Key Takeaways: MIT Exposure Notification Webinar
24 September 2020

States Represented: VA, AL, NC, SC, CO, KS, CT, MO, TN, MA, PA, NH, NY, CA

I.   Alabama: Diagnosis Verification

The UAB Team discussed their exposure notification app, which is waiting for patent approval for its innovative feature — the verification workflow. Verification workflow stems from solving the problem that Public Health officials at Alabama are overworked. The team wanted to create a solution that required little effort from public health officials. Brian Rivers, CTO at the University of Alabama at Birmingham, discussed how the workflow works:

1. Enter the mobile number into the app.
2. Get the code from SMS.
3. Auto-populate the verification code.
4. Send the verification code to the Department of Health.
5. Hash the mobile number as a key and create a file with the matching key (include phone number verification through a one-time password and device verification by sending HMAC of keys on the device).

Rivers also notes that the workflow solves user convenience and anonymity (since the user doesn't have to call anyone). In the Escrow Architecture, the workflow has hourly feeds, while the key is generated every six hours. Some key points from his presentation are that some keys are never released if encrypted phone hashes are not received from the Department of Public Health and that the records in the Escrow server are cleaned after 14 days.

The challenges in the workflow were noted as followed:
1. The phone number is not always collected during testing.
2. The phone number is not always a mobile number.
3. A few labs are not reporting data yet to the Alabama Department of Public Health.
4. Some escrow keys are never released.
5. The whole process, from phone notification to the Alabama Department of Public Health notification, takes a couple of days.

Their app has been downloaded 68500 times, and there have been 149 positive test diagnoses.

Sam Zimmerman, CTO of PathCheck Foundation, said that PathCheck Foundation plans to expand this solution to other areas, adding that it would only take a few weeks to implement in other jurisdictions.

II.   MIT Innovation Roadmap beyond Exposure Notification

Ramesh Raskar, chairman of PathCheck Foundation, discussed how campuses could be a good testing area for these solutions. He also presented a list of challenges and corresponding solutions for exposure notification apps. The diagram summarizes the discussion:

Challenge	Innovation	Benefits
Test Verification workflow	Integration with manual or automated test partners	Reduce Workload
Features for efficacy and behavior	Communication, Engagement, Contextual Information	Promote behavior change
Connection to Manual Contact Tracing	Rich automated communication platform	Reduce case management work
Customization for Schools / Employers	Employer specific in-app screens to connect on-site manual contract tracing	Dashboard for state to understand each cluster
Integration with Testing, Entry pass	Open standards, will support many testing partner	Help restart economy
Rich insights and trends required for decisions	Insights by zip code, Understand super-spreader, index case, emerging clusters and spread analysis	Decide lockdown/ reopening policies

Exposure Notification was demoed, showing the user's process of answering questions and sending notifications to public health officials when given a possible exposure notification (while following privacy standards).

After the demo, various concerns from the US states were discussed, summarized by the below points and diagram.
- Consent is essential in exposure notification apps, and should only take info with direct consent rather than "sucking it up" without notification.
- We should focus on efforts to communicate non-identifiable information and privacy concerns to users.
- We should include a stage-gate portal for users to consciously opt to self-identify.

Concerns for US States	iOS ENX in Settings or Android Barebones ENX App	Full featured App	Comparison
Time Required	Submit the config file + Professional services	Use ready app + Professional Services	Same or time to develop new app
Adoption Boost	Android sends nudge to download Android ENX app No app for iOS	Nudge to download full app for Android Nudge to download full app for iOS	Same
Cost of Development Cost of Launch	Zero for development, Extra cost: Workflow/Legal/Comms	Zero for development, Extra cost: Workflow/Legal/Comms	Same
Cost of Maintenance, New features	Zero for barebones No extra features supported	Zero for open src app Extra cost: Professional services	Similar costs
Test Verification workflow	State must deploy manually with PHA	Integration with manual or automated test partners	Full app same or better
Features for efficacy and behavior	Basic EN and verification	Communication, Engagement, Contextual Information	Full app promotes behavior change
Connection to Manual Contact Tracing	No. 'If you are exposed, call this number' will increase DoH workload	Rich automated communication platform will reduce DoH work	Full app better for Dept of Health
Customization for Schools / Employers	No additions possible	Employer specific in-app screens to connect on-site manual contract tracing	Dashboard for state to understand each cluster
Integration with Testing, Entry pass	No additions possible	Open standards, will support many testing partner	Full app can help restart economy
Rich insights and trends required for decisions	No additions possible	Insights by zip code, Understand super-spreader, index case, emerging clusters and spread analysis	Full app helps states decide lockdown/reopening policies

III. PathCheck Foundation: EN Express vs Full APP

Adam Berrey, CEO of PathCheck Foundation, introduced himself and the organization, a nonprofit from MIT working to help governments use digital technology to battle COVID-19. The organization has three objectives:
- Develop non-commercial software (open source)
- Build an alliance of tech partners for COVID-19 digital solutions
- Work on insights with regards to research, analysis, industry standards.

The PathCheck app is being used by 50 million people across 8 jurisdictions. The organization has also built a QR code application in South Africa.

EN Express

Berrey proceeded to introduce EN Express, a new solution from Google and Apple to promote the adoption of EN.

He details the differences between the iOS and Android development of these apps:
- For IOS, there is simple EN (no app) which can function as a backstop for people who don't download the app. The simple EN can promote and co-exist with a full-featured app. The EN has no customization and only has minimal features.

- For Android, one can only build barebones android apps, which cannot co-exist with a full-featured app. There currently is no roadmap for significant new features. However, these apps are easy to update (by substituting the previous app with a full-featured app)

Berrey stated that every jurisdiction should enable EN Express for iOS, however, for Android, only US states with limited capacity to launch a full-featured app should use EN Express. Berrey noted that he is biased on this topic, but believes that having a unified front increases the adoption rates.

Next, Berrey talked about how PathCheck is helping jurisdictions by providing advice to evaluate the choice between a full-featured app and EN express, also noting that collaboration is important because people move between areas frequently.

Future Plans & Discussion

The discussion included the following plans:
1. Considering Integrated Experiences (customized based on affiliations)
2. Adding elements in education to test, trace, and isolate to vaccinate process
3. Customization of EN process based on the individual and their experiences (ex. If a student gets notified, then different actions should be offered for him or her)
4. Creating a context application where organizations could enter custom information

Berrey concluded the event by stating that the long-term value of developing this system is to create a public health digital infrastructure for future pandemic intervention.

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