Modernizing Geologic Field Systems: The Transition from ArcPad to Collector

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Field Teams and ArcPad

current field system
ArcPad

**Good**
- 8 years, 0 Failures
- Highly customized for geologic mapping
- Good staff/project uptake due to ease of use
- Self-contained, works offline
- GPSGate allows multiple applications to use a single GPS unit
- Transitioned FGS field mapping out of the dark ages of paper maps

**Bad**
- Developed by single staff member, doesn’t pass the ‘lottery test’
- Custom VB application
- Custom python toolbox for project & data management
- Existing GPS + GPSGate did not work with Windows 10 upgrade
- Shapefiles and lack of nulls creates data issues
- Many, many interlocking parts (VB code, python code, apl styles & forms, ArcMap style, etc.)
- Required data transformations in and out
Esri Collector

the new kid on the block
**Esri Collector** for field mapping

- Completely customized applications built for individual project needs or broad use
- Accessibility across multiple platforms
- Plays nicely with organizational Esri enterprise accounts
- Compatible with most devices

**Features**:
- Collect and update information in the field and log your current location.
- Use Collector for ArcGIS online or offline - regardless of your network availability.
- Work on iOS, Android, and Windows.
- Supports external receivers for improved spatial accuracy.
The Development Process

1. Needs Assessment
2. User Feedback
3. Field Testing
4. Implementation
5. Enterprise GIS / IT Coordination
Needs Assessment

Existing System (ArcPAD)
- High-resolution tracklog collection
- Access to prior fieldwork data
- ‘Quick drops’
- Offline access to data
- Staff attribution

New Features (Collector)
- Data compiled and saved within ArcOnline
- Data access anywhere on any device
- Downloadable basemaps

Must haves for the new field system
Coordination with IT Department & Implementation

- **Intra-FDEP Cooperation**
  - OTIS-GIS
  - FGS

- **Documentation & implementation of existing, complicated data model**

- **Delay of development**
  - Custom backend code for tracklogs
  - Custom backend code for merging new data with pre-existing data

- **Key Lessons**
  - Important to consider agency restrictions
  - Not all functionality is replicable
  - Custom solutions require development time
Hardware Testing

- Before testing could begin: GPS incompatibilities
  - The ‘Bluetooth Only’ Problem
  - Embedded GPS in tablets has a poor accuracy
  - Bad Elf Pro - $599.99
    - Accuracy ★★★☆
    - Ease of Use ★★★★☆
    - Dependability ★★★★☆
  - Trimble R1 Unit - $2,200
    - Accuracy ★★★★☆
    - Ease of Use ★★★★☆
    - Dependability ★★★★☆
- Poor Collector documentation
- GPSGate failure
Online Platform

- Many features Wifi dependent
  - Basemaps
  - Pushing and pulling data
- Verizon Mifi
  - Data plan increased to account for overage
- Still not entirely dependable
- Failure when attempting to download offline maps

However, with a good Wifi connection...
- Back at the office, GIS users were able to:
  - Track field progress
  - Upload data to field teams
  - Edit and see data as it was being created
User Feedback

**Good**
- Accessible on any device – ‘grab and go’
- Share data between teams
- Ready to use
  - Pre-existing forms and data translated well
- Trimble R1 was an excellent compliment to Collector
- Great basemaps (with Wifi)
- Bonus features when Wifi connection was available

**Bad**
- Offline mode unfunctional after tracklog customization
- Tracklog max acquisition rate: 30 seconds
- Lack of ‘quick drops’ resulted in frustration among staff
- BadElf had a very poor update rate and accuracy issues
- Add-ons greatly increased not only overall cost, but also beta testing
Final Verdict

- Collector performs best with a highly limited scope of development
- Don’t throw the ‘kitchen sink’ at it!
- Target limited functionality and break it into smaller, specific applications
- High cost of compatible Bluetooth GPS units requires additional funding for upgrades
- Unreliable offline maps
- Not good for navigation
- Works best with a wifi connection
  - Not reliable for remote fieldwork
- Still using ArcPAD

But..

- Survey 123 was surprisingly underrated
- Helping to begin the process of organizing over 19,000 data points...
Survey 123

Like Collector
- Supports multiple users
- Accessible across all devices
- Nesting menus
- "Works" on or offline

Unlike Collector
- Easily customizable
- No need to get IT involved
- No additional GPS hardware required
- Easy for non-GIS users
- No crashing
- Dependable data uploads
- Create vast amount of tabled data
- Spatial component available
400

new surveys since October – drastic acceleration

11,680

new boxes inventoried

50%

half way there..
Any Questions?

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