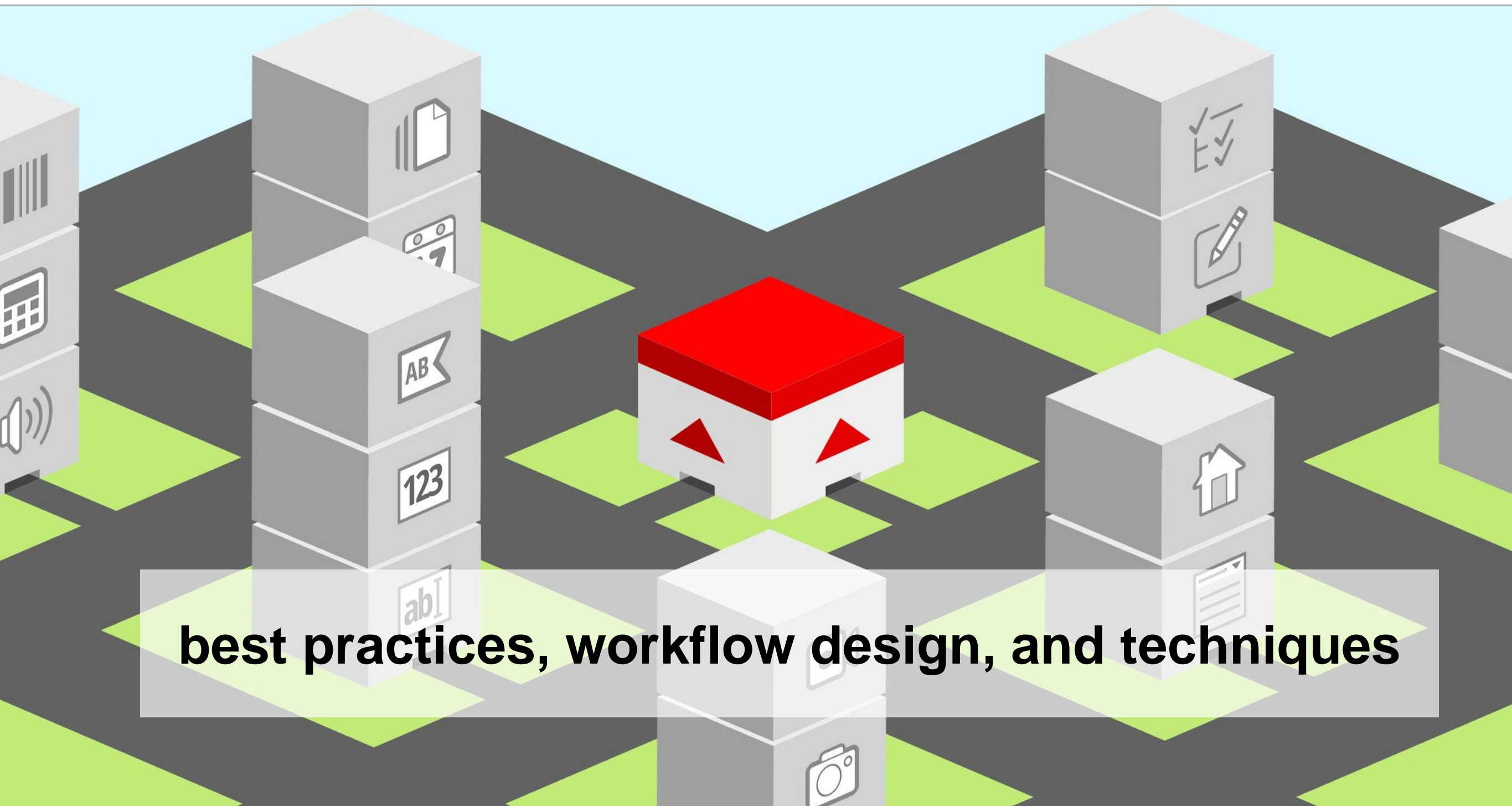


Automating Field Data Collection

Coleman McCormick
EVP, Fulcrum



Automating Field Data Collection



best practices, workflow design, and techniques

Coleman McCormick

EVP, Fulcrum

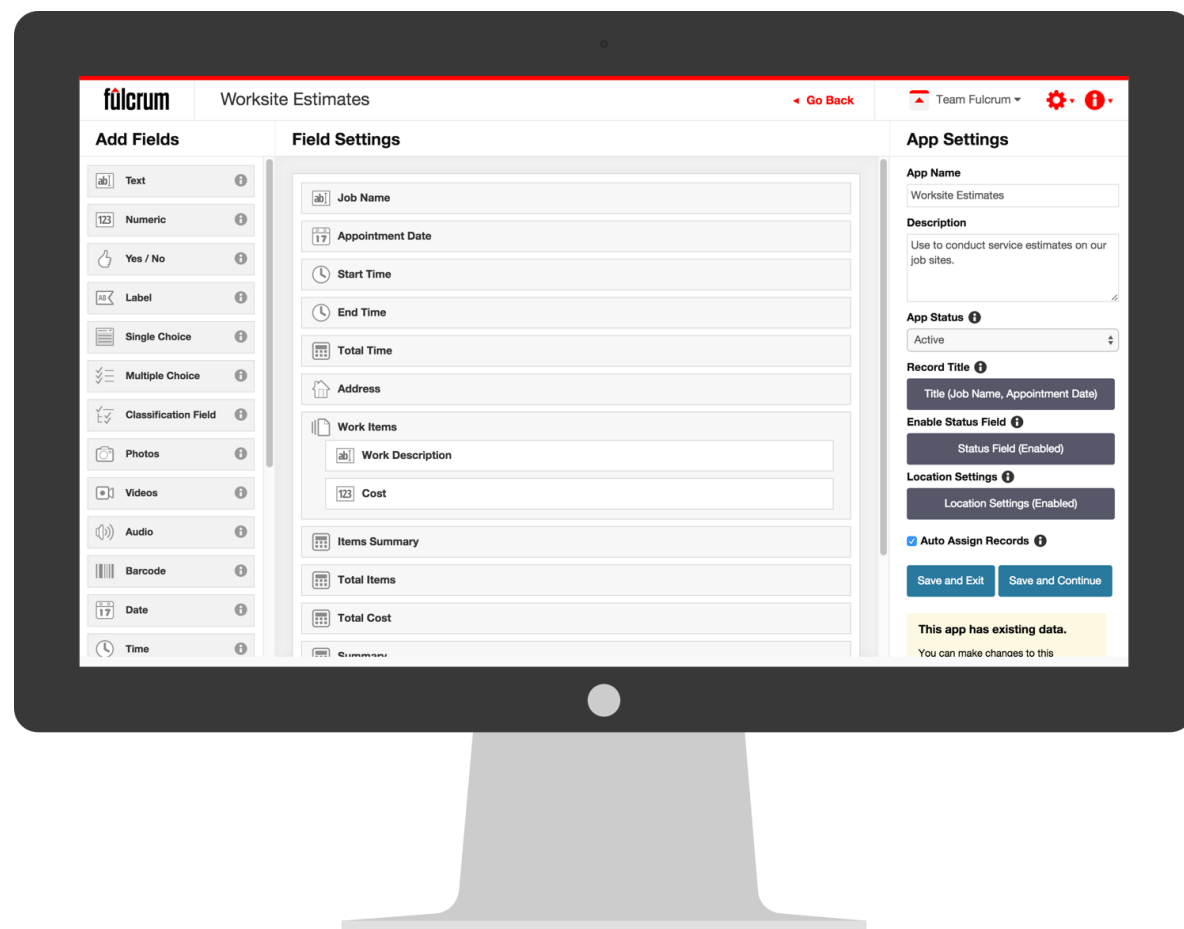
coleman@fulcrumapp.com

 @colemanm

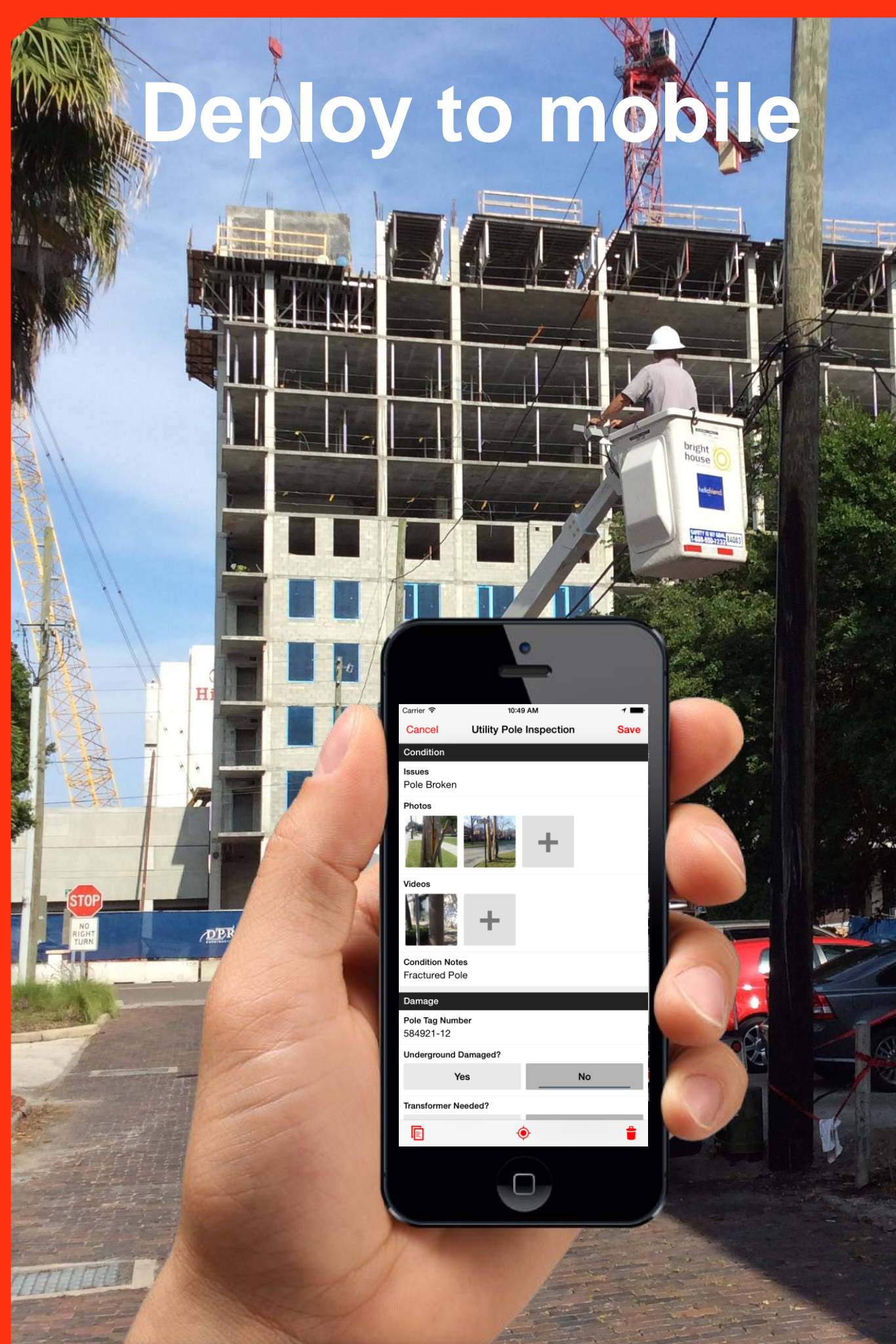




Build forms on cloud



Deploy to mobile



About me

12 years in mapping / GIS

7 years developing software products

Work with companies + organizations worldwide on
business process, data management, software

What we do

Software shop in St Petersburg, FL

Mobile forms — web, iOS, Android

Workforce management

Automation & streamlining of data collection

SaaS subscription service

Worldwide customer base

Field collection use cases

- Appraisals
- Damage assessments
- Code enforcement
- Public works
- Asset management
- On and on...

Agenda

Goals and objectives in collecting data

Brief history of data collection

A look at **workflow**

Friction and its causes

Techniques

Some **examples** of automation in action

Ideals + Goals

i need to collect some data.
what does “success” look like?

What's the ideal process?

- Think about goals and objectives
- What questions need answering?
- Who are the stakeholders? (Who's asking the questions?)
- Interviews — understand the “why” of the requirements
- Paint the picture
- Tasking your field workforces

start by defining the successful final result,
and work backwards!

amazing how many customers I consult
with can't clearly define the goals +
objectives

need consensus on goals from bottom to
top

bit.ly/amazon-product-dev

On-Demand

- Leadership wants answers to questions *now*, not 3, 6, or 12 months later
- Reporting on specific data views — the data I want, when I want it



Other key goals

- **Cost savings** — fieldwork is *expensive*; room for huge savings
- **Reliability** — critical data can't be wrong, costs incurred with unreliable inputs or systems
- **Speed** — decisions can't be made without the data in hand!
- **No duplication** of effort!

A Brief History

a rapid evolution in technology

pain

time between collection + decision = wide gap

Then we advanced, sorta



Finally!



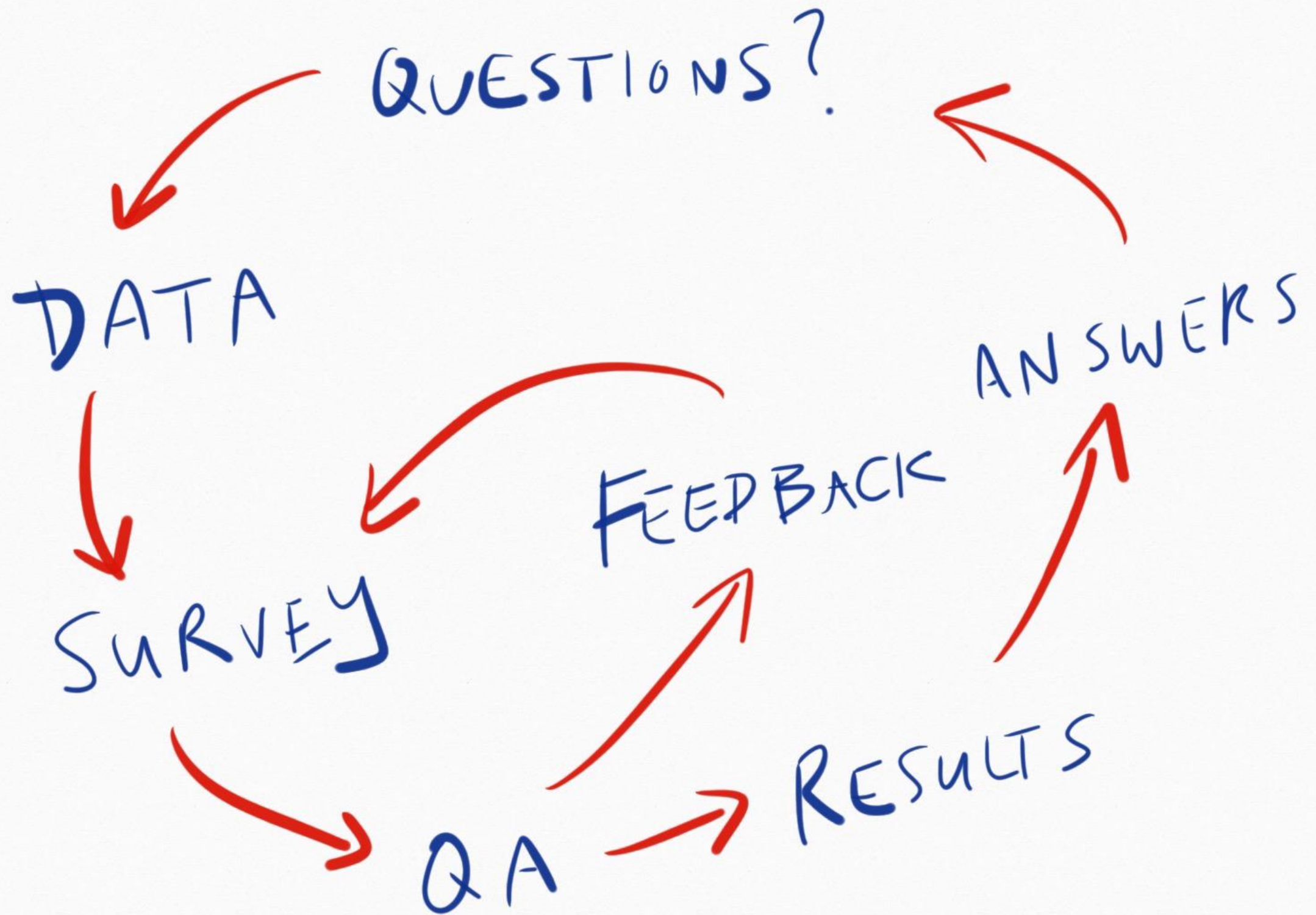
Integrated sensors
Mobile computing
Low cost
Ease of use

Historic challenges

- **Error-prone** — handwritten, hard to QC, clunky
- **Time-consuming** — lots of duplication, revisits to fix mistakes
- **Delays** — reporting + aggregation takes days or weeks
- **Difficult to integrate** — needs transcription / cleanup

Workflow

understanding, designing, iterating



Start at the beginning

- What questions need answering?
- What data do I need to get those answers?
- Who are the stakeholders?
- How will we get the needed info?

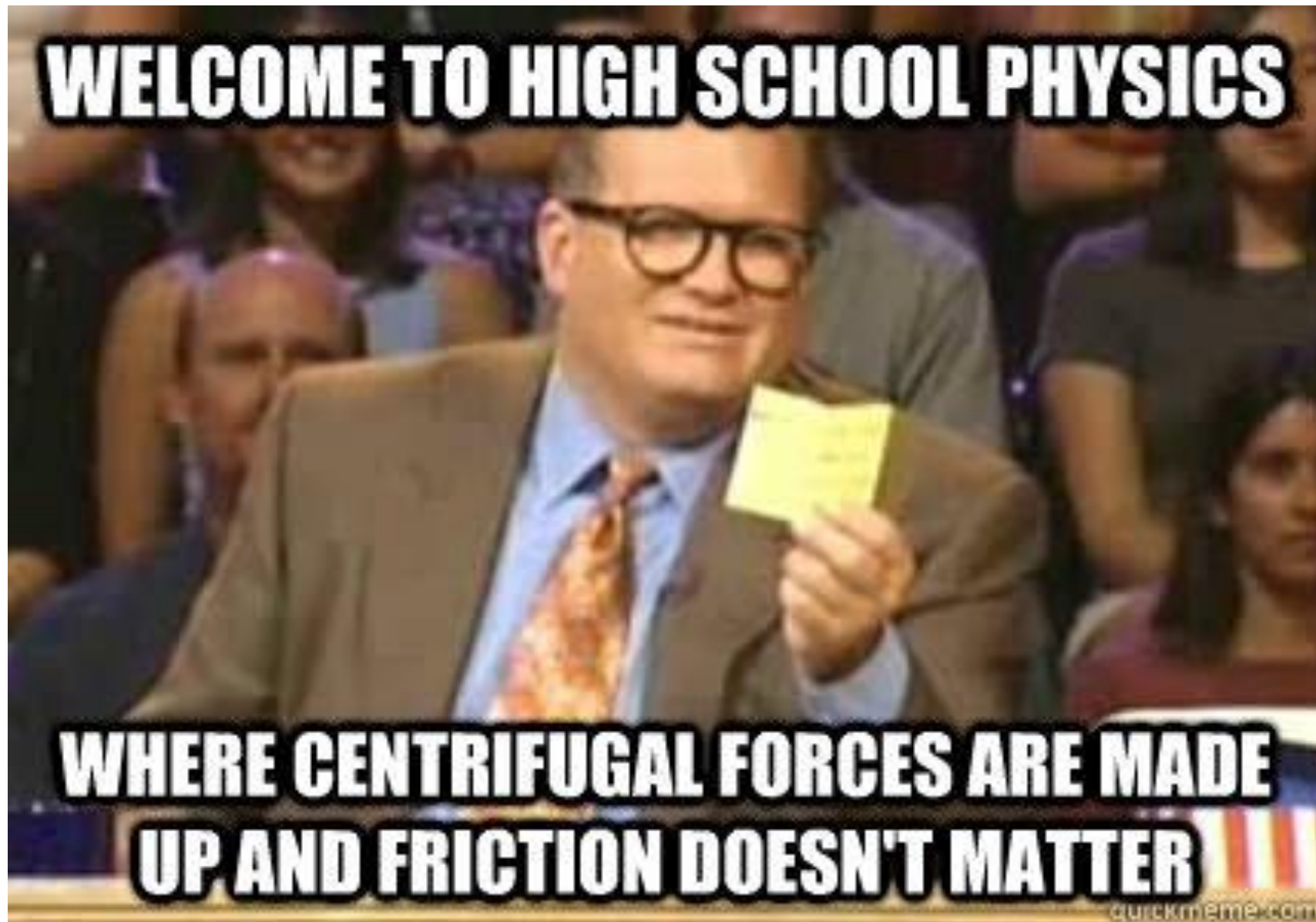
Friction

the source of our data management pains

Common sources of friction

- **Technology** — tools are too complicated, systems over-designed, “solution looking for a problem”
- **Work** — complexity of the work, steps in the workflow
- **Human factors** — compliance, need-to-know, organizational silos

There is *always* some friction in the workflow



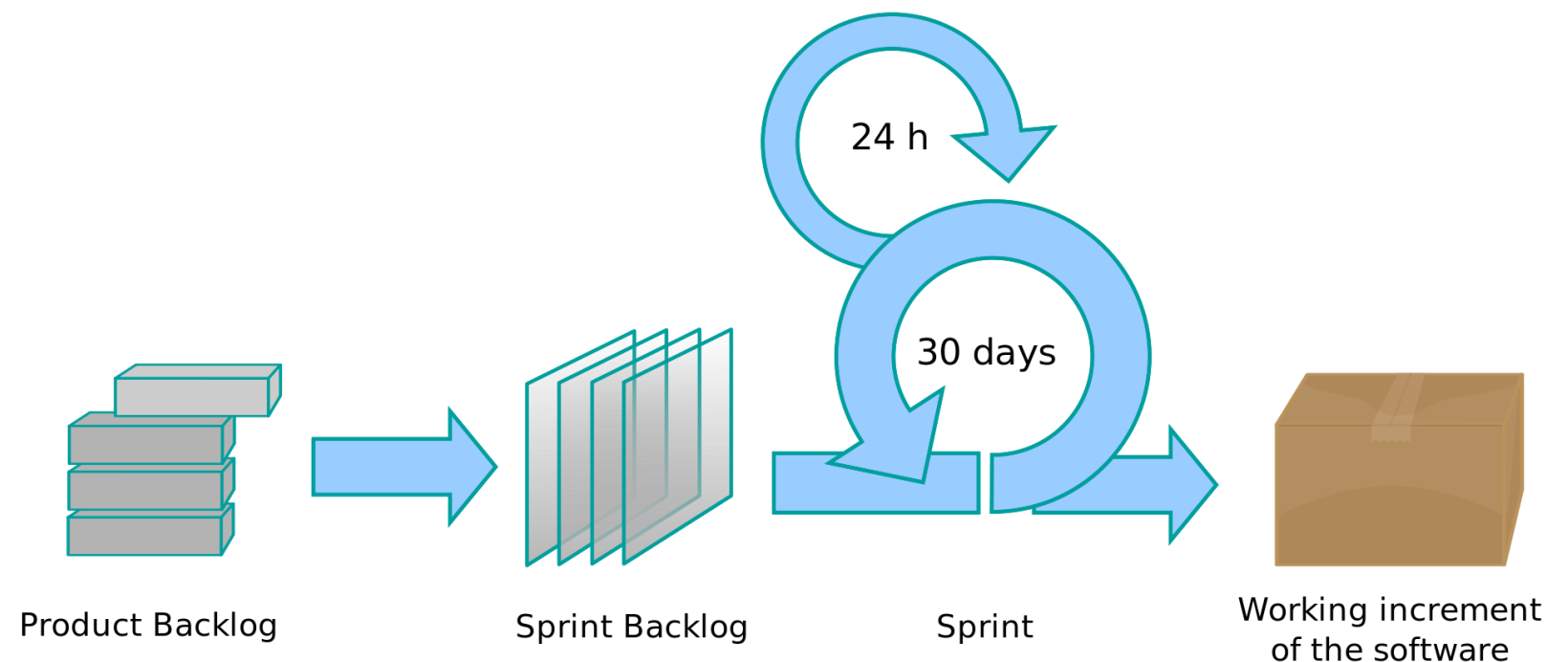
It's not all *bad*, but we should reduce what we can control

**Treat the *sources*, not the
symptoms.**

**If not, your workflow becomes
a patchwork of workarounds.**

Iteration

- Incremental reflection + improvement
- Look at whole workflow, seek frictions, test new methods to reduce, re-deploy, re-test
- Scrum!



A Few Techniques

demonstrating ways to reduce friction
(with tech)

Some samples of what this looks like

- Autofilling data
- Real-time QA
- StreetView integration
- Capturing weather data

Cancel

Pinellas Parcels

Save

Tax Parcel ID

Site Address

Tax District

Sub or Condo

Property Class Code

Property Class Description

Use Description

Owner Name

Structure Type

Total Gross SqFt

Market Value

Assessed Value

Autofilling parcel data

QA settings

read-only data



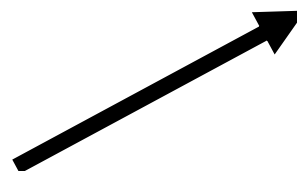
fields required for submission



validation



if-this-then-that conditions



●●●○○ AT&T 08:06 96%

Cancel Property Appraisal Save

Folio Number
747486030

PIN
U-12-30-20-2PR-000006-00001.0

STRAP Number
2030122PR000006000010U

Owner
Donald Scott Whitworth *

Year Built
1986 *




Year Remodeled
2000 *

Neighborhood Characteristics

Neighborhood Type
Suburban

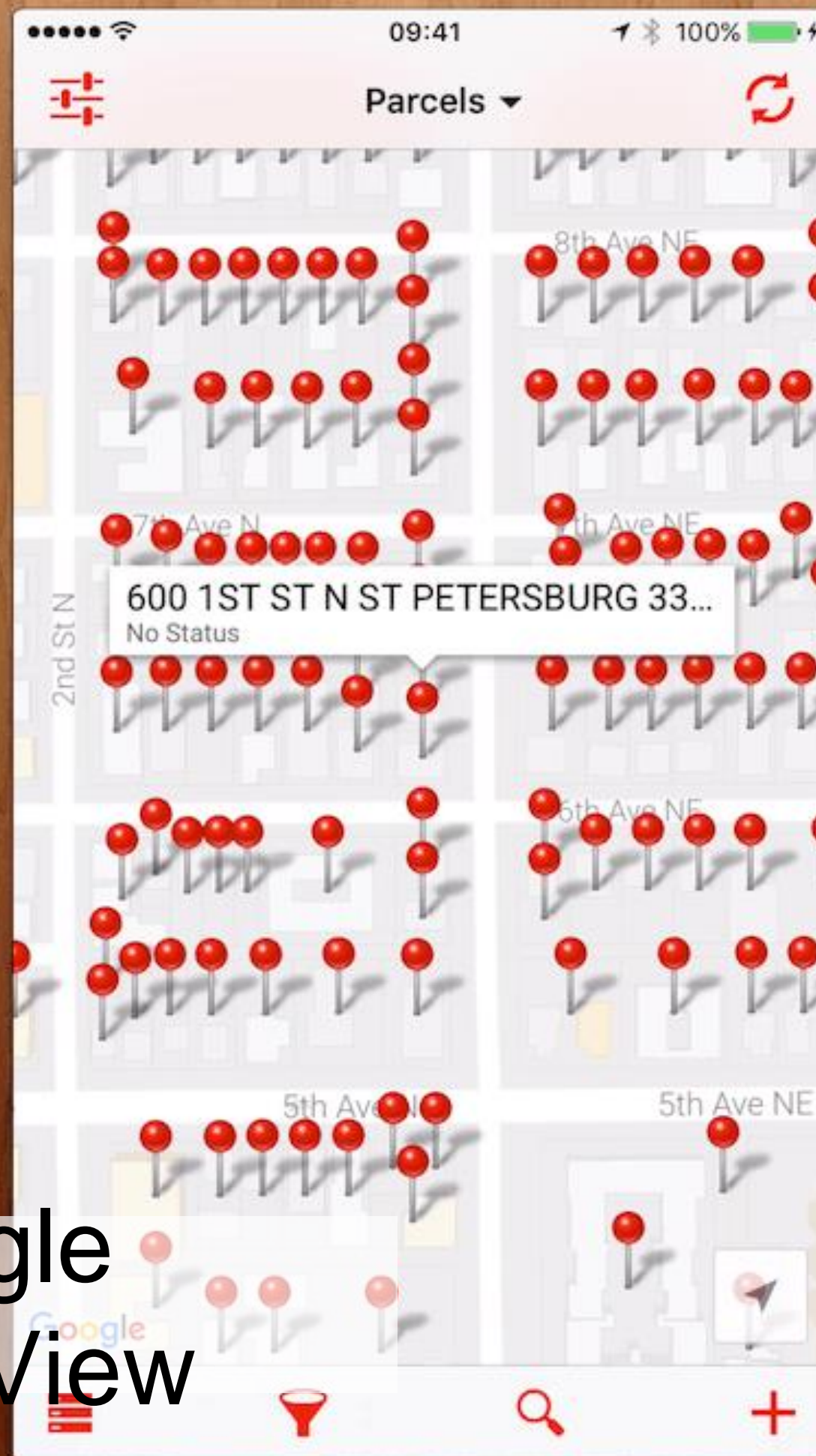
Built-up Level
25 to 75%

Growth
Stable

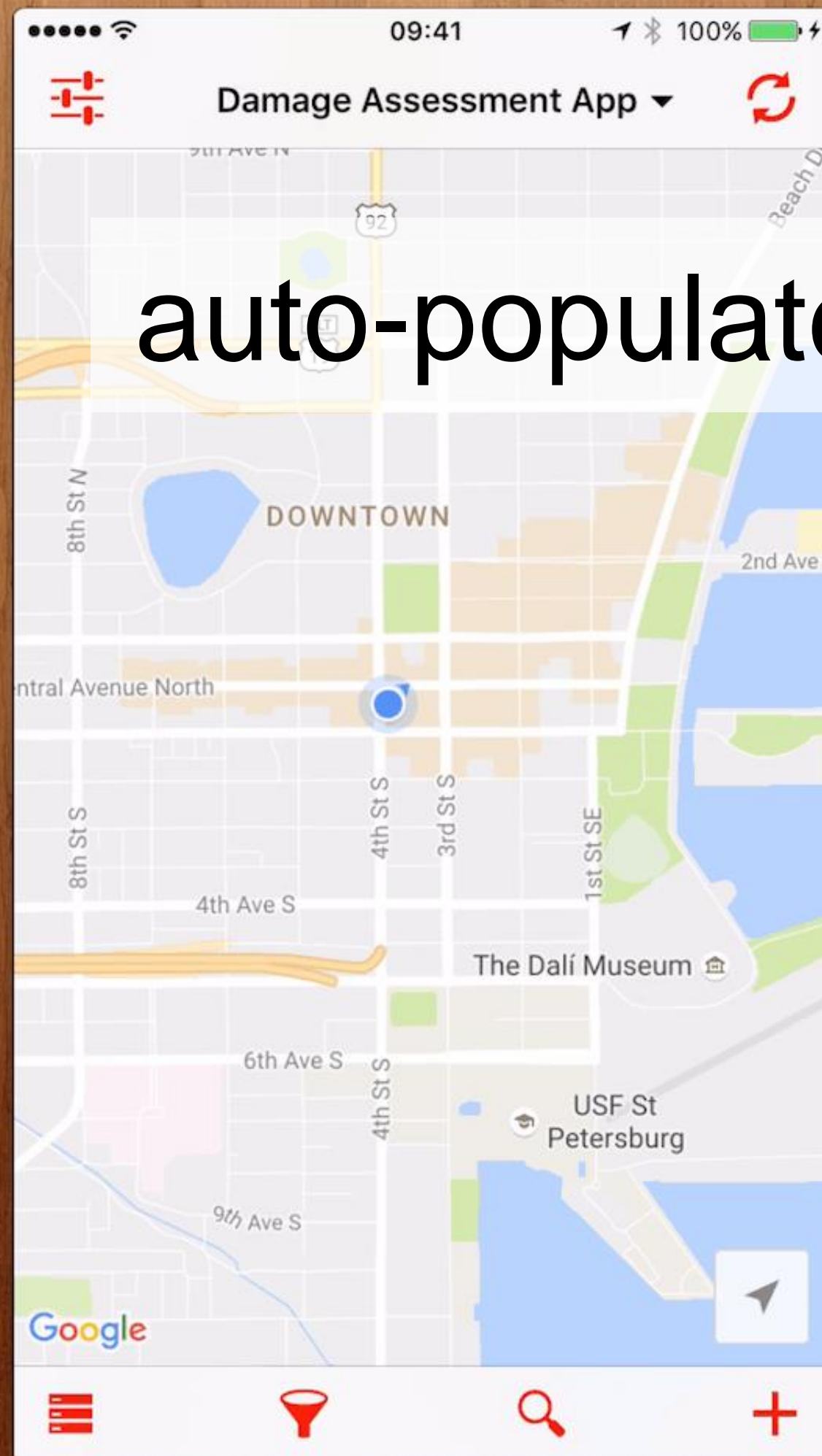
  



Live QA/QC



Google
StreetView



auto-populate weather

Audit trails + history

- History
- GPS locations
- Date / timestamp for work fact checking
- Digital toolchain can automate the “paper trail”

Automation in Action

examples from the field

Automation in action

- A few diverse examples:
 - **Comcast**
 - **HALO Trust**
 - **Century Engineering**
- One closer to home:
 - **Lake County Property Appraiser**

Comcast



- Reduction in revisits

The HALO Trust

The screenshot displays the HALO Trust mobile application interface. On the left, a map of Cambodia shows several red-shaded areas representing mine-affected zones, each labeled with a unique identifier: BS/CMAA/20842, BS/CMAA/20841, BS/CMAA/20840, BS/CMAA/20839, BS/CMAA/20838, and BS/CMAA/20837. The right side of the screen features a data entry form titled 'Cambodia EOD Callout'. The form includes fields for '7 Explosives Used for disposal', 'Detonating cord(m)', 'Safety', 'Electric detonator', 'Non-electric detonator', 'Explosive Charge', and 'Remarks'. Below these fields is a 'Photos' section with a plus sign icon and a small image of a mine. At the bottom, there is a section for '8 Reporting and Data Entry(Operator)' with a 'Reported by' field and a 'Name' field containing the text '81>Chim Sophy'.



fulcrumapp.com/cases/halo-trust

field data automation ♦  ♦ fulcrumapp.com/iaao

Century Engineering

DeIDOT Railroad Crossings
Tools

Navigation

Information Query

Warning Device: Pole

Photos

Pole Material	Aluminum
Device Breakaway Pole	No
Device in Median	No
Traffic Signal on Device	No
Audible Signal Present	Yes
Signs Mounted to Warning Device	Yes

Cantilever Info

Quantity of 8" Incandescents on Vertical	4
--	---

Rail Crossings

- At Grade
- ▼ Grade Separated
- Public Crossing
- Private Crossing
- Closed/Abandoned
- Rail Banked
- Inventory Pending
- FRA Discrepancy

Crossing Assets

- ◆ Crossing Limit
- Crossing Approach
- ◀ ▶ Crossing Quadrant
- ✕ Warning Device
- ⬢ Rail Equipment

Developed by Century Engineering



fulcrumapp.com/cases/century-engineering

field data automation ♦  ♦ fulcrumapp.com/iaao



Lake County Property Appraiser

Michael Prestridge, Chief Deputy, Lake County Property Appraiser

- Damage Assessments
- Assessment forms link back to parcel base data
- Uploaded CAMA data to cloud for reference
- Satellite / street maps for quick context in the field
- Offline support keeps people working

The screenshot displays the Fulcrum web application interface. At the top, the browser address bar shows `web.fulcrumapp.com`. The application header includes the Fulcrum logo, a "DAMAGE ASSESSMENT" dropdown menu, and a "Lake County Project" button. Below the header, there is a search bar labeled "Search Records" and filter options for "No Status Filter" and "No Project Filter". A map view shows a residential area with numerous colored pins (green, yellow, orange, red) indicating different damage statuses. A data table overlay is visible on the right side of the map, showing details for a specific record (ID 3797174).

Filter and view assigned rolls in real-time.

View pin 'status color' change in real-time.

Download results anytime.

3797174	
Location	28.5017691, -81.723555
Status	Major
Assigned to	Rob Brown
Project	
Created	2015-04-08 14:32 -04:00 (21 days ago) by Joe Ward
Updated	2015-04-28 10:45 -04:00 (a day ago) by Rob Brown
Parcel Information	
Alternate Key	3797174

Field Usage

Damage Assessment Report

Status: Major

Parcel Information

Alternate Key
3797213

Occupant Information

Occupants Name
STERLING SMITH

Situs Address
4285 FAWN MEMORIES LANE

City
CLERMONT

Phone Number
407-592-5556

Email

Occupancy Status

Insurance Status

Structure Information

Structure Name

Structure Type
Residential

Structure Quality
Good

Type of Damage
Hurricane

Damage Categories

Levels of Damage

Estimated Override Building Value

Photos

Legend:

- Unchecked
- Destroyed
- Major
- Minor
- Affected

Structure Type dropdown:

- Residential
- Commercial
- Multi-Family
- Mixed Use
- Mobile Home
- Other

Types Of Damage dropdown:

- Fire
- Fire & Wind
- Flood
- Flood & Wind
- Wind
- Sinkhole
- Hurricane
- Tornado
- Other

Status Dropdown:

Destroyed, Major, Minor, or Affected.
Color coded to FEMA colors.

Pre-populated CAMA data

Tap form to open drop-down menu.

“Override Value” field.

Add Photos.



Thanks!

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Michael Prestridge

Chief Deputy, Lake County PA

mprestridge@lcpafl.org

fulcrumapp.com/blog

@fulcrumapp