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 | Peer production
DOMINANT ARCHITECTURE: ALGORITHMS

Pre-define all possible behaviors into software

Modularize and pre-specify all actions, allowing computation to decide which behaviors are taken, when, and by whom; optimize, error-check, and combine submissions

[Kittur 2011]

[Little 2010]
CHALLENGE: OPEN-ENDED AND COMPLEX GOALS

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

[Lasecki 2013] [Retelny 2014] [Yu, Kittur and Kraut 2014]
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
“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]
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.
FOUNDARY

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

Hiring queue

Task Available

Congratulations! You are at No. 1 position in the hiring queue. However, to reinforce again, this position is only available for 10 minutes.

As stated in the job description, you will have 3 hours and 45 minutes to work on this task.

Project overview: Create a "Question & Answer Web Application" project.

Please read the following information carefully.

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

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.

Automated, role-specific onboarding
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?
To enable reconfiguration of the organizational structures: **branching and merging** inspired by version control.
Any member can branch, edit, and issue pull requests against any organizational structure: roles, teams, hierarchy, tasks.

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
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
EMS TRAUMA REPORT
EMS TRAUMA REPORT

android development
user interface design

[Diagram of a hierarchical structure with labels for Android Development and User Interface Design]
EMS TRAUMA REPORT
EMS TRAUMA REPORT

Android Development
User Interface Design

Trauma

When user taps on an area, it enlarges to allow for more accuracy. When they tap again, they get a drop-down menu of the legend (D, C, A, P, B, T, L, S, TQ, I, O, G).
EMS TRAUMA REPORT

Android Development
User Interface Design
Front End Development

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EMS TRAUMA REPORT
EMS TRAUMA REPORT

- Android Development
- User Interface Design
- Front End Development
- Back End Development
- User Testing
EMS TRAUMA REPORT

TOP-DOWN RECONFIGURATION

Test Protocols version 1.0

<table>
<thead>
<tr>
<th>Id</th>
<th>Fields</th>
<th>Allowed Data and Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>First Name</td>
<td>Required field cannot be blank. This field should accept the text.</td>
</tr>
<tr>
<td>2</td>
<td>Last Name</td>
<td>Blank field validation, should accept the text.</td>
</tr>
<tr>
<td>3</td>
<td>Password</td>
<td>Blank field validation, minimum 6 characters required. Too short data.</td>
</tr>
<tr>
<td>4</td>
<td>Re-Type Password</td>
<td>On miss type password an alert should show the user. Qn should accept the password.</td>
</tr>
<tr>
<td>5</td>
<td>Address</td>
<td>Blank field validation, insert some address to move one.</td>
</tr>
<tr>
<td>6</td>
<td>Telephone</td>
<td>Only digits are allowed, No characters are allowed.</td>
</tr>
<tr>
<td>7</td>
<td>Email</td>
<td>Should only get the valid email, patten like <a href="mailto:email@examle.com">email@examle.com</a> already exists show some alert.</td>
</tr>
<tr>
<td>8</td>
<td>Sign Up</td>
<td>On Sign Up validate fields and process to sign up. If any required field is missing, it shouldn't take user to the next view.</td>
</tr>
<tr>
<td>9</td>
<td>Cancel</td>
<td>On tap cancel it should take user to the back step.</td>
</tr>
</tbody>
</table>

Login

Login screen enables the user to enter their valid information to interact with 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 will fill in again when the application is re-launch.)
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TOP-DOWN RECONFIGURATION
EMS TRAUMA REPORT

New High Acuity Case

Basic Information

- Name: John Marc
- Sex: Male
- Time: 07:00 am
- Date: 07/09/15
- Age: 23
- Area: Somewhere

Injuries

Mechanics of Injury

- Mechanism: Auto vs Bike
- Intubated: Yes
- Respiratory Rate: < 30
- Heart Rate: 80
- Systolic Blood Pressure: 120 / 80

Type of Injury:
- D = Deformity
- C = Contusion
- A = Abrasion
- P = Puncture
- B = Burn
- T = Tendee
- L = Laceration
- S = Swelling
- TQ = Tourniquet
- I = Impaled
- Q = Open Fracture
- G = Gunshot Wound
- V = Amputation
How do I become HIPAA compliant? (a checkup)

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’s next? What steps need to be taken in order to become HIPAA compliant?

1) Written regulation to accept fully identified persons only first and last name:
   a) ELABORATION: All users manually approved by an admin before or do anything

2) Authentication
   a) RESPONSE: We have an auth system, API requests are authenticated HTTP Basic (which will be over HTTPS in production), and then levels admin (rw on everything) doctor (rw on emergency cases) own emergency cases while active, then ro
   b)...

3) Logging
   a) RESPONSE: This is something we need to add. I’ll be using a logger framework (probably https://github.com/trentm/node-bunyan) to log to stdout, and it can be piped into files or whatever in production
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EMS TRAUMA REPORT

Android Development
User Interface Design
Front End Development
Back End Development
User Testing
HIPAA
Video
Market Research
Marketing Website
Pitch Deck and User Documentation
Application Name
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BOTTOM-UP RECONFIGURATION
EMS TRAUMA REPORT
TRUE STORY GAME

CRUSHING
Subtle looks, pounding pulse
However long the hover lasts
Between friend zone and fun zone
Android companion app spun up in the final week
ENTERPRISE WORKSHOP PORTAL
ROLE HIRES IN <14 MINUTES

<table>
<thead>
<tr>
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<th>True Story</th>
<th>Enterprise Portal</th>
<th>All Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median time</td>
<td>13:40</td>
<td>12:40</td>
<td>15:13</td>
<td>13:40</td>
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<tr>
<td>(mm:ss)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20 manual hires in a median 889 minutes (~15 hours)
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</tr>
</thead>
<tbody>
<tr>
<td># of pull requests</td>
<td>335</td>
<td>113</td>
<td>118</td>
<td>566</td>
</tr>
<tr>
<td>Mean pull requests per day</td>
<td>7.3</td>
<td>2.8</td>
<td>3.4</td>
<td>4.5</td>
</tr>
</tbody>
</table>
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

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