

Optimizing Field Data Collection using ArcGIS Enterprise and ArcGIS Mobile Apps



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The Problem – Field Operations

- Multiple GPS data collection workflows
- Mix of handheld GPS units and tablets
- Third party GPS data collection applications
- Field crews used PMFs on laptops
- Requires manual work to export GPS data

The Problem – Data Center Operations

- Workflow 1:
 - Differentially correct and post-process handheld GPS data
 - Several hour long process!
- Workflow 2:
 - Download GPS Data from the cloud and post-process
 - Several hour long process!
- Send GPS data back to the field crews
- Very little automation

How Do We Optimize Workflows?

- How can we save time in the field?
- How can we standardize our workflows?
- How can we save time for GIS Analysts processing the data?

The Solution – Leverage the Esri Platform!

- ArcGIS Enterprise
 - Portal, Server, Data Store
- Survey123
- Collector
- Explorer
- Workforce

Transition to Web Maps

- Data is always live
 - No more “snapshots” of data stored on local computers
- Eliminated editing shapefiles in the field
- Eliminated the transfer of GIS data via FTP for use in ArcReader
- Can view data on a tablet/phone instead of a laptop
 - Enabled use of Collector and Explorer

Previous Data Collection Issues

- Little to no logic capabilities
- Un-needed data entry
- Difficult to develop

Survey123 – A Game Changer!

- Significantly improved data collection workflows
- Easier to develop
- Within the Esri platform
 - No third party applications!

Transition to Survey123

- Replaced most GPS data collection workflows with Survey123
- Field crews submit their data live in the field
 - No more end-of-day transfers to the FTP!
- Simple and easy to use!

Data Validation with Survey123

- Reduced human error with logic-based GPS data collection forms
 - Previous data collection methods had little logic capabilities

type	name	label	relevant
select_one gas_feature	gas_feature	Gas Feature	
text	feature_other	Describe Other	selected(\${gas_feature}, 'other')
select_one yes_no	inside_foundation	Inside Foundation?	selected(\${gas_feature}, 'meter')
image	meter_photo	Gas Meter Photo	selected(\${gas_feature}, 'meter')

Less Manual Data Entry with Survey123!

- Reduced manual input of data
 - Custom Survey123 URL
 - Pre-populates fields in Survey123 form
 - Allows for relational data capture!

- arcgis-survey123:///?itemID=Survey123PortalItemID&field:parcel_id={Parcel}&field:address_id={ADDRESS_ID}

Explorer

- Good for areas with poor cellular coverage
- Maps load instantly on the device
- Automated generation of MMPKs

Workforce – Assigning Work

- Allows managers to easily assign work
- Can see work completed in real-time
- Custom URL link to Survey123
 - Launch Survey123
 - Pre-populates fields in Survey123

Optimizing Data Center Workflows

- Optimizing field data collection = Optimizing data center workflows
- ArcGIS Data Store
- FME Desktop/Server

Optimizing Post-Processing of Data

- Survey123 data is submitted to the ArcGIS Data Store
- Stored as a hosted feature service in Portal
- Allows crews and analysts to see the data being collected in real-time

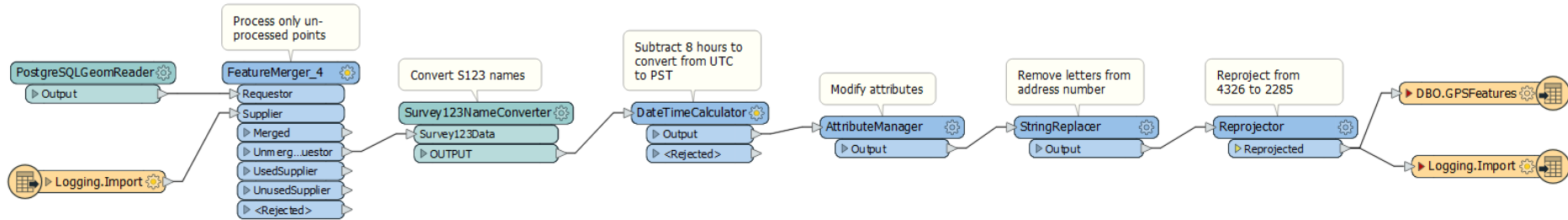
Optimizing Post-Processing of Data

- Use FME to ETL the data from the data store to our production EGDB's
 - No more manually post-processing data or using complicated scripts!
 - No more spending hours waiting to download data from the cloud!
- Completely automated and hands-off

GPS Post-Processing Workflow

1. Submit Survey123 data
 - Submitted to ArcGIS Data Store (staging database)
2. ETL the data from the data store to production EGDB's using FME Desktop
3. Use FME Server to automate the ETL processes made in FME Desktop

FME GPS Import Workspace



FME – Attribute Manager

Input Attribute	Output Attribute	Attribute Value	Action
crew_leader	Crew_Leader	SurveyorName	Rename
inspection_order	Inspection_Order	5 Possible Values	Rename
reason_to_end	Reason_To_End	7 Possible Values	Rename
adrcertain	AdrCertain	3 Possible Values	Rename
prefix_dir	Prefix_Dir	10 Possible Values	Rename
suffix_dir	Suffix_Dir	18 Possible Values	Rename
lateral_feature	Lateral_Feature	23 Possible Values	Rename
unable_to_inspect	Unable_to_Inspect	8 Possible Values	Rename
cleanout_type	Cleanout_Type	5 Possible Values	Rename
co_interiorlocation	A_CO_InteriorLocation	6 Possible Values	Rename
lateral_subtype1	Lateral_Subtype1	8 Possible Values	Rename
lateral_subtype2y	Lateral_Subtype2Y	4 Possible Values	Rename
lateral_subtype3	Lateral_Subtype3	5 Possible Values	Rename
wyebbranchinspec	WyeBranchInspec	5 Possible Values	Rename
visually_inspected	Visually_Inspected	4 Possible Values	Rename
cleanoutdirection	CleanoutDirection	5 Possible Values	Rename
obstacle_type	Obstacle_Type	8 Possible Values	Rename
reason_not_located	Reason_Not_Located	8 Possible Values	Rename
how_placed	HowPlaced	3 Possible Values	Rename
gpsaccuracy	GPSAccuracy	5 Possible Values	Rename
gpsconditions	GPSConditions	6 Possible Values	Rename
	DateAdded	@DateTimeFormat(@DateTimeNow(), %Y%m%d)	Set Value
	GPS_Date	@DateTimeFormat(@Value(inspection_datetime), %Y%m%d)	Set Value
	GPS_Time	@DateTimeFormat(@Value(inspection_datetime), %H%M%S)	Set Value
	ImportDate	@DateTimeNow()	Set Value
	ProjectNumber	1499	Set Value
	ProcessName	Lateral Features - Points	Set Value
	ImportGUID	globalid	Set Value
	SurveyorName		Set Value
inspection_datetime	inspection_datetime		Do Nothing
Email	Email		Do Nothing
objectid	objectid		Do Nothing
globalid	globalid		Do Nothing
username	username		Do Nothing

Test Condition	Attribute Value
If @Value(Inspection_Order) = start	<input type="checkbox"/> Start
Else If @Value(Inspection_Order) = intermediate	<input type="checkbox"/> Intermediate
Else If @Value(Inspection_Order) = end	<input type="checkbox"/> End
Else If @Value(Inspection_Order) = solo	<input type="checkbox"/> Solo
Else If	
Else <All Other Conditions>	<input type="checkbox"/> <No Action>

Time Savings and Productivity Gains!

- Crews no longer import GIS data
 - Easily view data on tablets/phones
- Crews easily submit their data
 - No more uploading their data via FTP
- Completely automated post-processing of GPS data

Time Savings and Productivity Gains!

- Data validation in the field through Survey123
 - Improved data quality reduced the need of Data Analysts to QA/QC data
 - Eliminated 160 labor hours of work per week
- Survey123 tripled rate of inspections!
 - Estimated savings of 10 labor hours per week per crew

End Result – Huge Success!

- Data collection workflow simplified
 - Better quality data
- Data processing workflow simplified
 - Automation!
- Saving \$\$\$ every day!

Thank you! – Questions?

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