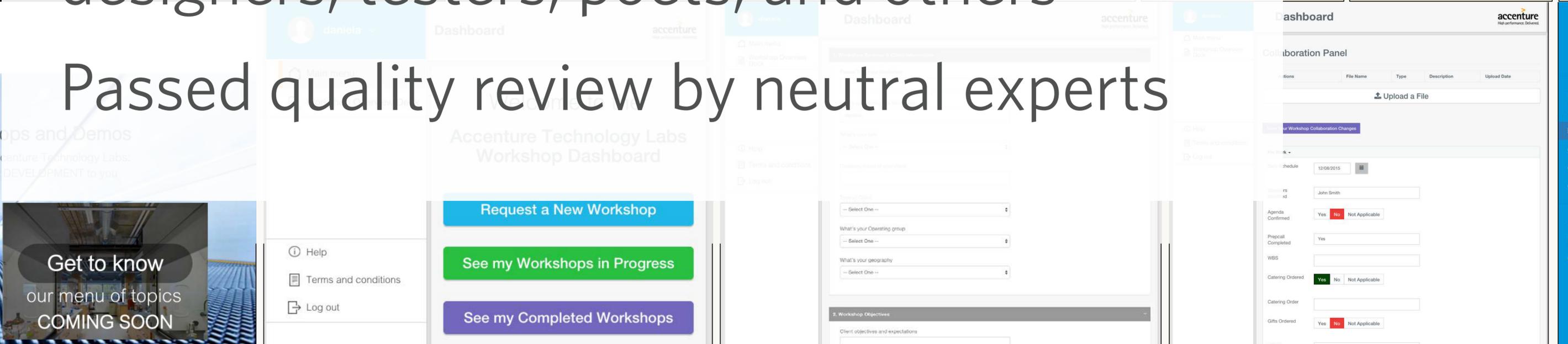




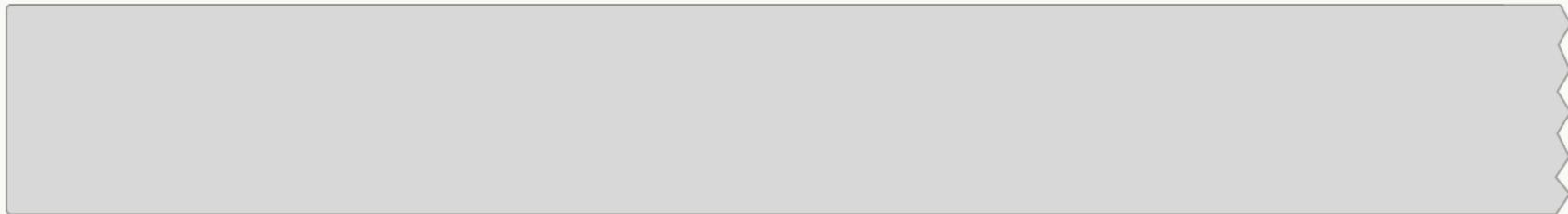
2 mobile applications, 3 full-stack web applications in 52,000 lines of code, 2 illustrated card decks

639 tasks, 3261 person-hours of work across 35-46 days from engineers, designers, testers, poets, and others

Passed quality review by neutral experts



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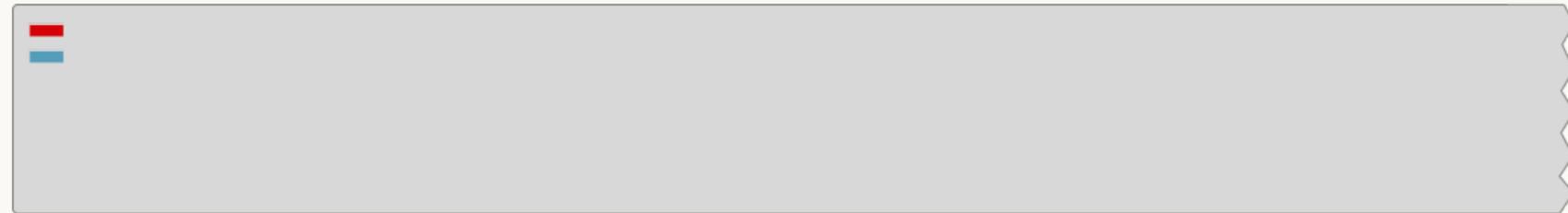
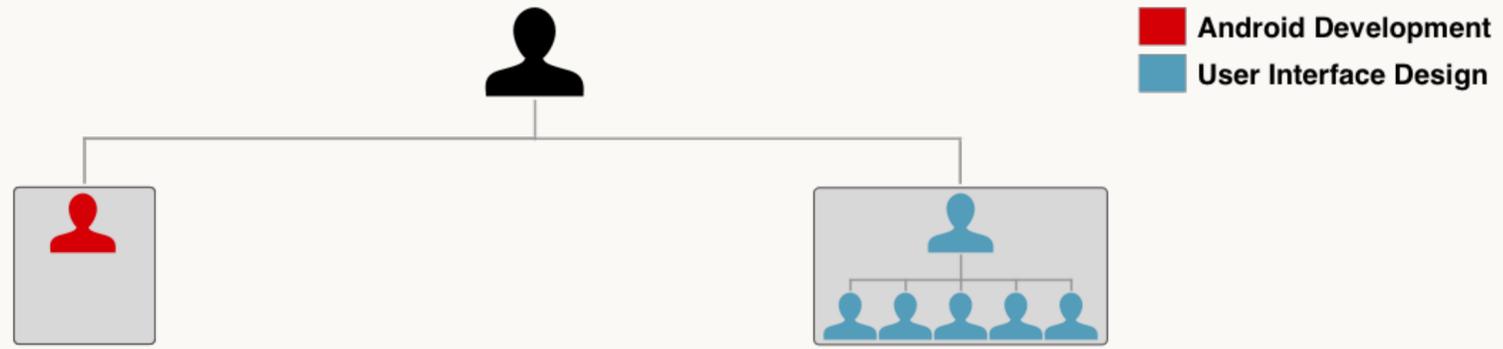


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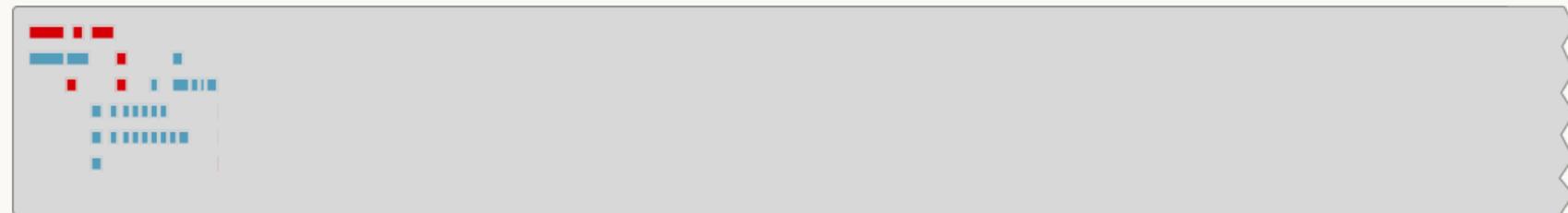
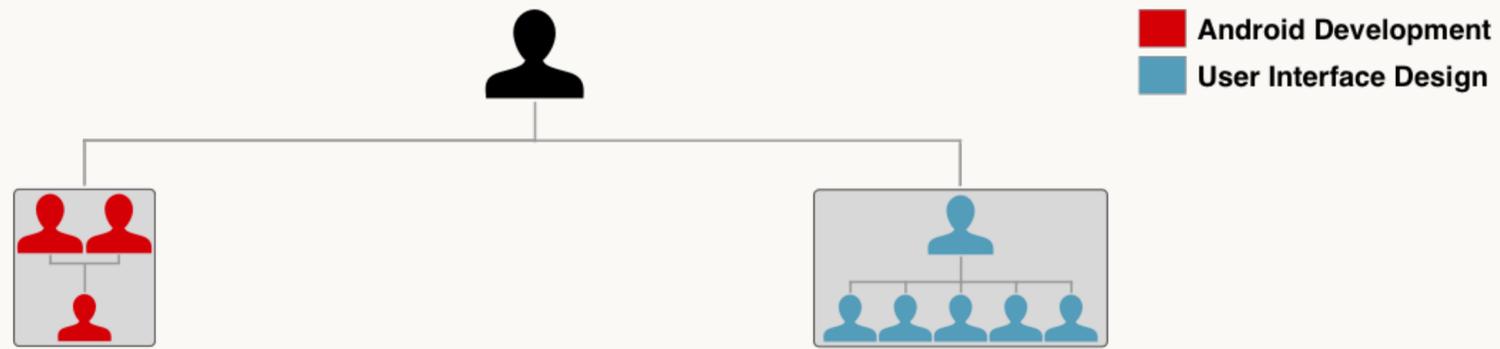
 Android Development



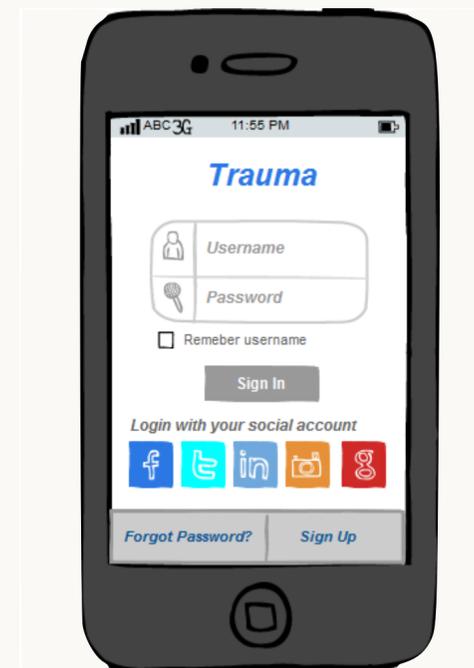
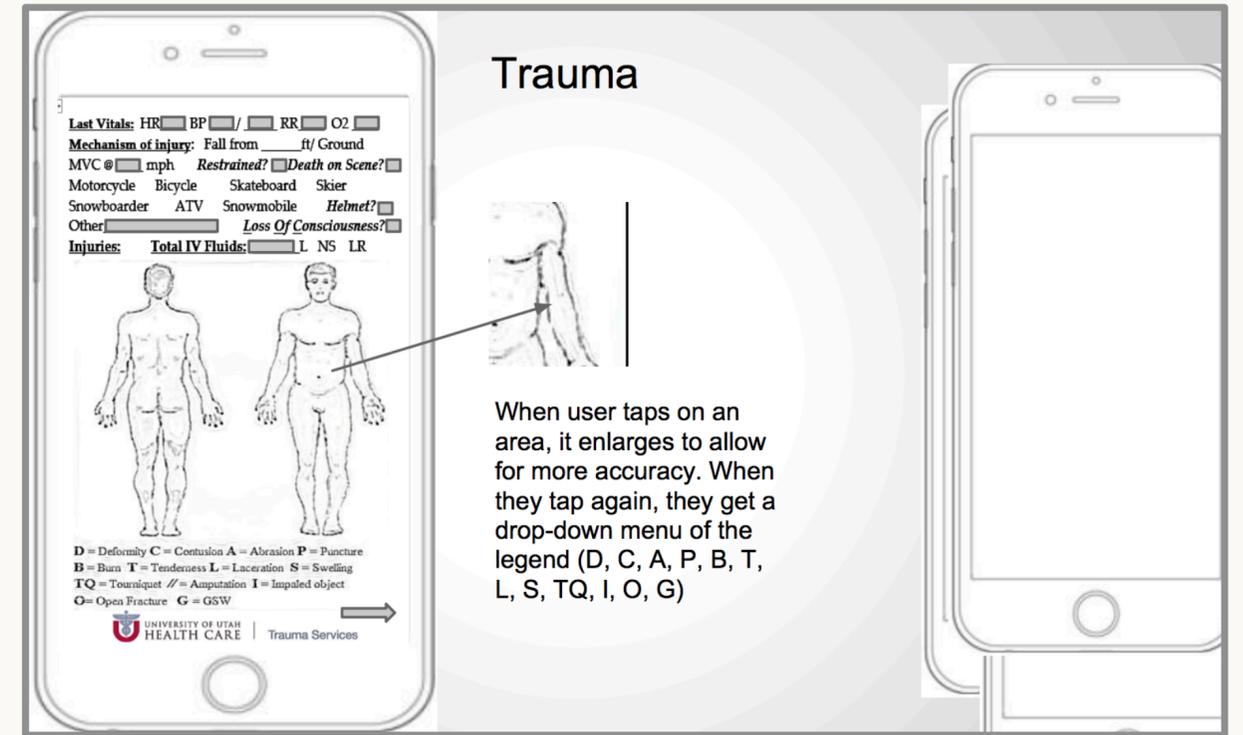
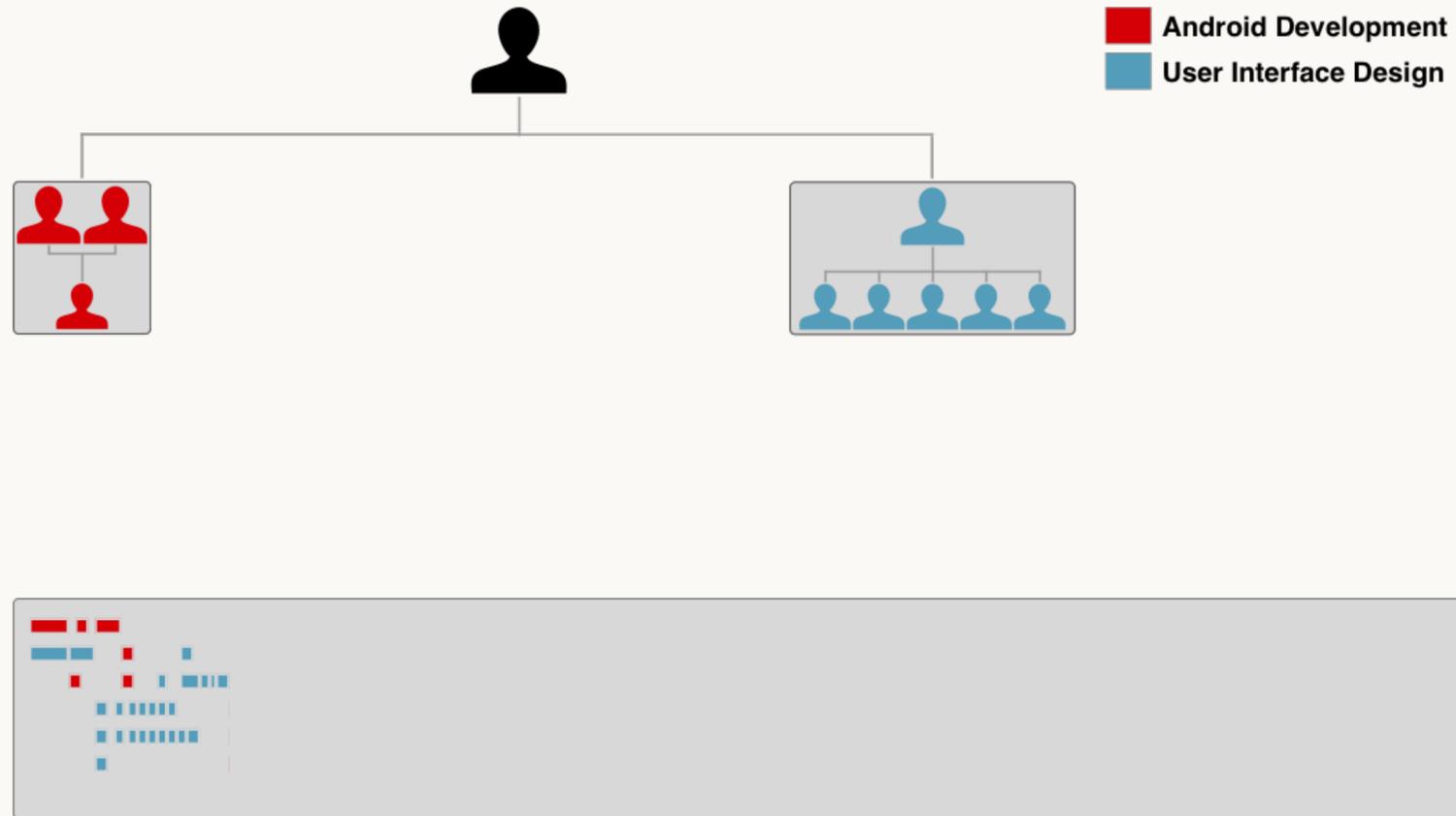
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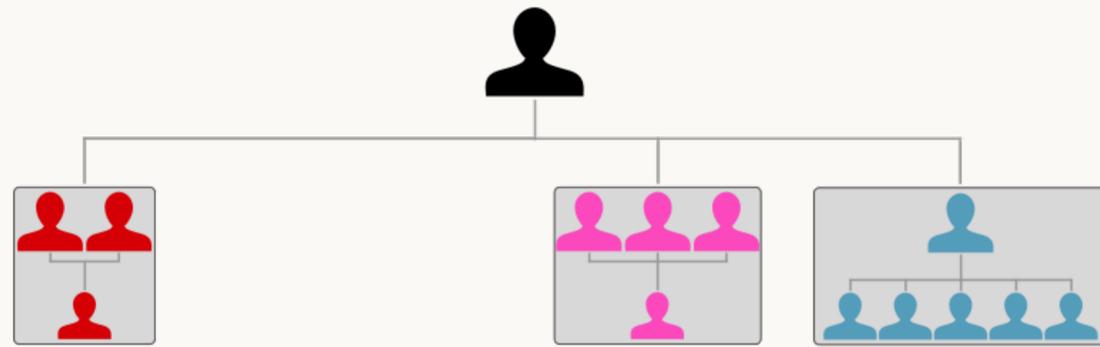
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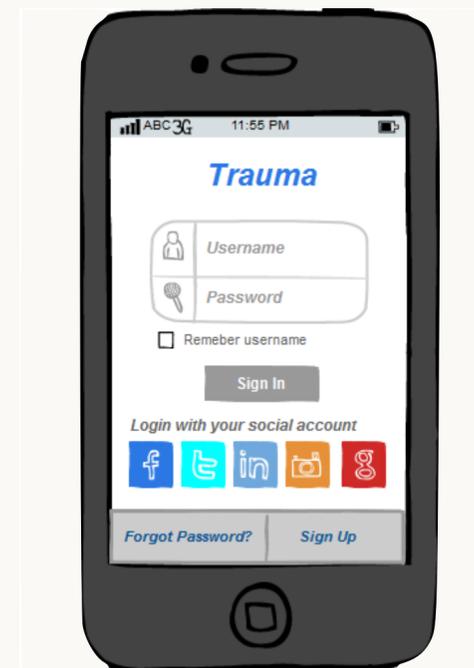
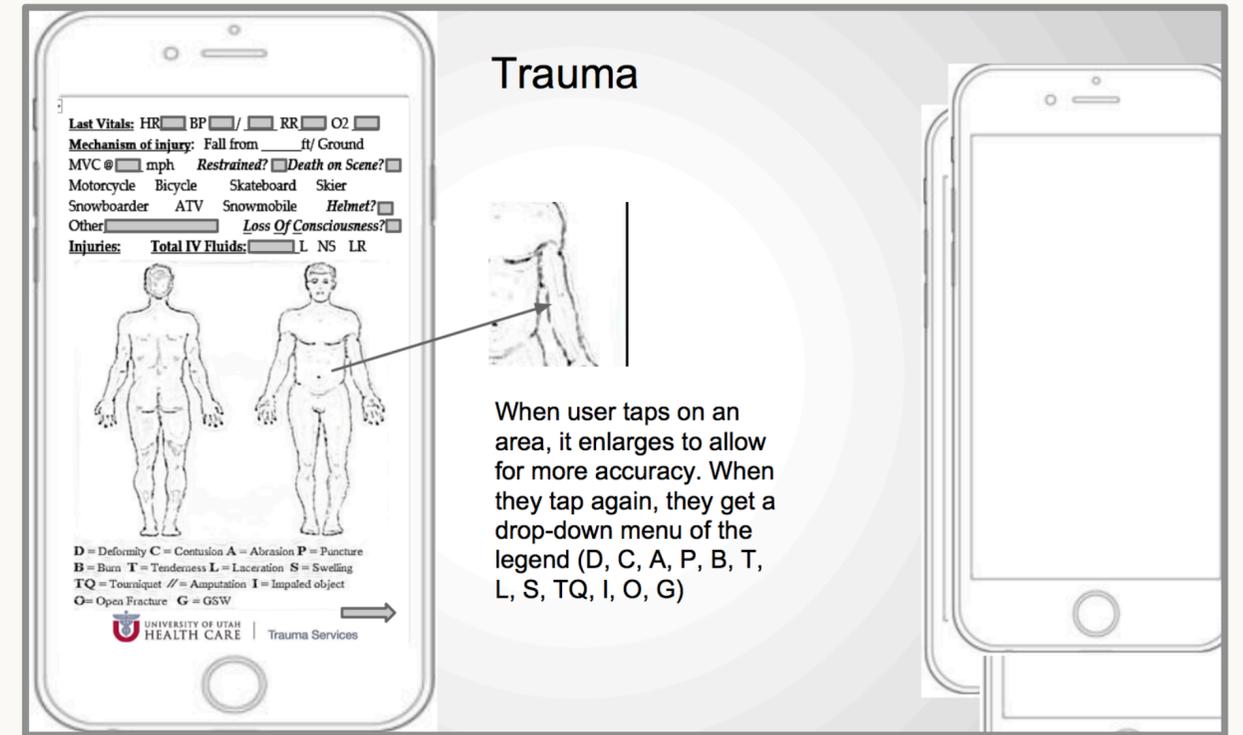
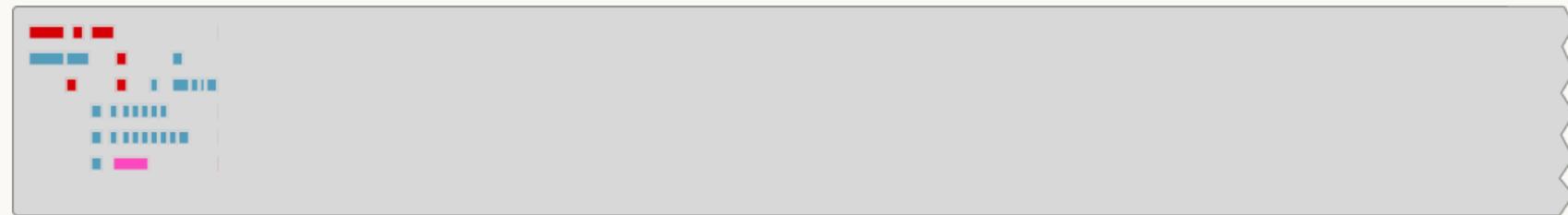
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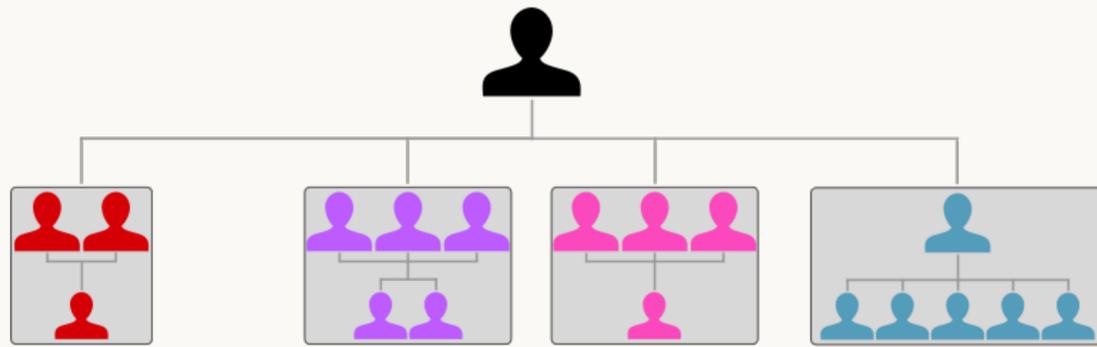
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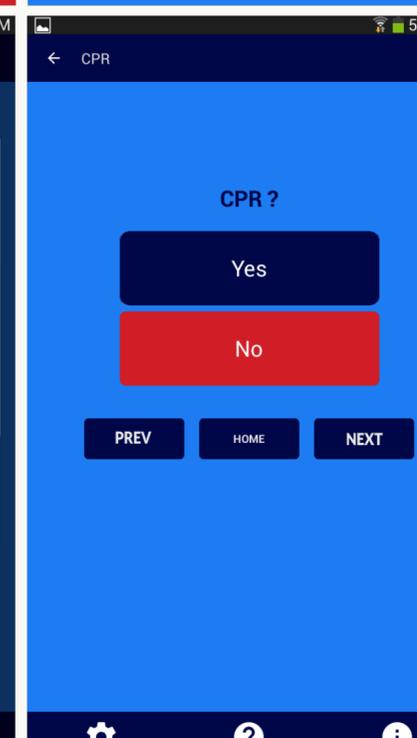
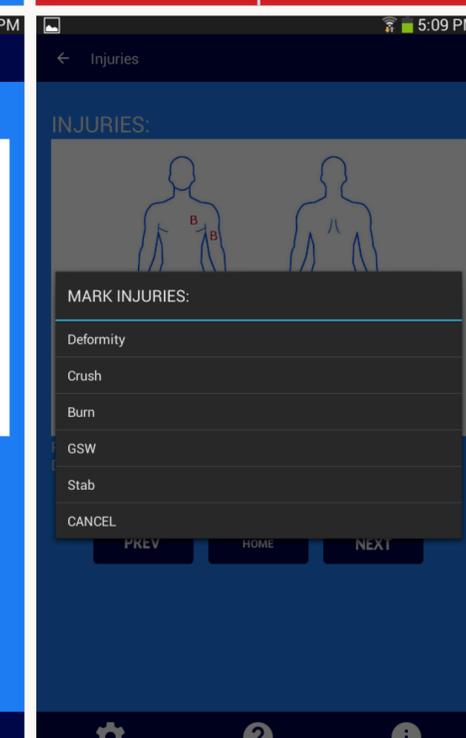
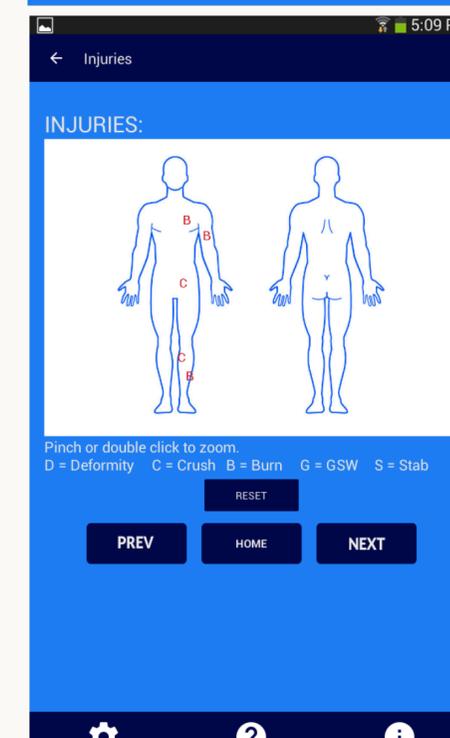
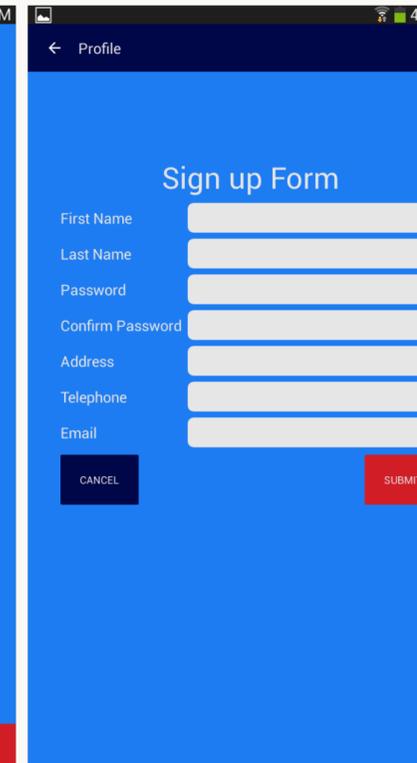
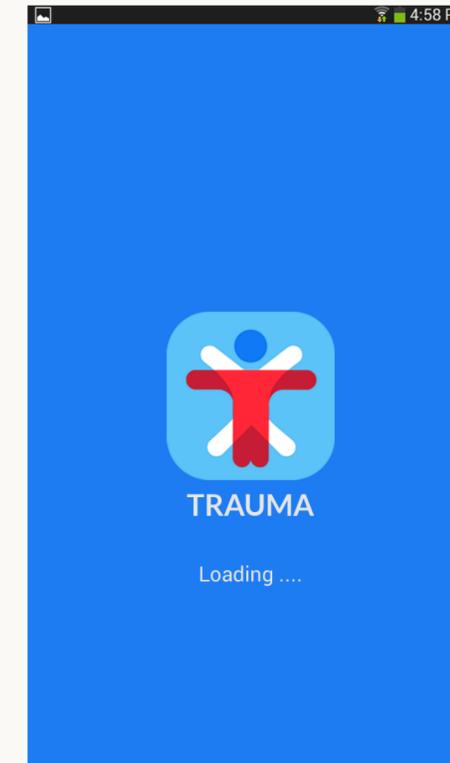
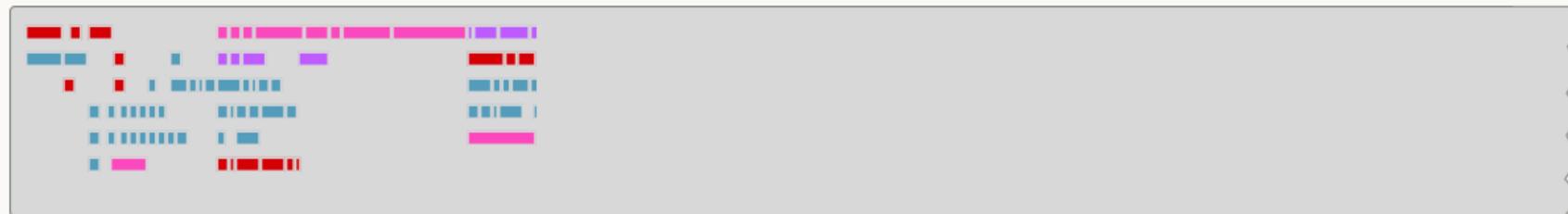
- Android Development
- User Interface Design
- Front End Development



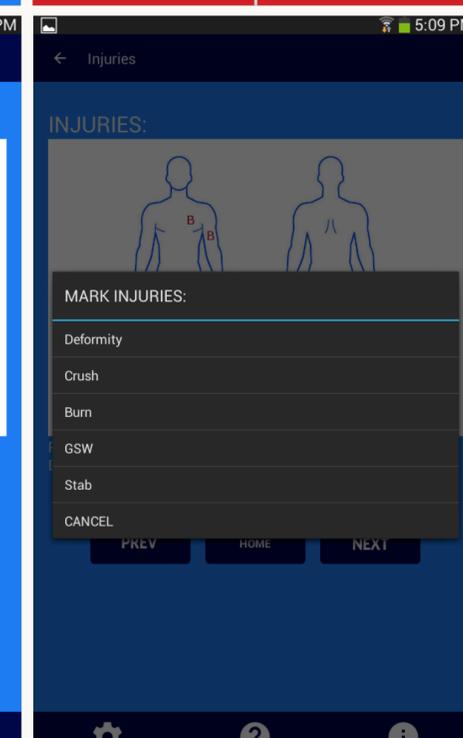
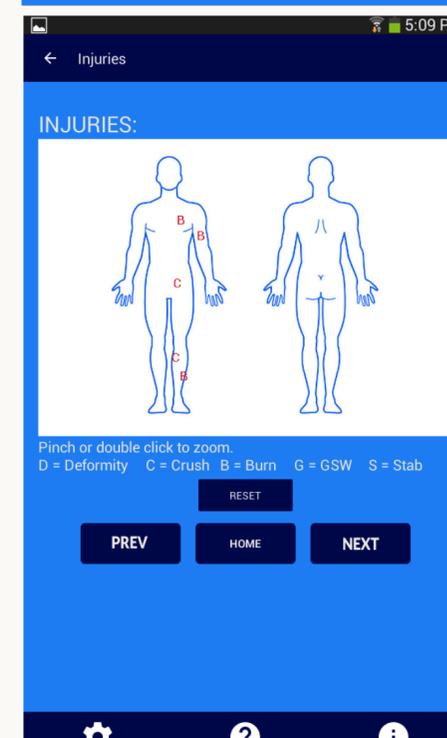
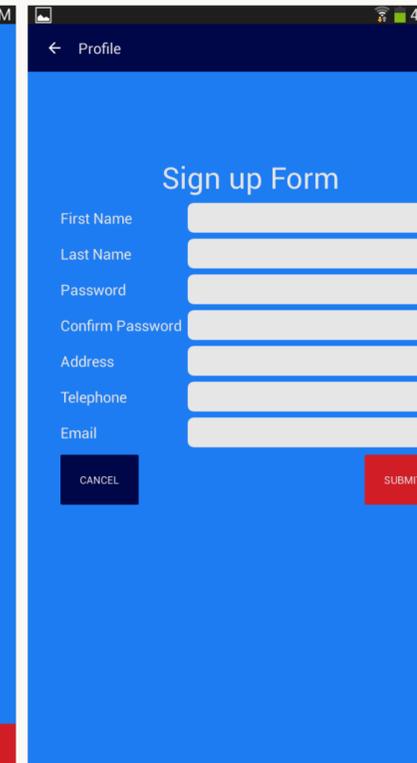
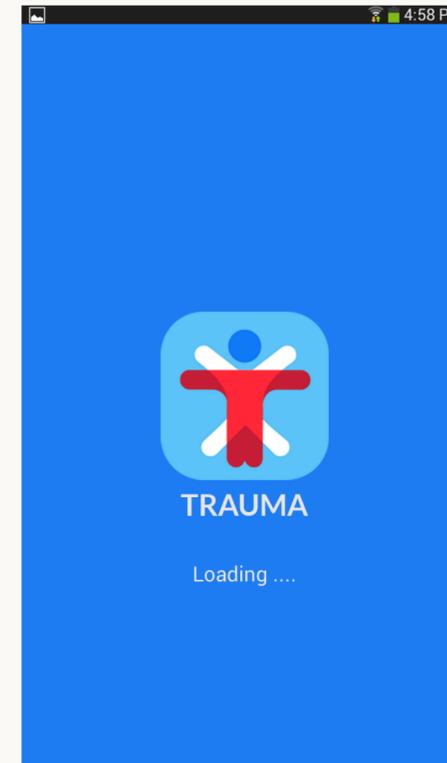
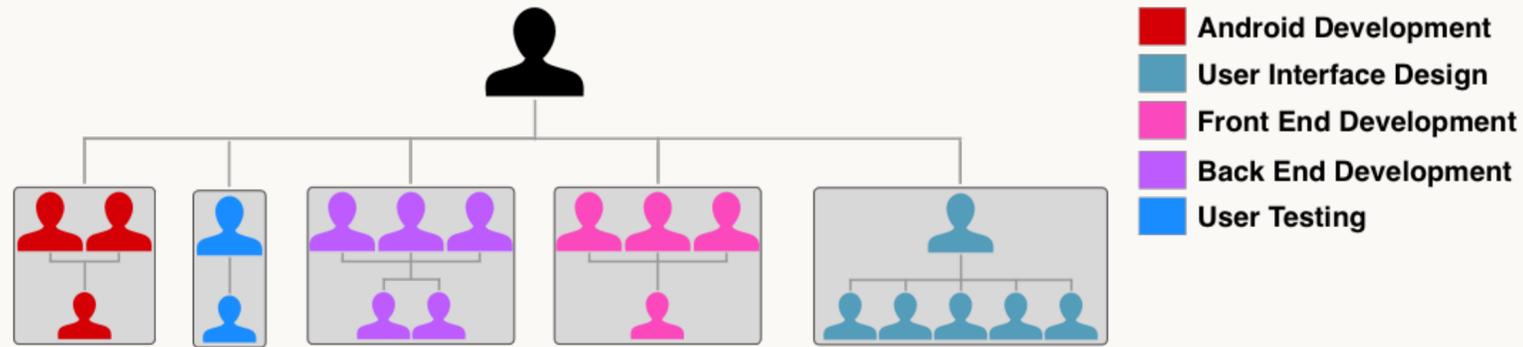
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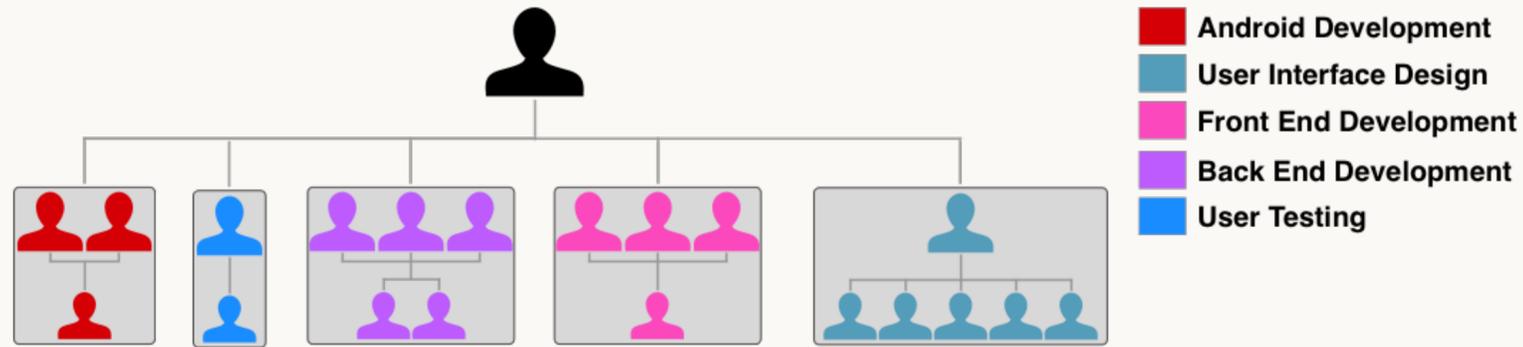
- Android Development
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- Back End Development



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Test Protocols version 1.0

Id	Fields	Allowed Data and Test
1	First Name	Required field cannot be blank. This field should accept
2	Last Name	Blank field validation, should accept the text
3	Password	Blank field validation, minimum 6 characters required. T proper data.
4	Re-Type Password	On miss type password an alert should show the user. O should accept the password.
5	Address	Blank field validation, insert some address to move one
6	Telephone	Only digits are allowed, No characters are allowed
7	Email	Should only get the valid email, patter like email@example.com already exists show some alert.
8	Sign Up	On Sign Up validate fields and process to sign up. If any is missing, it shouldn't take user to the next view.
9	Cancel	On tap cancel it should take user to the back step

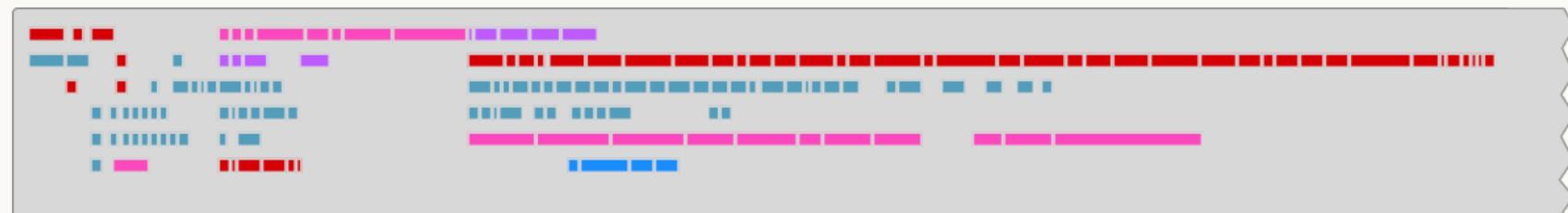
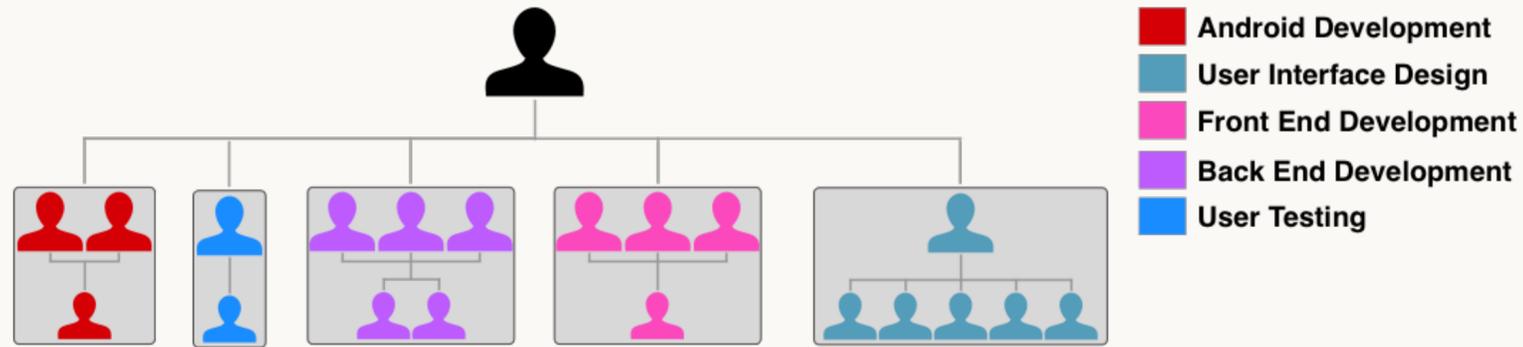
Login

Login screen enables the user to enter their valid information to interact with the ap

User needs to provide the following information in order to use the application. Field follows:

1. Username (A unique name created at the time of sign up)
2. Password (Valid password created at the time of sign up)
3. Remember Me Checkbox (If checked, it stores the user's login information and again when the application is re-launch.)

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TOP-DOWN RECONFIGURATION

Test Protocols version 1.0

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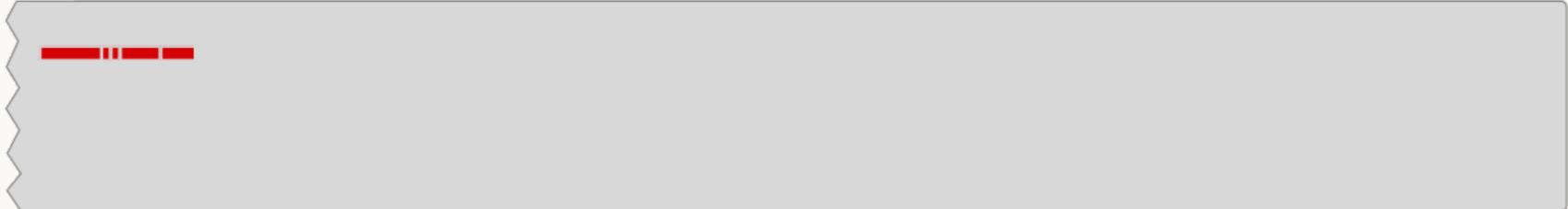
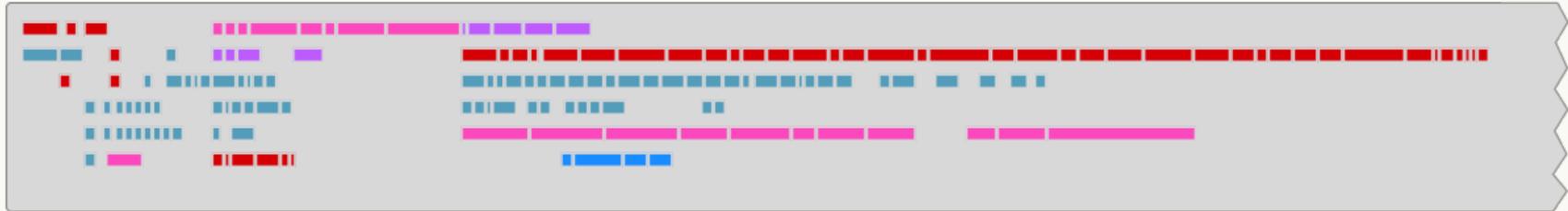
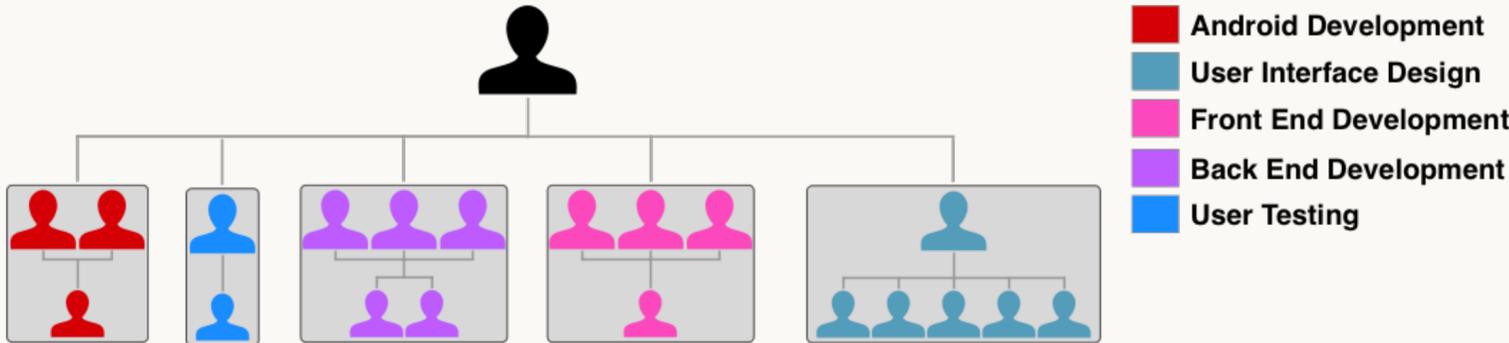
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TOP-DOWN RECONFIGURATION

 **TRAUMA**

New High Acuity Case

Basic Information

Name:

Sex:

Time:

Date:

Age:

Area:

Injuries



Mechanics of Injury

Mechanism:

Intubated:

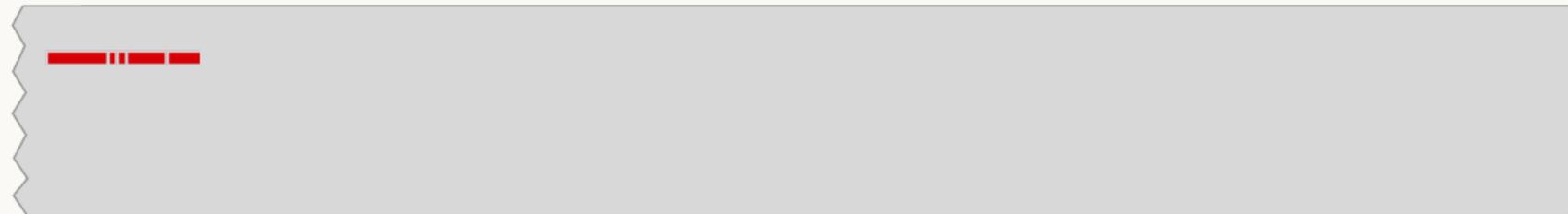
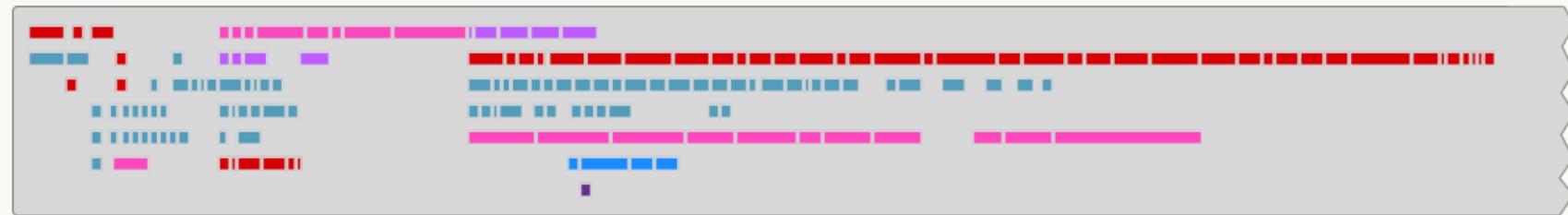
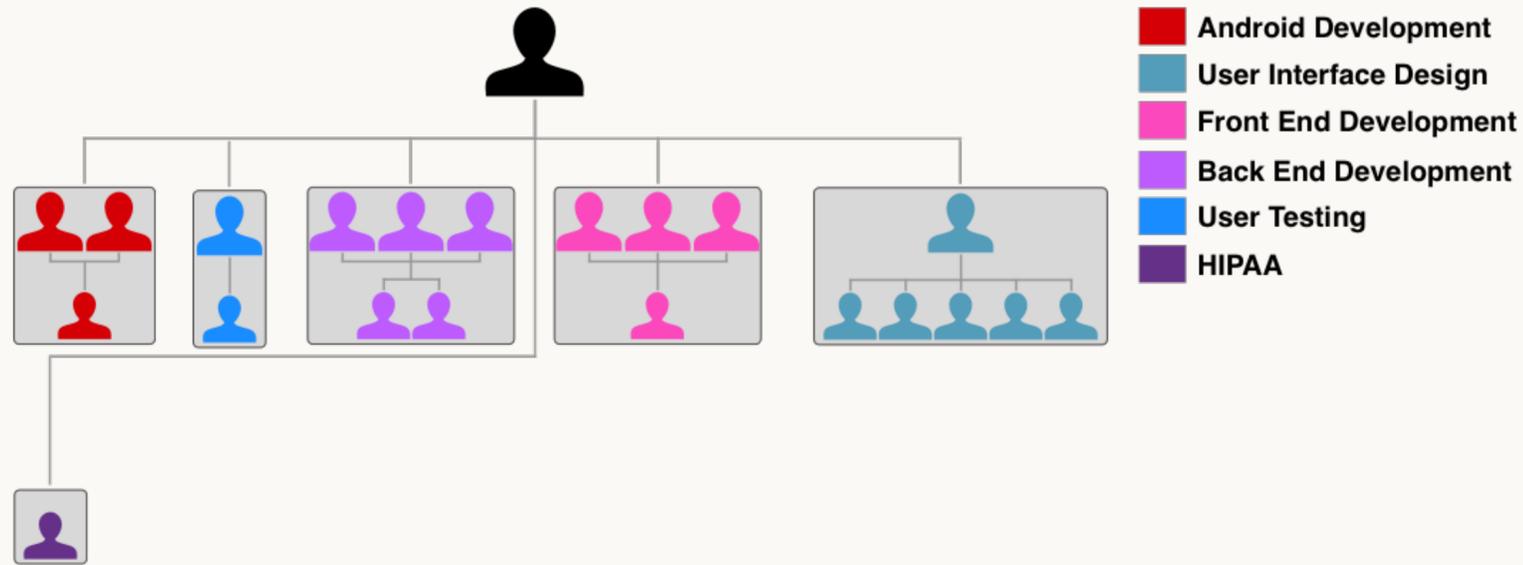
Respiratory Rate:

Heart Rate:

Systolic Blood Pressure:

- Type of Injury:
- D = Deformity
 - C = Contusion
 - A = Abrasion
 - P = Puncture
 - B = Burn
 - T = Tender
 - L = Laceration
 - S = Swelling
 - TQ = Tourniquet
 - I = Impaled
 - Q = Open Fracture
 - G = Gunshot Wound
 - // = Amputation

EMS TRAUMA REPORT



- Android Development
- User Interface Design
- Front End Development
- Back End Development
- User Testing
- HIPAA



New High Acuity Case

Basic Information

Name:

Sex: ▼

Time:

Date: 📅

Age:

Area:

Injuries



Type of Injury:

- D = Deformity
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- TQ = Tourniquet
- I = Impaled
- Q = Open Fracture
- G = Gunshot Wound
- // = Amputation

Mechanics of Injury

Mechanism: ▼

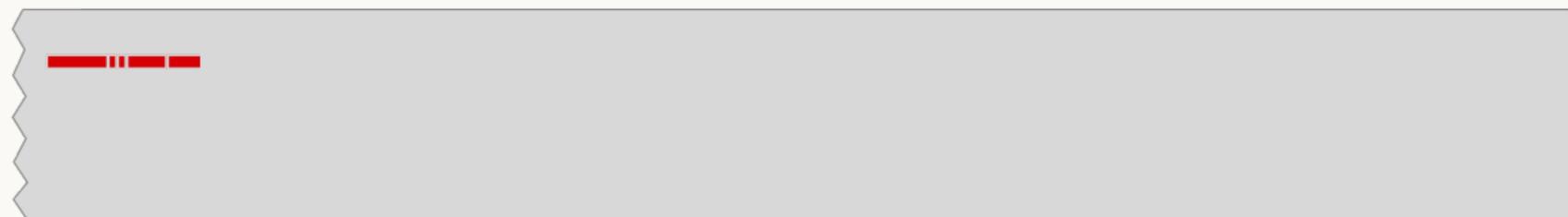
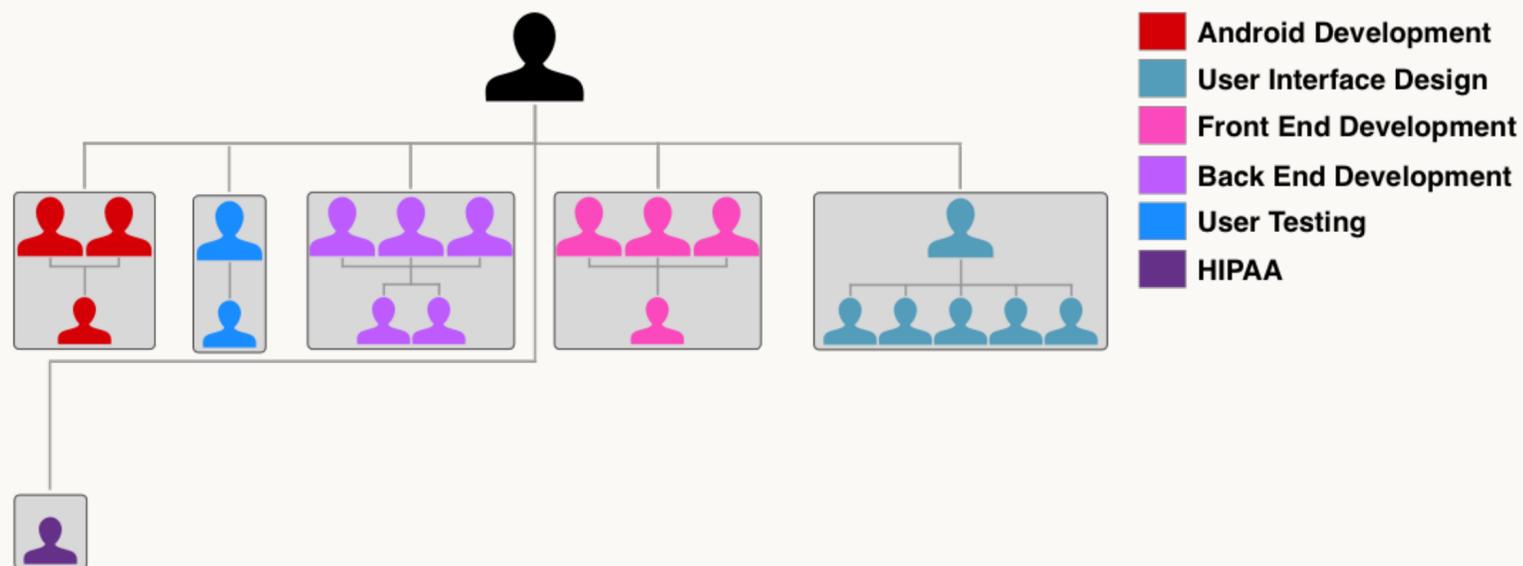
Intubated: ▼

Respiratory Rate: ▼

Heart Rate: ▼

Systolic Blood Pressure: ▼

EMS TRAUMA REPORT



How do I become HIPAA compliant? (a check

By Jason Wang / Published on October 30, 2013

A little housekeeping before we answer the question. This article is not a definitive list of what is required. You should assign a Privacy Officer to review each rule in its entirety. This article is intended to point you in the right direction.

So you have determined that you are handling protected health information (PHI) and that you need to become HIPAA compliant. What steps need to be taken in order to become HIPAA compliant?

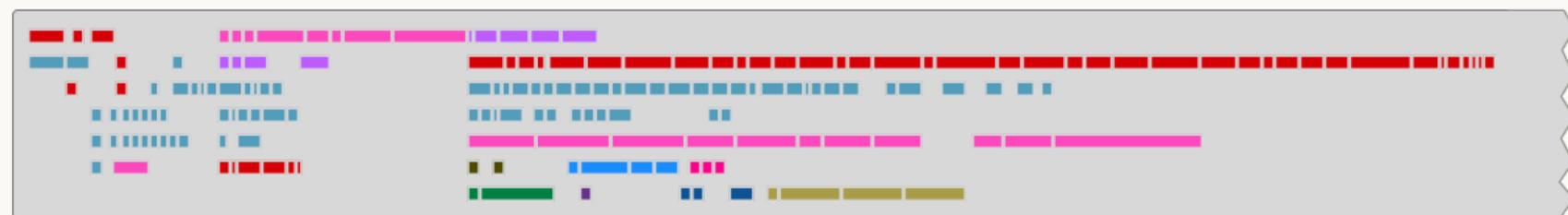
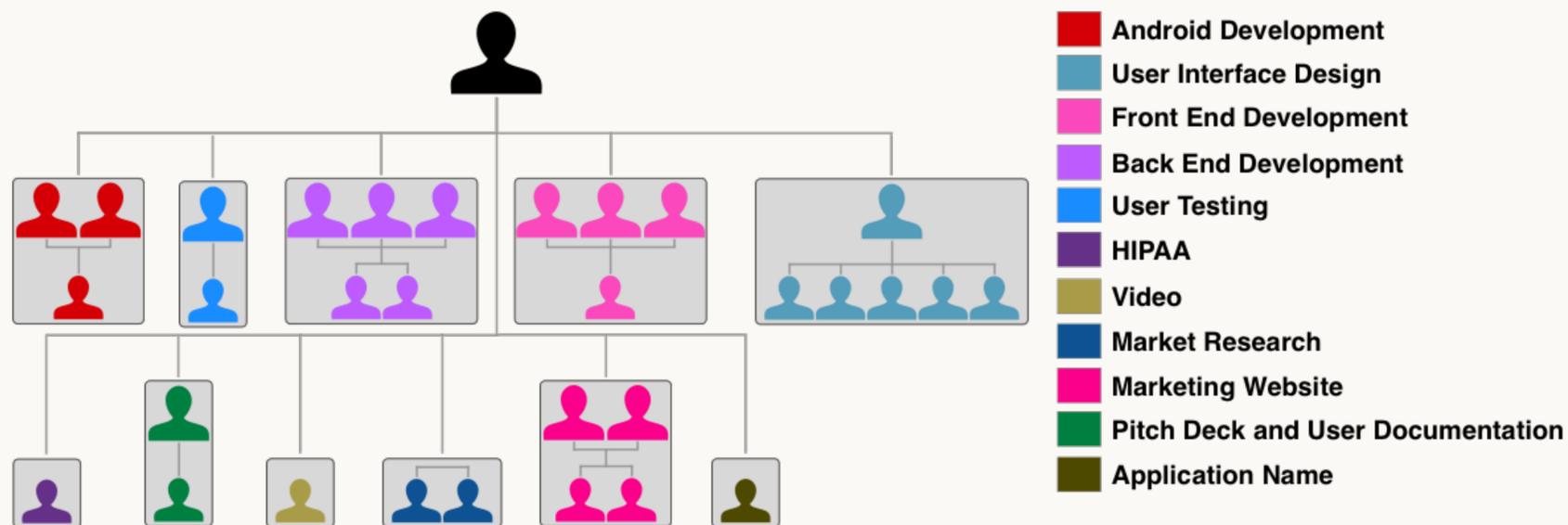
HIPAA for trauma app

File Edit View Insert Format Tools Table Add-ons Help Last edit was made on Sep

100% Normal text Arial 11 B I U A

- 1) Written regulation to accept fully identified persons only first and last name
 - a) ELABORATION: All users manually approved by an admin before they can log in or do anything
- 2) Authentication
 - a) RESPONSE: We have an auth system, API requests are authenticated using HTTP Basic (which will be over HTTPS in production), and then we have three levels admin (rw on everything) doctor (rw on emergency cases) and user (rw on their own emergency cases while active, then ro)
 - b)
- 3) Logging
 - a) RESPONSE: This is something we need to add. I'll be using a logging framework (probably <https://github.com/trentm/node-bunyan>) to log to stdout, and it can be piped into files or whatever in production

EMS TRAUMA REPORT



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By Jason Wang / Published on October 30, 2013

A little housekeeping before we answer the question. This article is not a definitive list of what is required. You should assign a Privacy Officer to review each rule in its entirety. This article is intended to point you in the right direction.

So you have determined that you are handling protected health information (PHI) and that you need to become HIPAA compliant. What steps need to be taken in order to become HIPAA compliant?

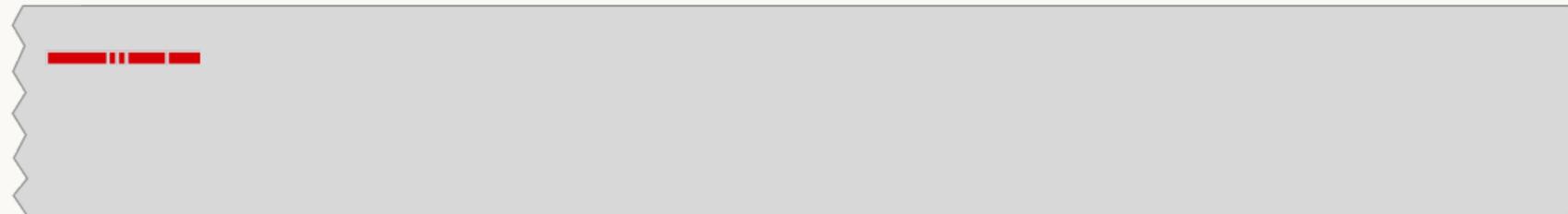
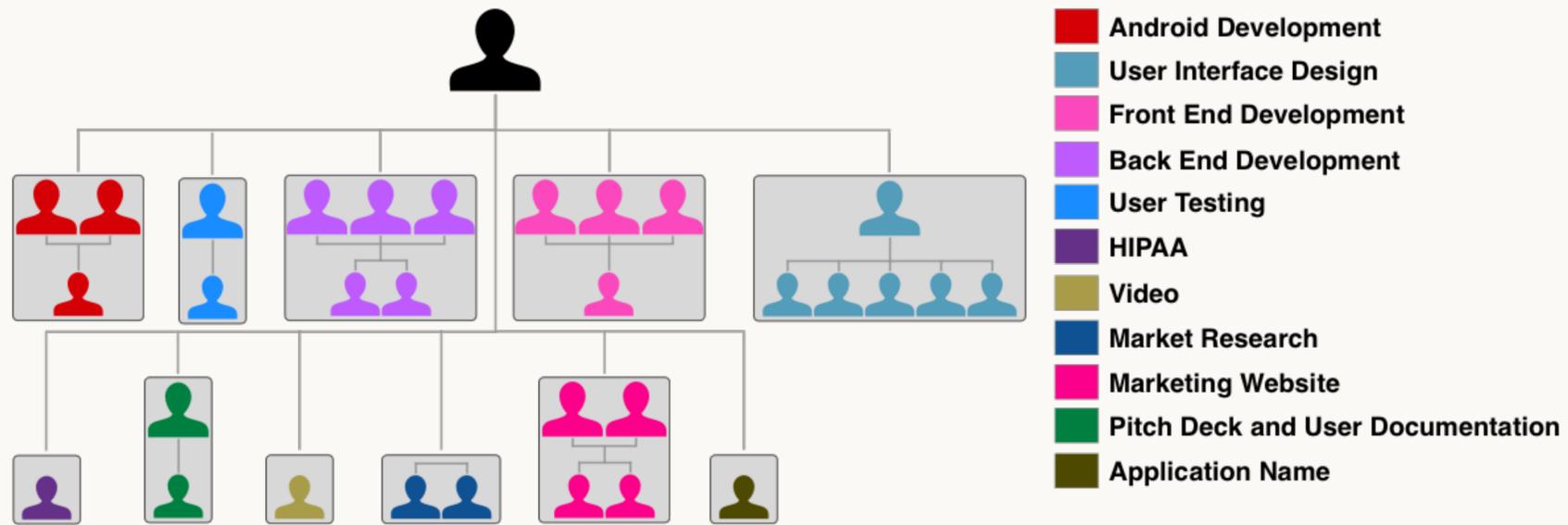
HIPAA for trauma app

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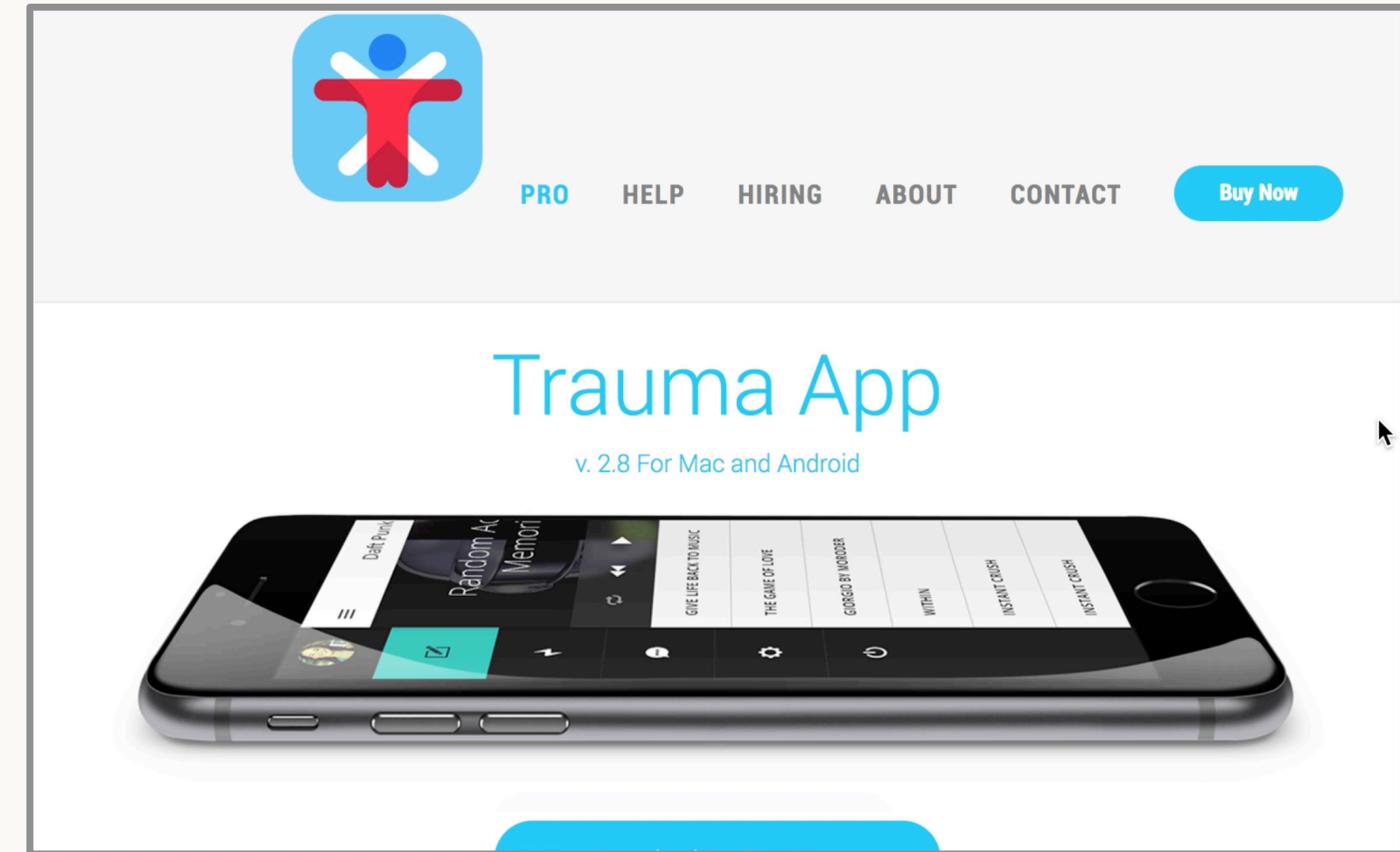
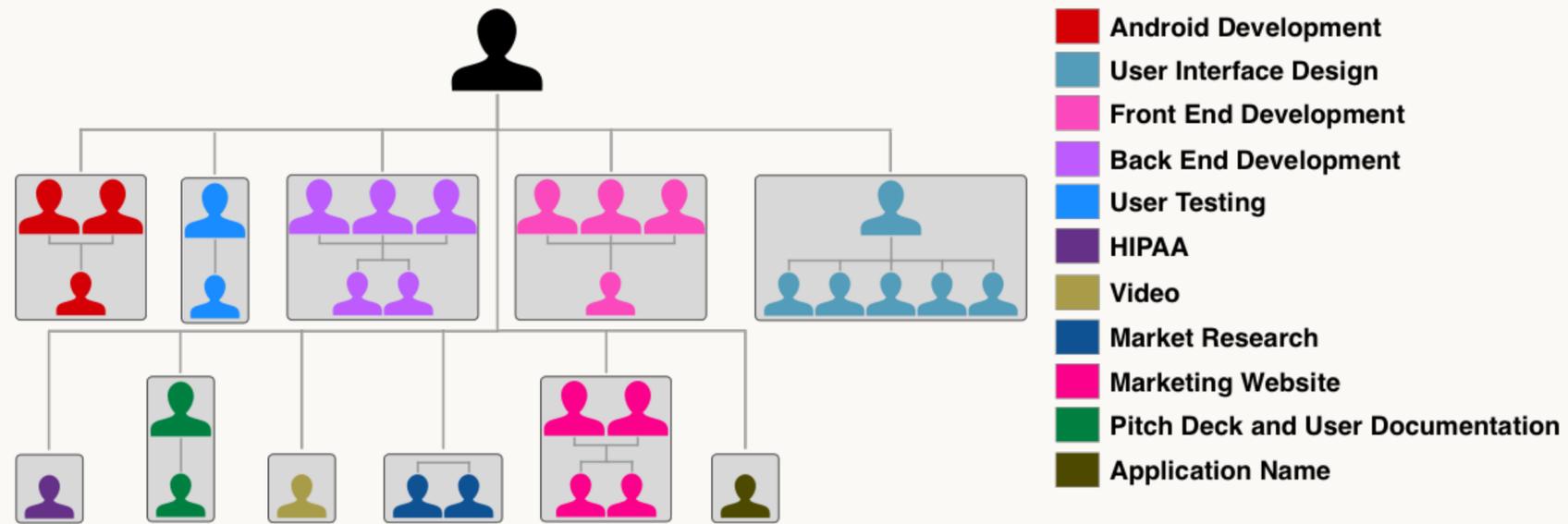
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- 1) Written regulation to accept fully identified persons only first and last name
 - a) ELABORATION: All users manually approved by an admin before they can log in or do anything
- 2) Authentication
 - a) RESPONSE: We have an auth system, API requests are authenticated using HTTP Basic (which will be over HTTPS in production), and then we have three levels admin (rw on everything) doctor (rw on emergency cases) and patient (rw on own emergency cases while active, then ro)
 - b)
- 3) Logging
 - a) RESPONSE: This is something we need to add. I'll be using a logging framework (probably <https://github.com/trentm/node-bunyan>) to log to stdout, and it can be piped into files or whatever in production

EMS TRAUMA REPORT

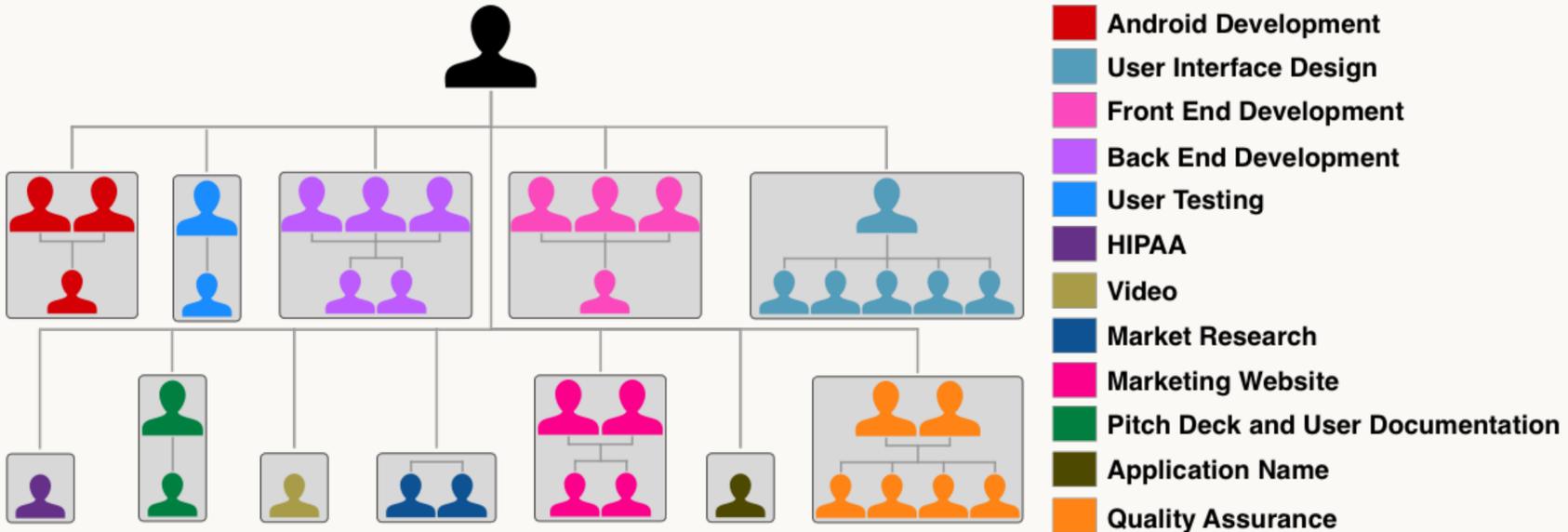


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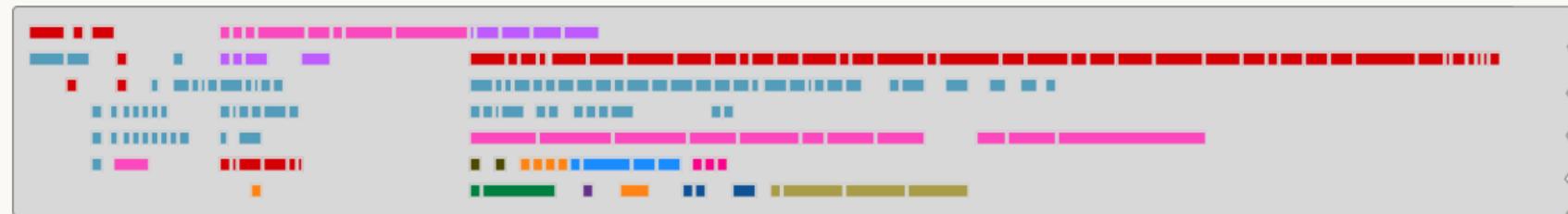
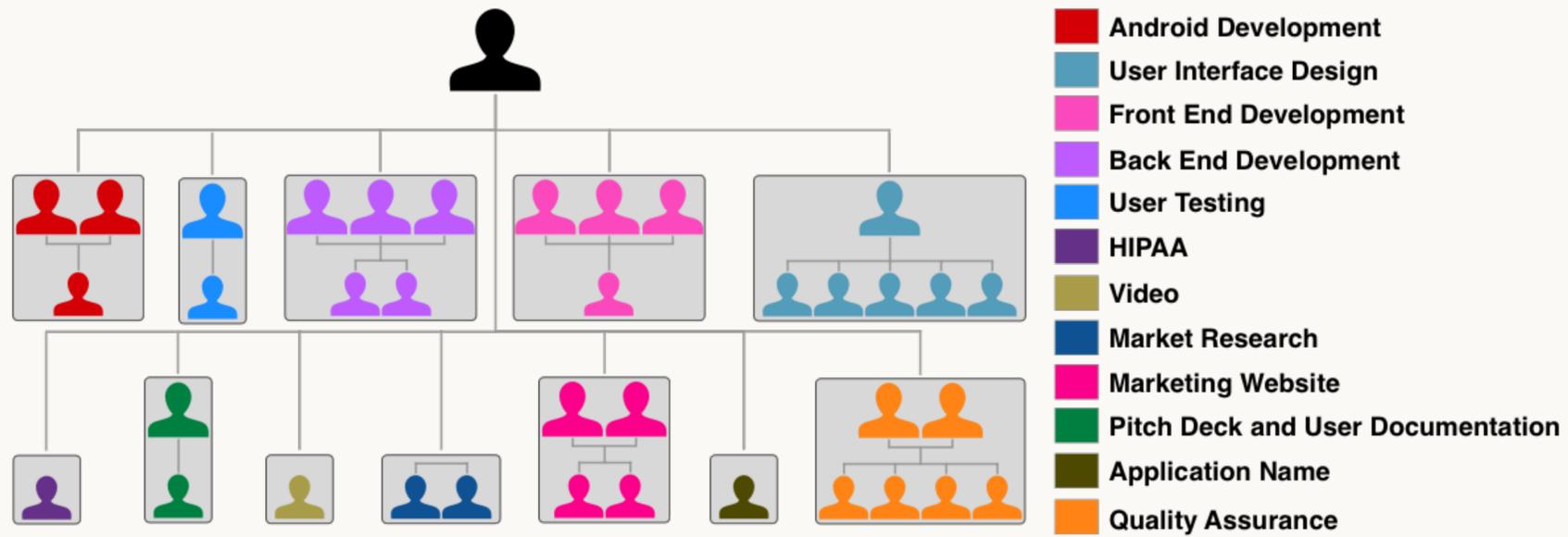


BOTTOM-UP RECONFIGURATION

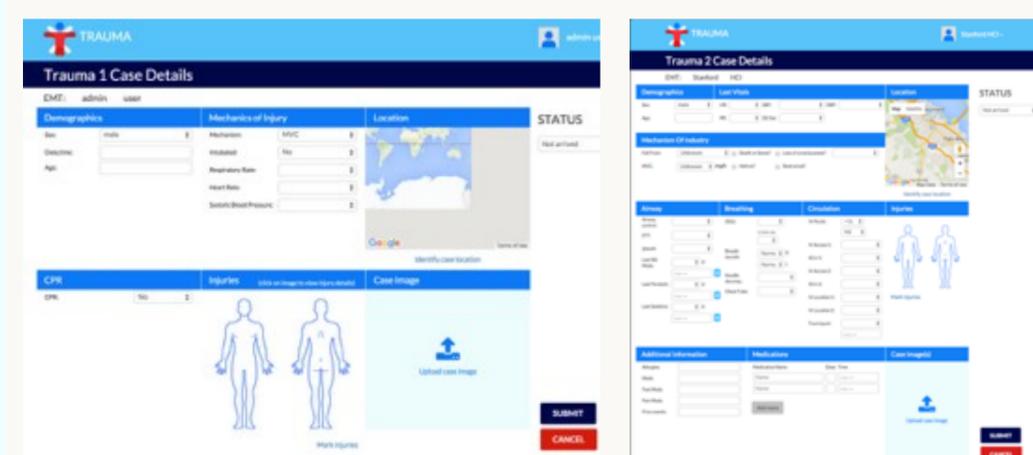
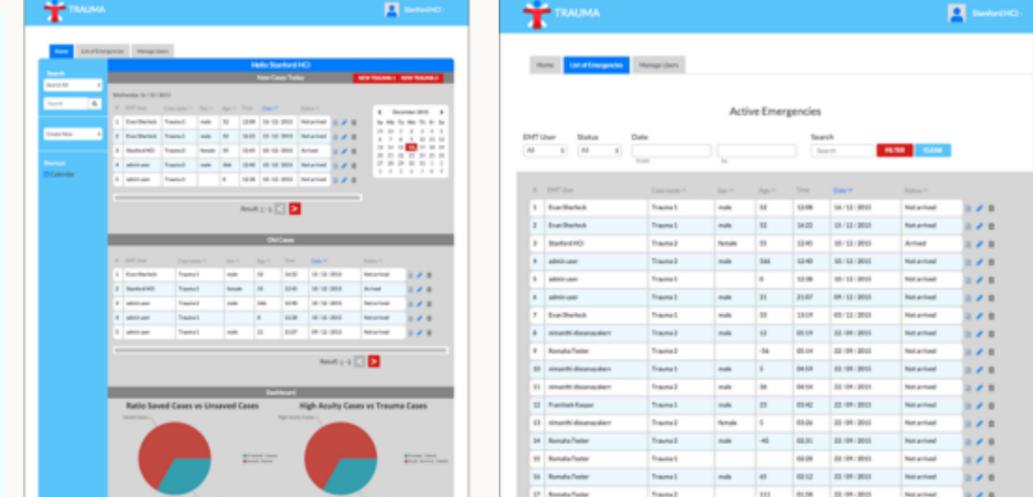
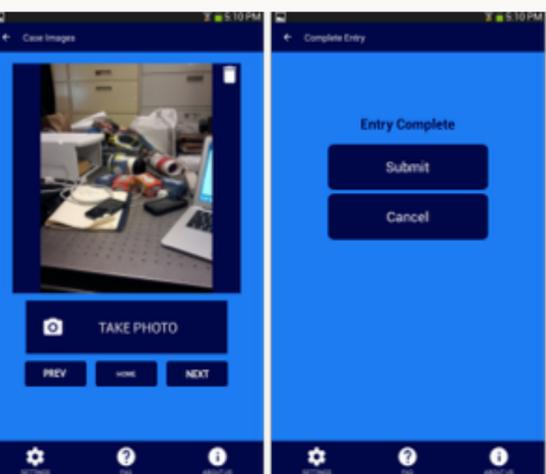
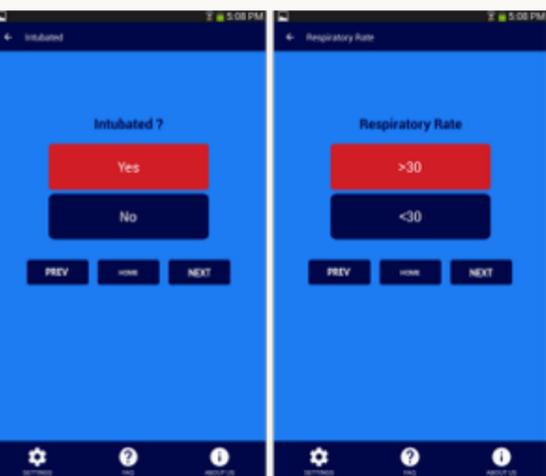
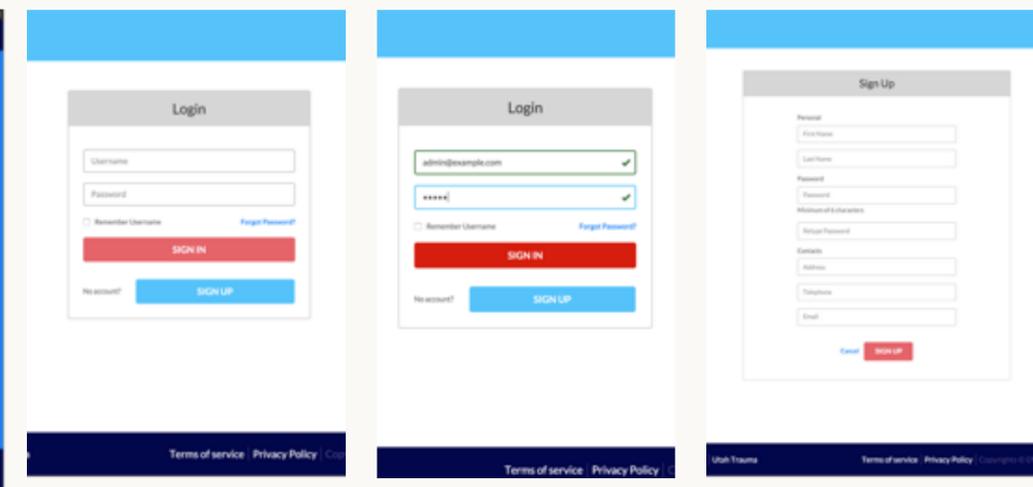
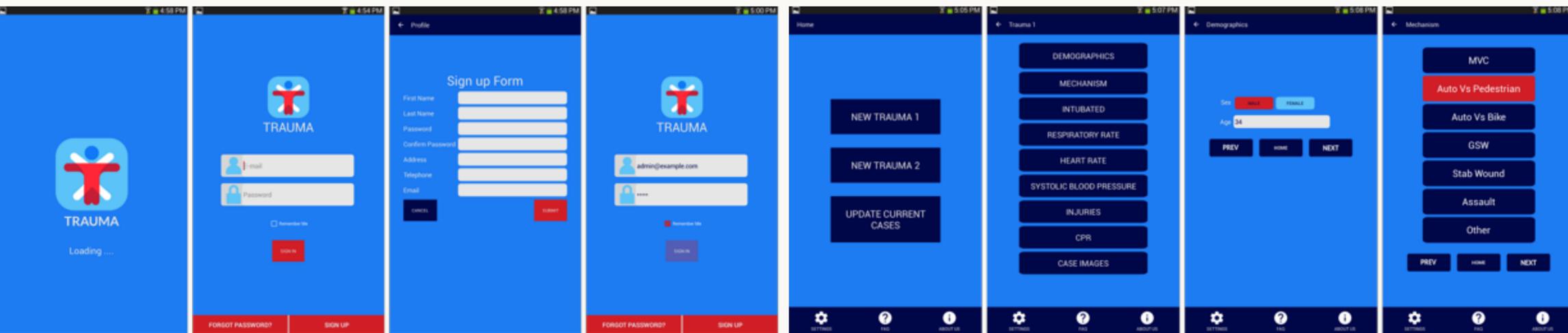
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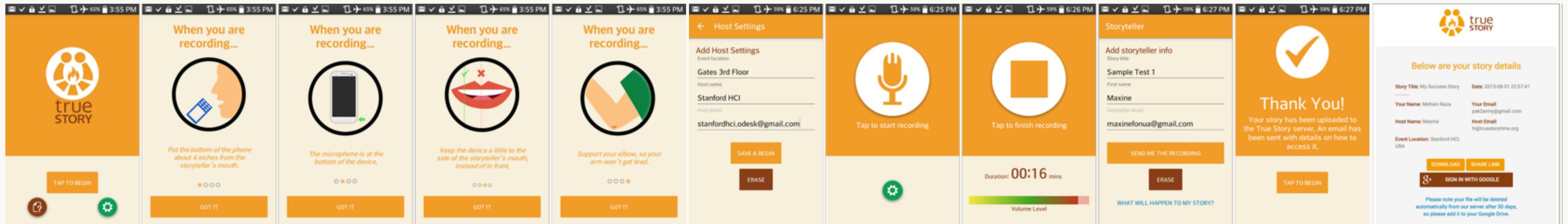
TRUE STORY GAME



CRUSHING

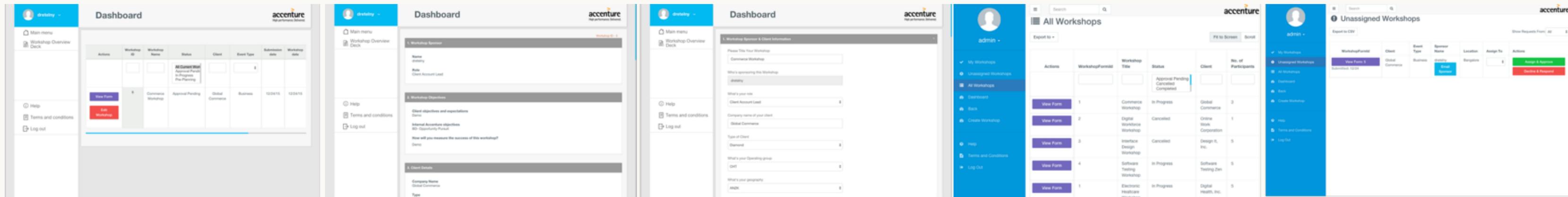
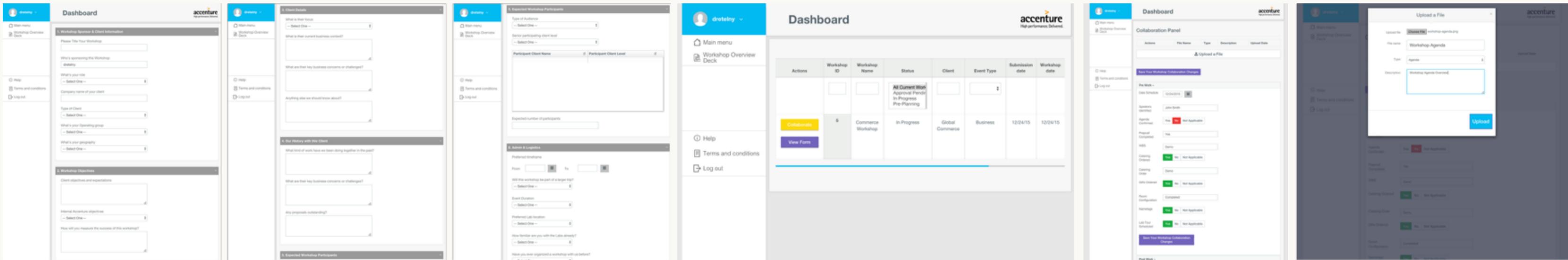
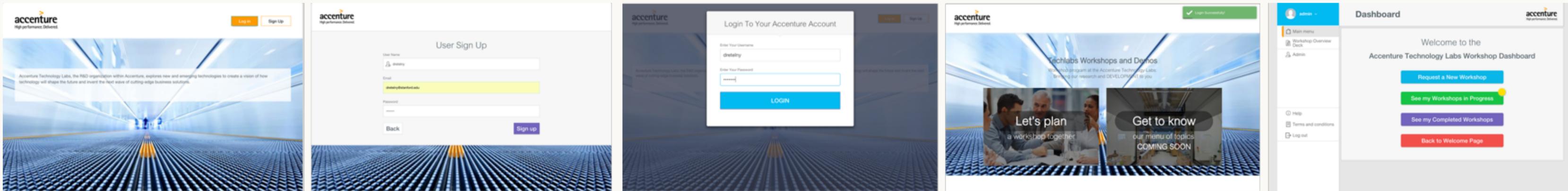
Subtle looks, pounding pulse
However long the hover lasts
Between friend zone and fun zone

TRUE STORY GAME



Android companion app spun up in the final week

ENTERPRISE WORKSHOP PORTAL



ROLE HIRES IN <14 MINUTES

	EMS Report	True Story	Enterprise Portal	All Projects
Median time (mm:ss)	13:40	12:40	15:13	13:40

20 manual hires in a median 889 minutes (~15 hours)

RECONFIGURED ORG STRUCTURES

	EMS Report	True Story	Enterprise Portal	All Projects
# of pull requests	335	113	118	566
Mean pull requests per day	7.3	2.8	3.4	4.5

DISCUSSION

How might we use data and experimentation to develop effective organizational structures and practices?

Do flash organizations change the transaction costs core to the Theory of the Firm?

Flash organizations offer a future where organizations are fluidly assembled and re-assembled from globally networked labor markets.

Flash Organizations

Thanks to...

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Amazing questions