

Lessons learned from one of New Zealand's most challenging civil engineering projects: rebuilding the earthquake damaged pipes, roads, bridges and retaining walls in the city of Christchurch 2011 - 2016.

SCIRT Mobile Apps - Setup and operation using FME Desktop and Server

Story: Data Collection Applications

Theme: Finance and Business Systems

A presentation which was given as part of the FME Desktop World Tour in 2015 in Christchurch.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit www.scirtlearninglegacy.org.nz



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SCIRT Mobile Apps: Setup and operation using FME Desktop and Server

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27 April 2016

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What is SCIRT?

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New Zealand Government



Consultancies



Programme funded by

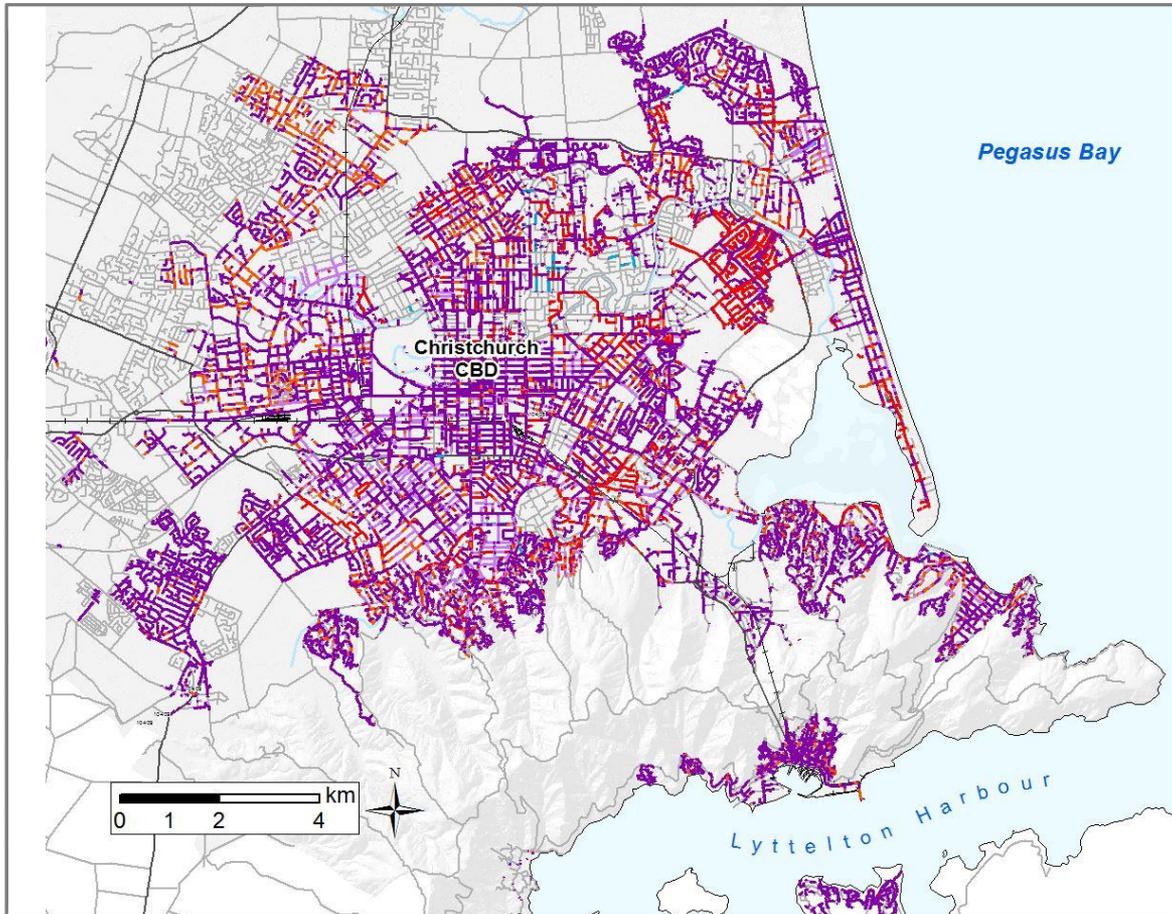


New Zealand Government



Background

Ekki Scheffler (ekkehard.scheffler@jacobs.com)



Wastewater, Stormwater, Water Supply:

- 25% of networks to be repaired or replaced
- 750km of pipework
- 50,000 assets to be recorded



Every new or repaired asset

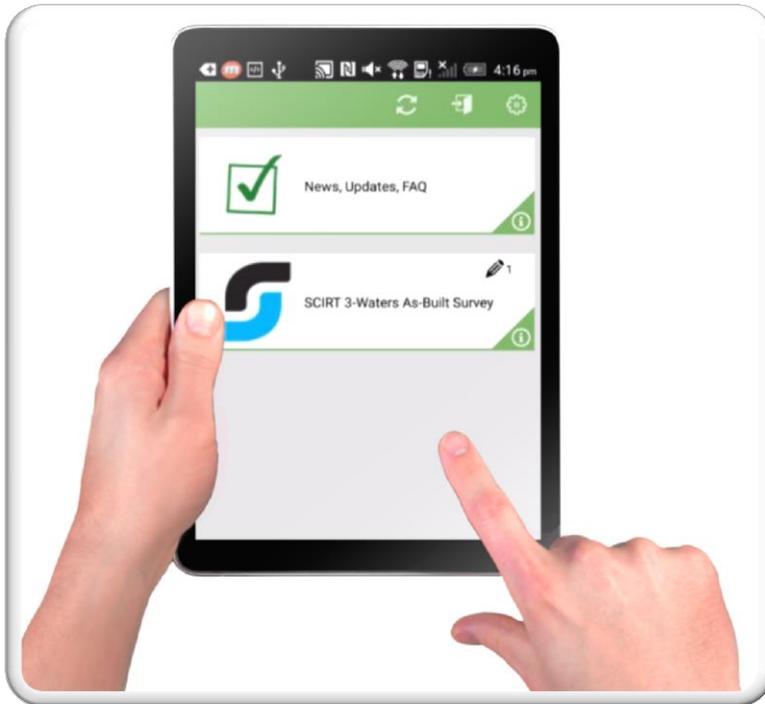
- spatially surveyed 3D
- recorded with complete and correct attributes

SCIRT's Mobile Apps

Ekki Scheffler (ekkehard.scheffler@jacobs.com)

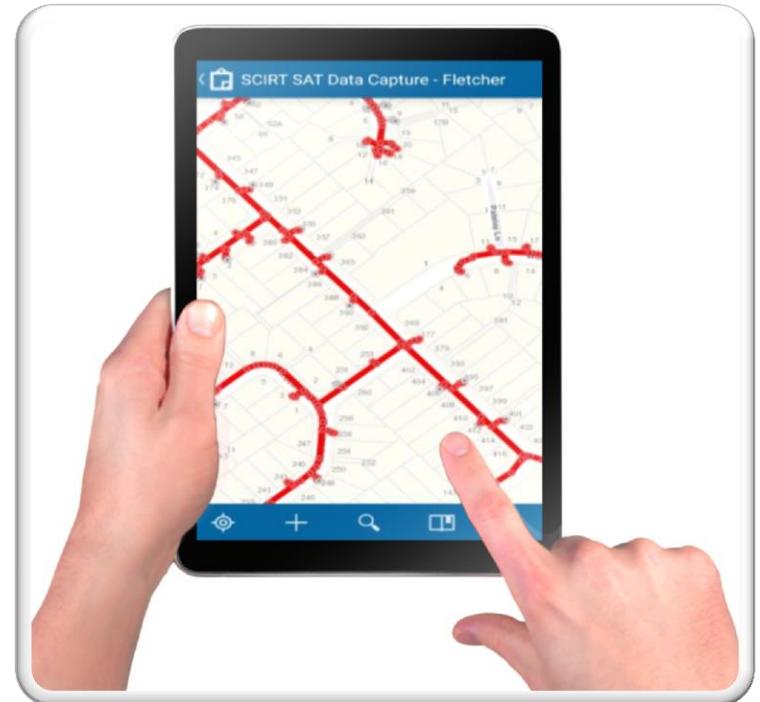
i FormBuilder

On-site attribute collection



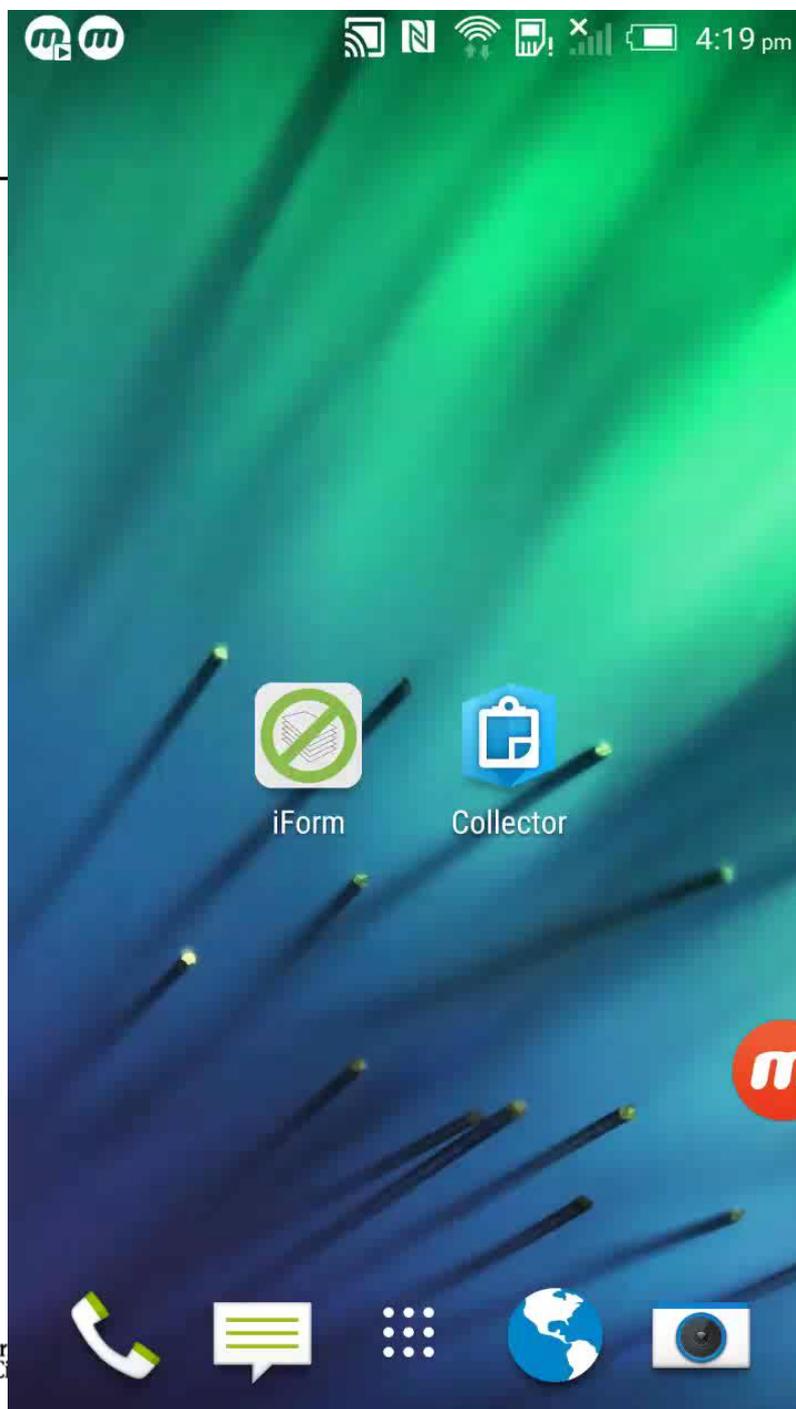
ESRI Collector

Draft data revision



iFormBuilder

Ekki Scheffler (ekkehard.scheffler@jacobs.com)

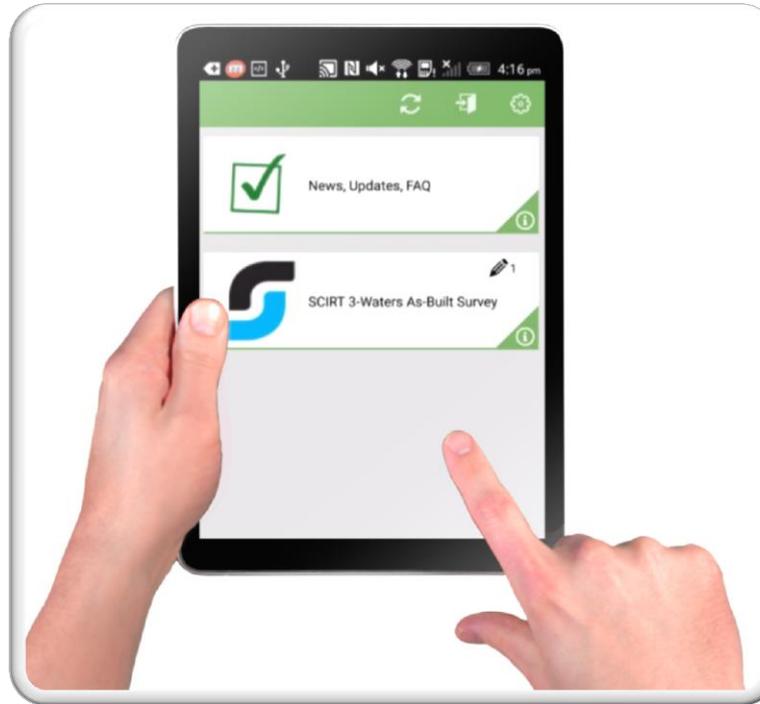


iFormBuilder – what we need

Ekki Scheffler (ekkehard.scheffler@jacobs.com)

Need to create and maintain:

61 Forms with
1200 Elements and
600 Pick List Values



Need to submit records to GIS database:

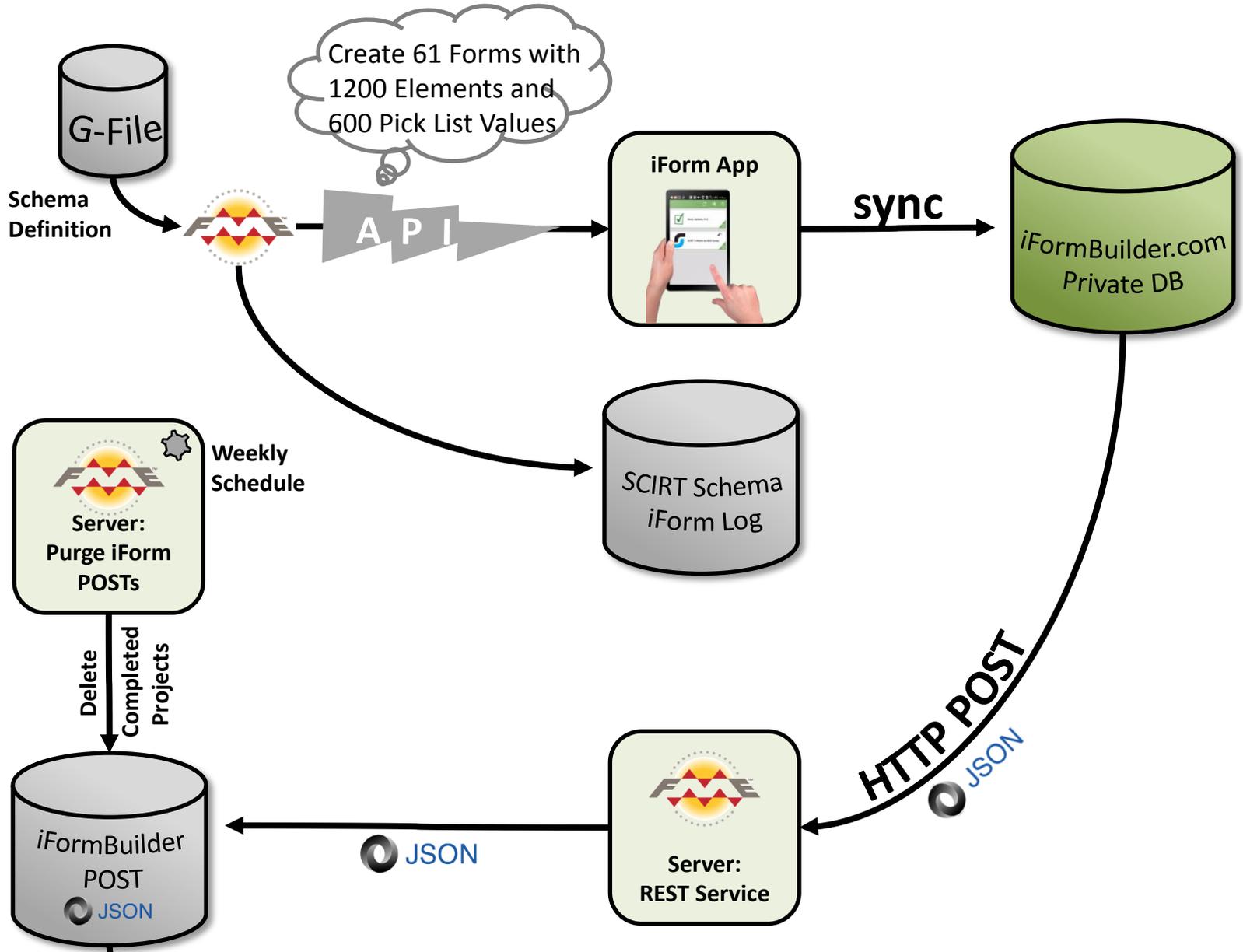
Do this automatically
Don't lose anything

Must be available to users:

Downloadable
anytime, correct
Format and schema

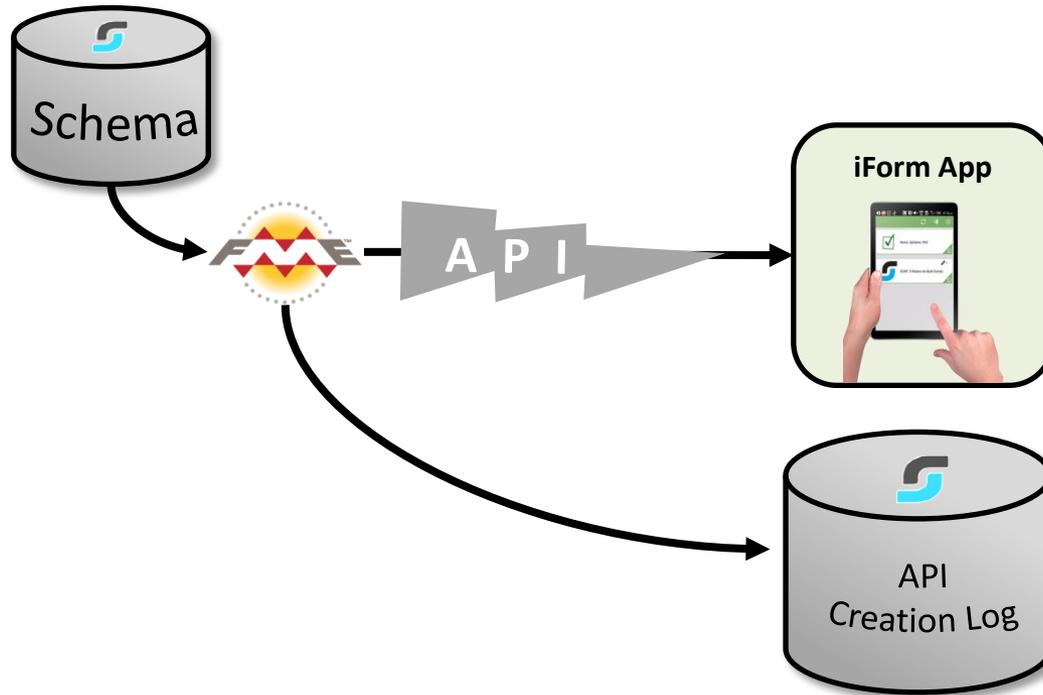
iFormBuilder – Solution

Ekki Scheffler (ekkehard.scheffler@jacobs.com)



iFormBuilder – FME: Form Creation

Ekki Scheffler (ekkehard.scheffler@jacobs.com)



FME and iForm API

Ekki Scheffler (ekkehard.scheffler@jacobs.com)

www.scirt.iformbuilder.com



CREATE PAGE:
{ "NAME": "scirt3waters",
 "LABEL": "SCIRT 3-Waters As-Built Survey" }

FIELD DETAILS:
{ "NAME": "drw",
 "LABEL": "Drawing Number" }

CREATE FIELD:
{ "DATA_TYPE": Number }

CREATE FIELD:
{ "DATA_TYPE": Text }

REST

FME and iForm API

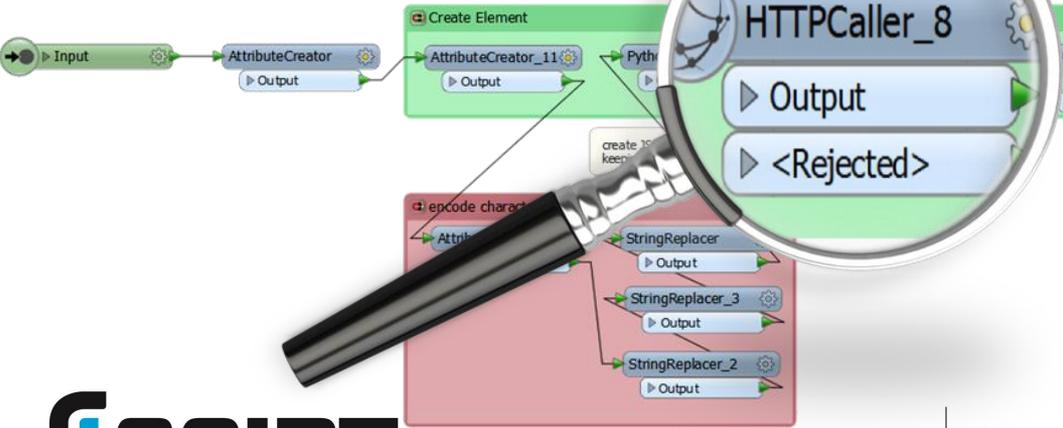


Parameter:

NAME*	string	name of the element
LABEL*	string	label of the element
DESCRIPTION	string	description of the element
DATA_TYPE*	int	data type of the element
DATA_SIZE	int	data size of the element
SORT_ORDER	int	sort order of the element
WIDGET_TYPE	string	widget type of the element
OPTION_LIST_ID	int	option list id of the element
DEFAULT_VALUE	string	default value of the element
LOW_VALUE	string	low value of the element
HIGH_VALUE	string	high value of the element
DYNAMIC_VALUE	string	dynamic value of the element
IS_REQUIRED	boolean	1 if element is required, or else 0
CONDITION_VALUE	string	conditional value of the element
CLIENT_VALIDATION	string	client validation of the element
IS_DISABLED	boolean	1 if element is disabled, or else 0
REFERENCE_ID_1	string	reference id 1 of the element
REFERENCE_ID_2	string	reference id 2 of the element
REFERENCE_ID_3	string	reference id 3 of the element
REFERENCE_ID_4	string	reference id 4 of the element
REFERENCE_ID_5	string	reference id 5 of the element
ATTACHMENT_LINK	string	attachment link of the element
IS_READONLY	boolean	1 if element is readonly, or else 0
VALIDATION_MESSAGE	string	validation message of the element
IS_ACTION	boolean	1 if it is an action element, or else 0
SMART_TBL_SEARCH	string	form name for the smart table search
SMART_TBL_SEARCH_COL	string	column name for the smart table search
IS_ENCRYPT	boolean	1 if element is encrypted, or else 0
IS_HIDE_TYPING	boolean	1 if hide typing, or else 0
KEYBOARD_TYPE	string	keyboard type of the element
DYNAMIC_LABEL	string	dynamic label of the element

Return:
ELEMENT_ID int created element ID

For DATA_TYPE int values see <https://iformbuilder.z>



HTTPCaller Parameters

Transformer Name: HTTPCaller_8

Request URL: :t/api/profiles/@Value(ProfileID)/pages/@Value(PageId)/elements

HTTP Method: POST

Query String Parameters

Headers

Name	Value
Authorization	Bearer @Value(token)
X-IFORM-API-VERSION	5.1
X-IFORM-API-REQUEST-ENCODING	JSON

Body

Upload Data: Specify Upload Body

Upload Body: Code_JSON

Upload File: []

Content Type: JSON (application/json)

Multipart Upload

Response

Save Response Body To: Attribute

Response Body Attribute: _response_body

Response Body Encoding: <Auto Detect from HTTP Headers> (auto-detect)

Save Response Body To File

Response Headers and Status

HTTP Client Options

Save Cookies: No

Follow Redirects: Yes

Verify SSL Certificates: Yes

Connection Timeout Length (seconds): 60

Transfer Timeout Length (seconds): 90

Use Authentication

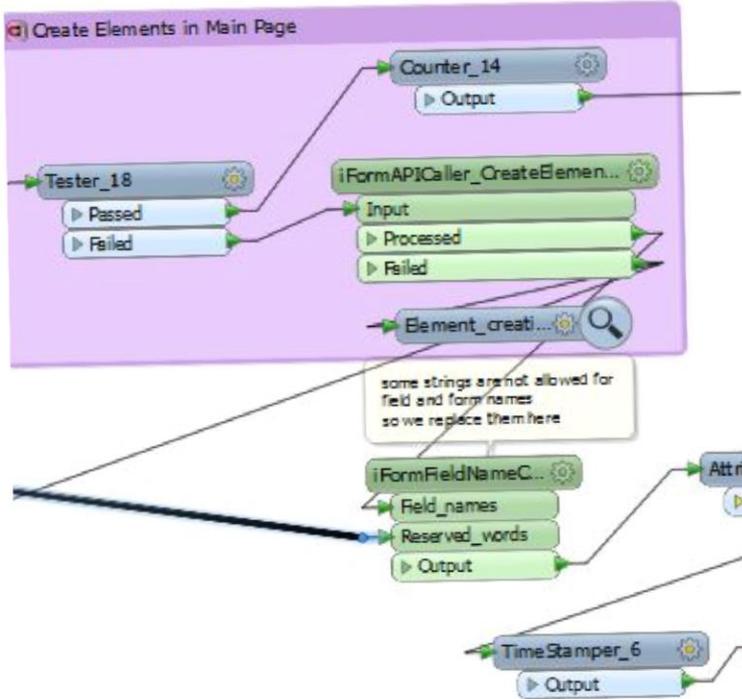
Buttons: Help, Defaults, OK, Cancel

iFormBuilder – FME: Form Cre

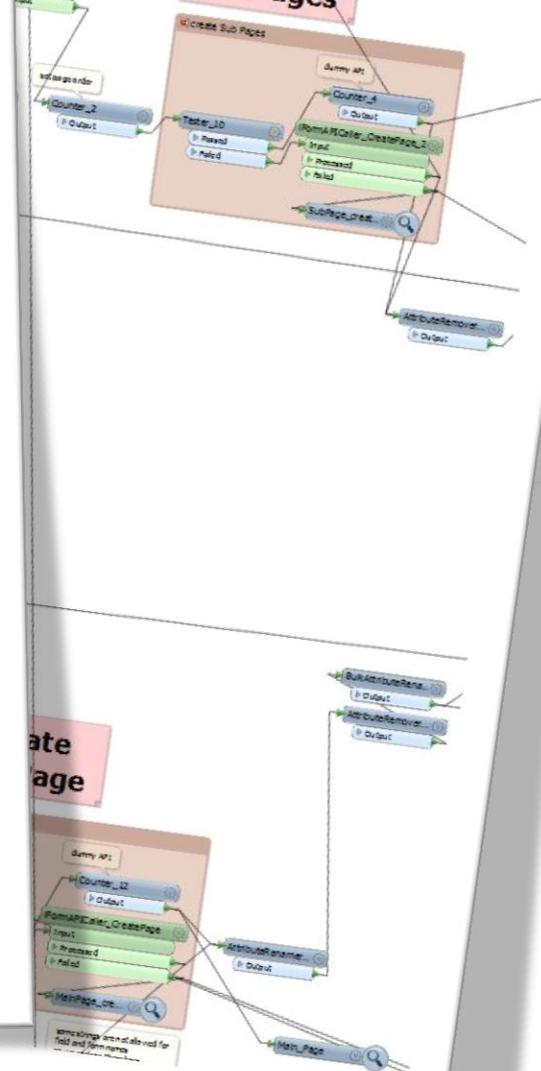
1: Create Pick List



5: Create Main Page Elements

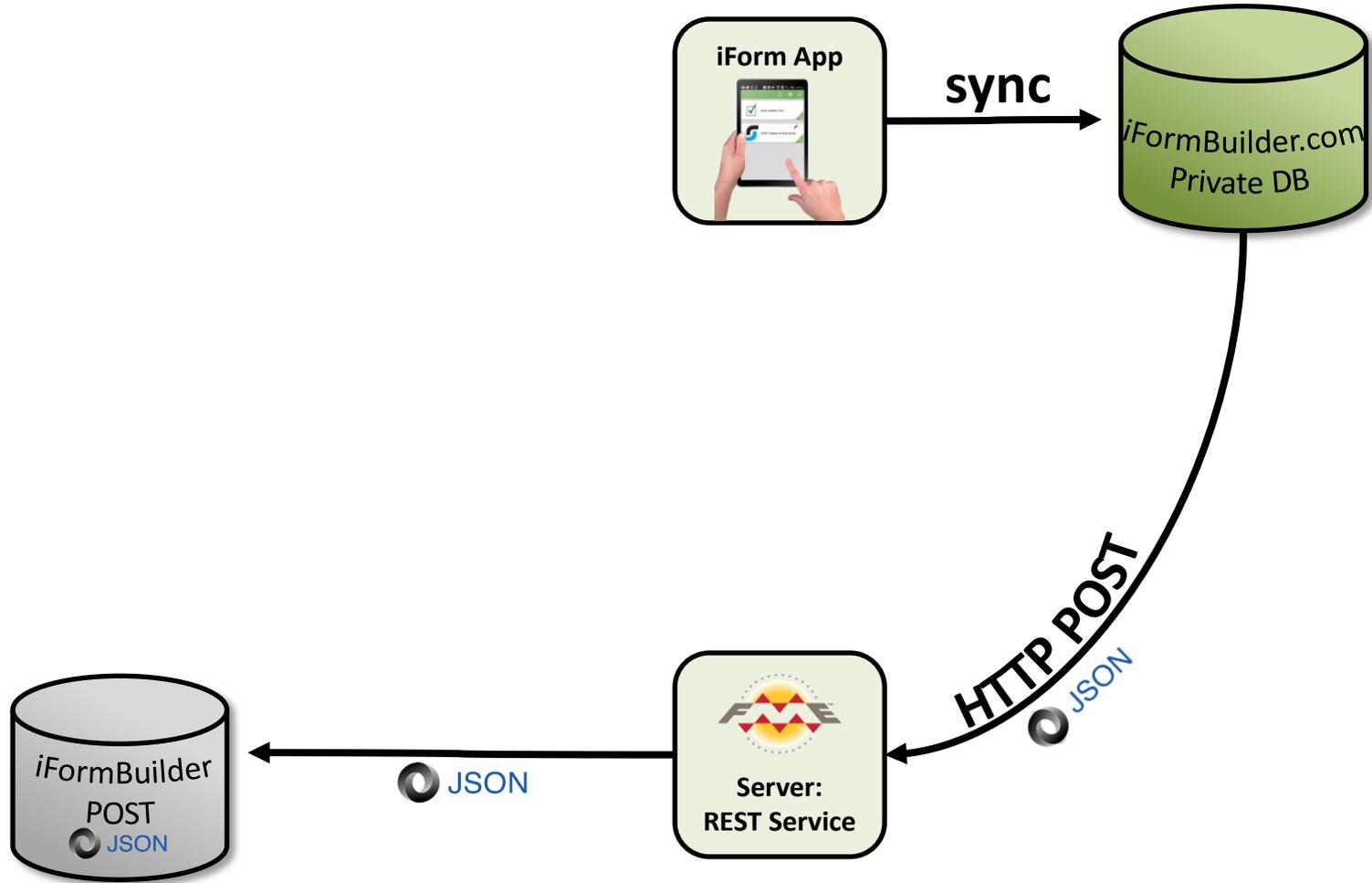


3: Create Sub Pages



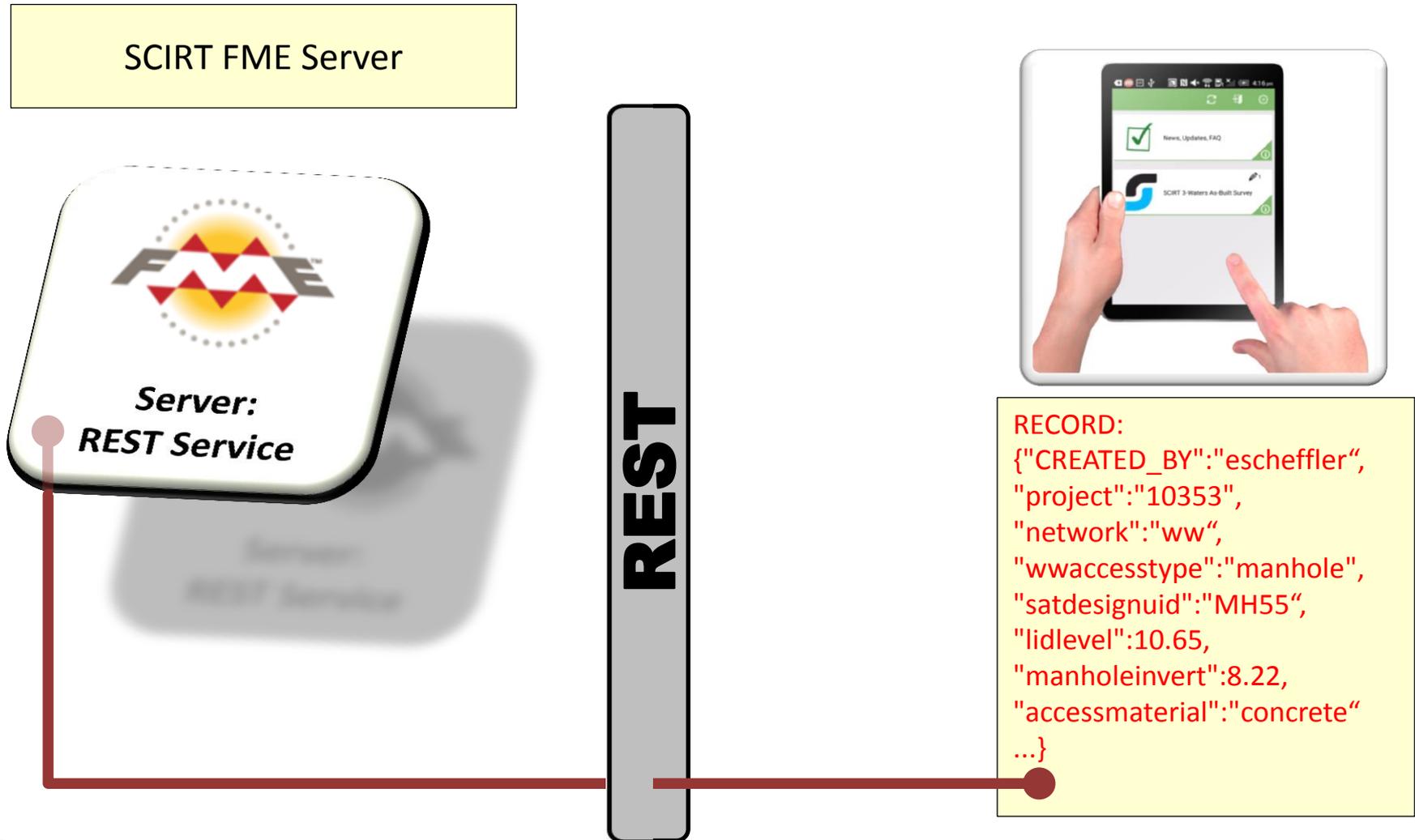
iFormBuilder – Submit to GIS

Ekki Scheffler (ekkehard.scheffler@jacobs.com)



i FormBuilder – Submit to FME Server

Ekki Scheffler (ekkehard.scheffler@jacobs.com)



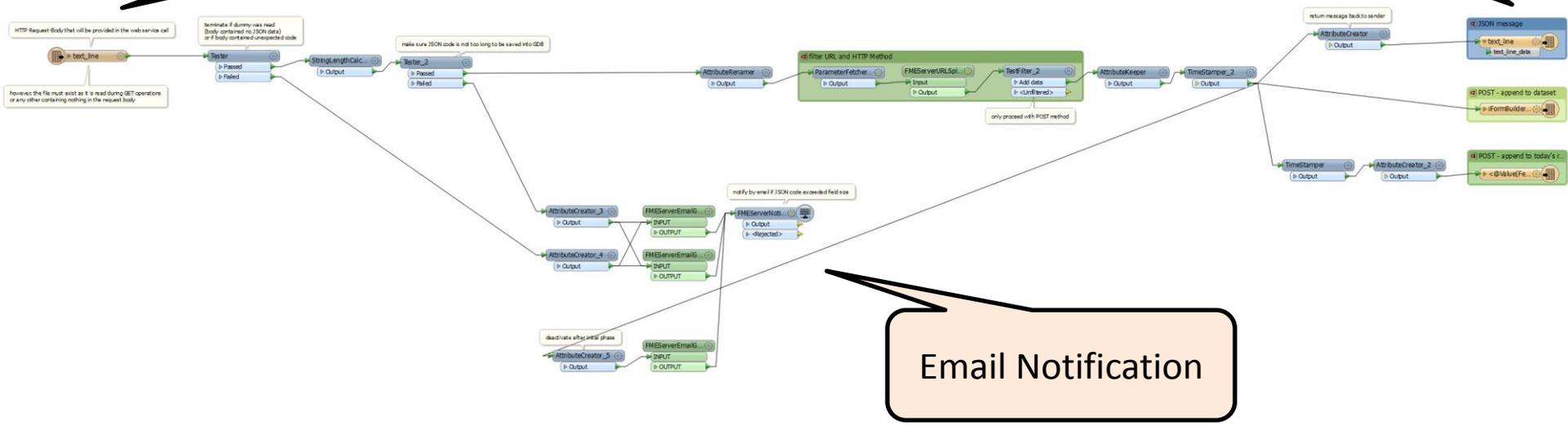
iFormBuilder – Submit to GIS

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iFormBuilder
Receive JSON POST

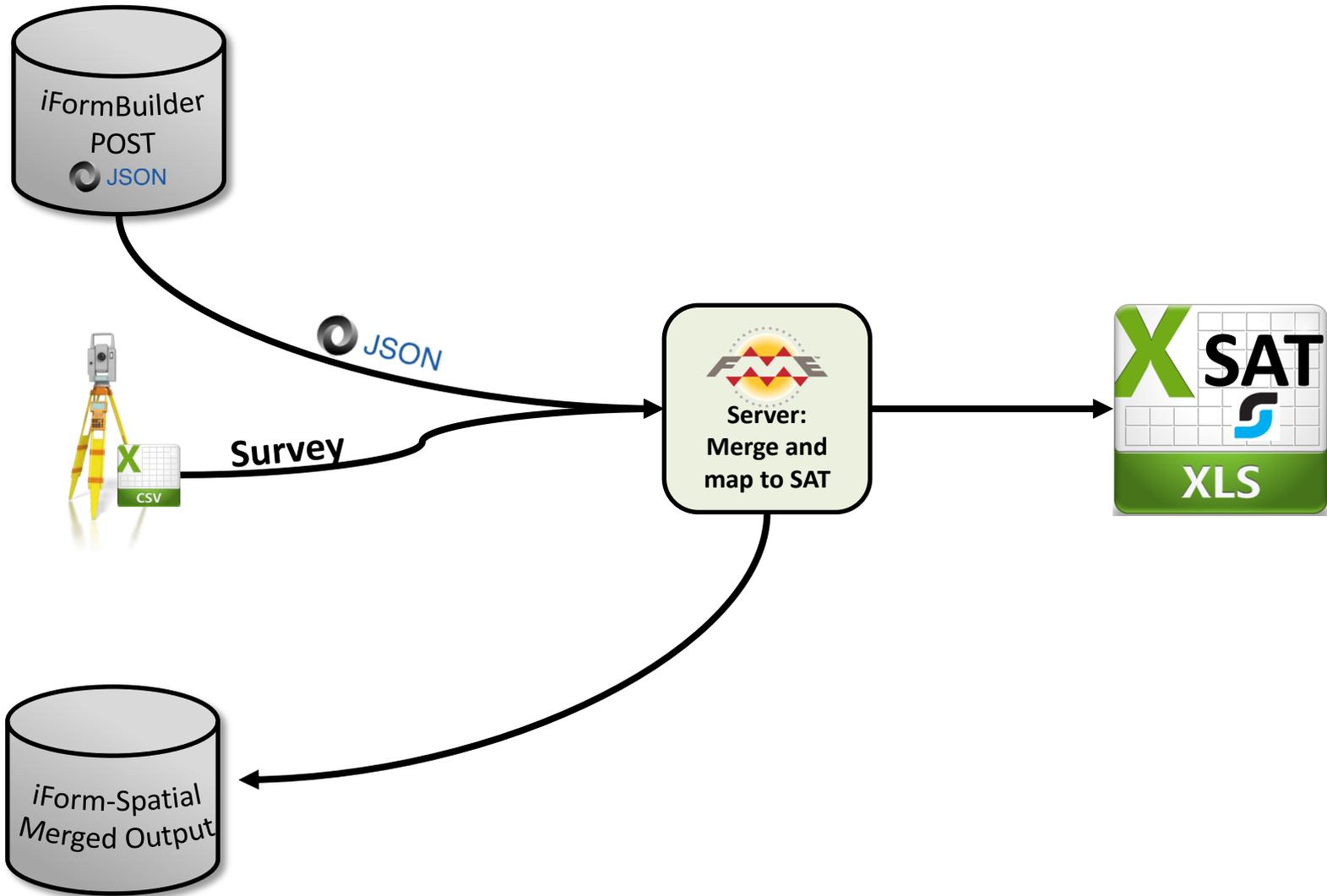
GIS Database
Store JSON



Email Notification

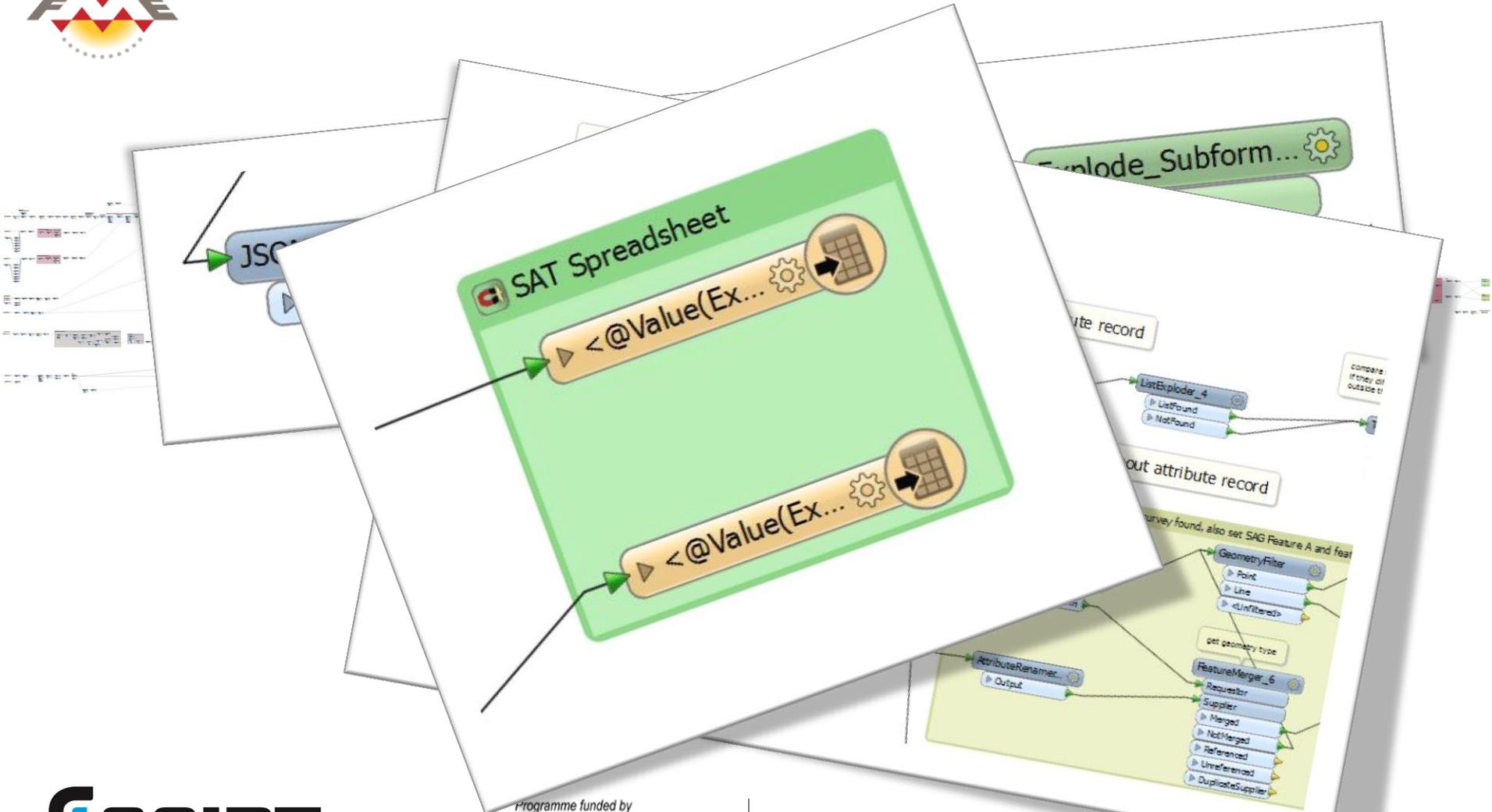
i FormBuilder – Output Data

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iFormBuilder – Output Data

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Programme funded by

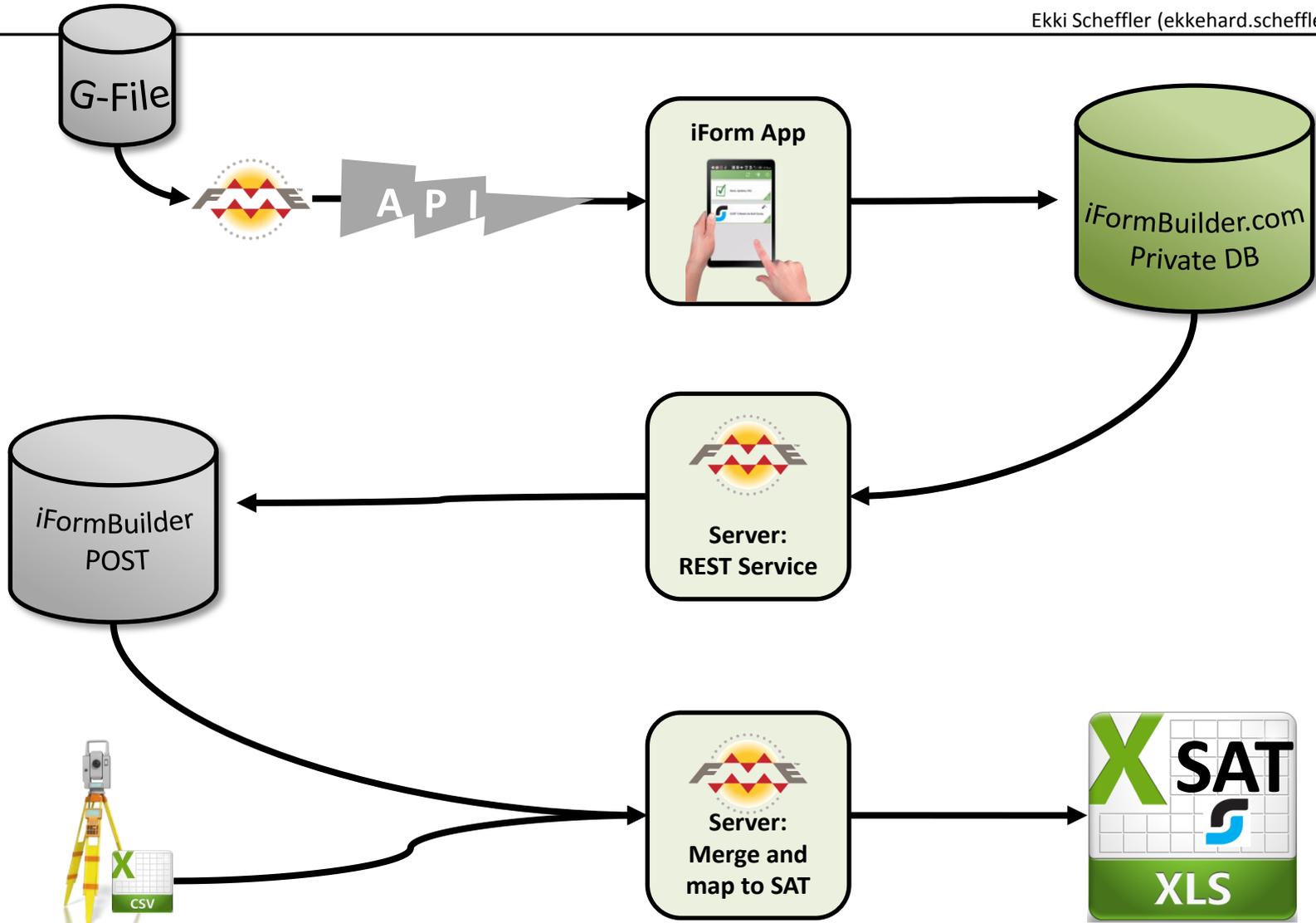


New Zealand Government



iFormBuilder – Summary

Ekki Scheffler (ekkehard.scheffler@jacobs.com)

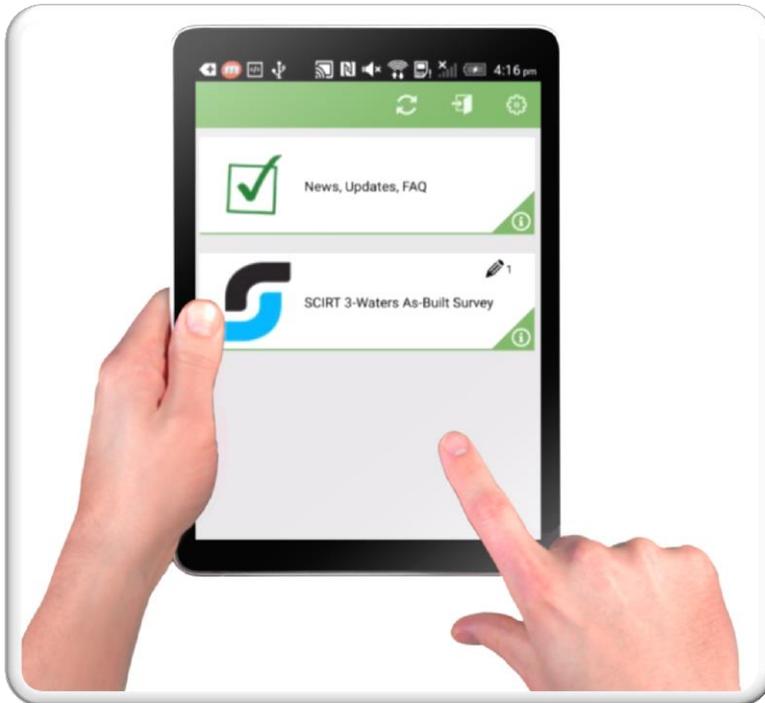


SCIRT's Mobile Apps

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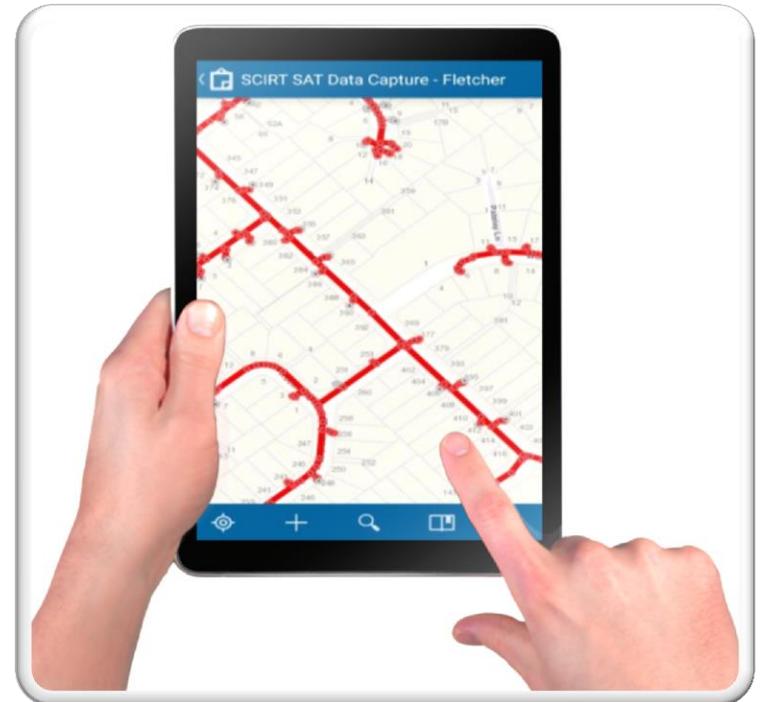
i FormBuilder

On-site attribute collection



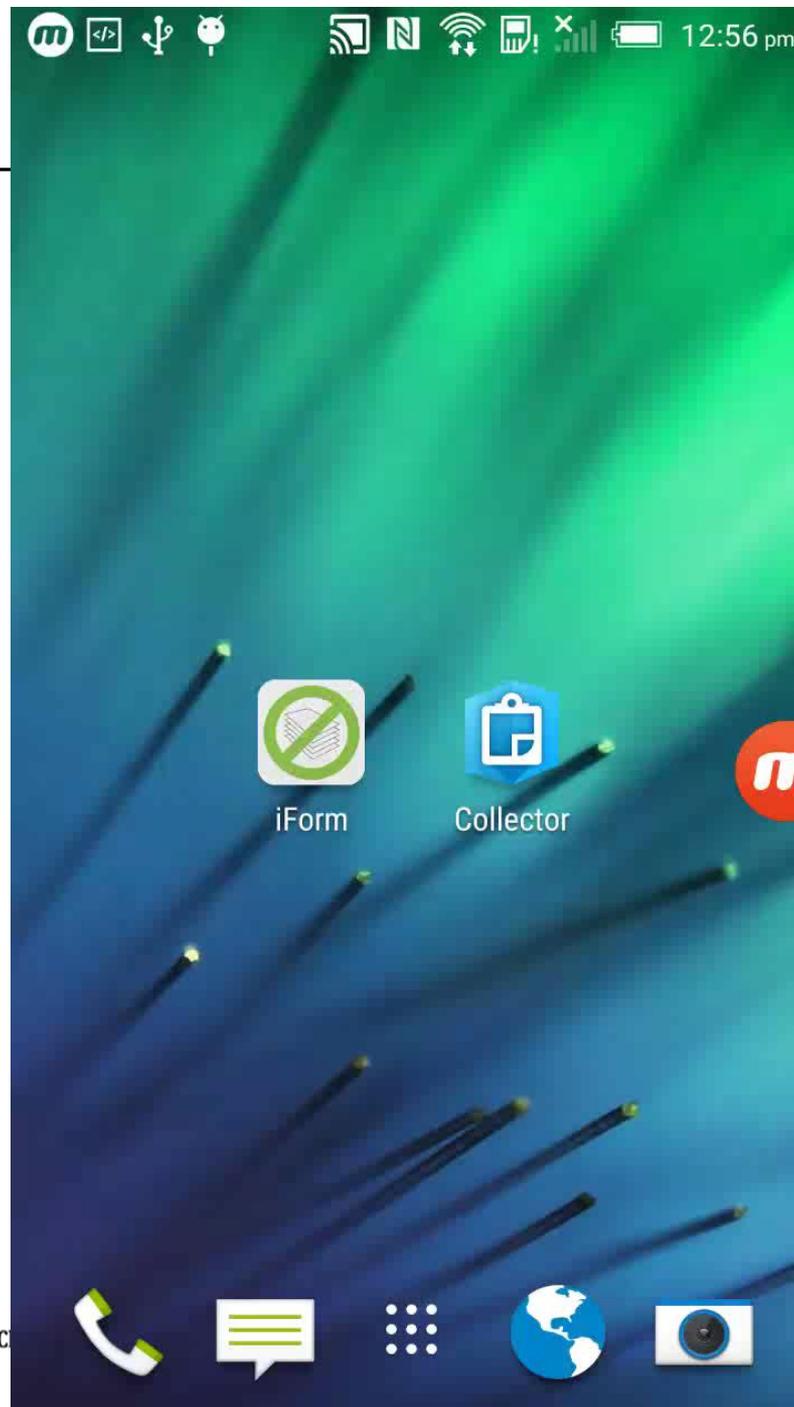
ESRI Collector

Draft data revision



Collector

Ekki Scheffler (ekkehard.scheffler@jacobs.com)

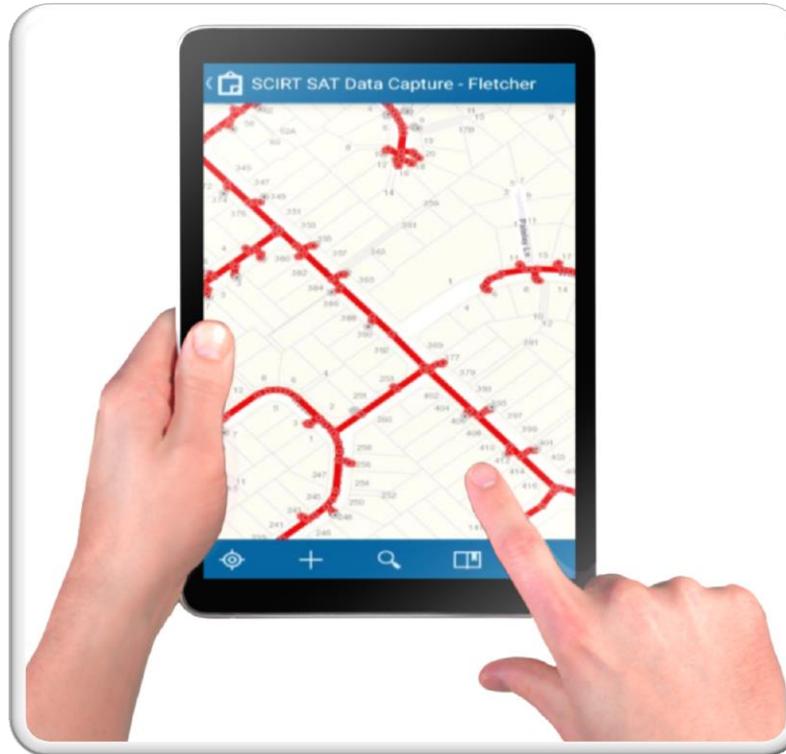


ESRI Collector – what we need

Ekki Scheffler (ekkehard.scheffler@jacobs.com)

Need to create and maintain:

48 Feature Types
with 1000 fields,
650 domain values
in 70 domains



Users must be able to upload independently:

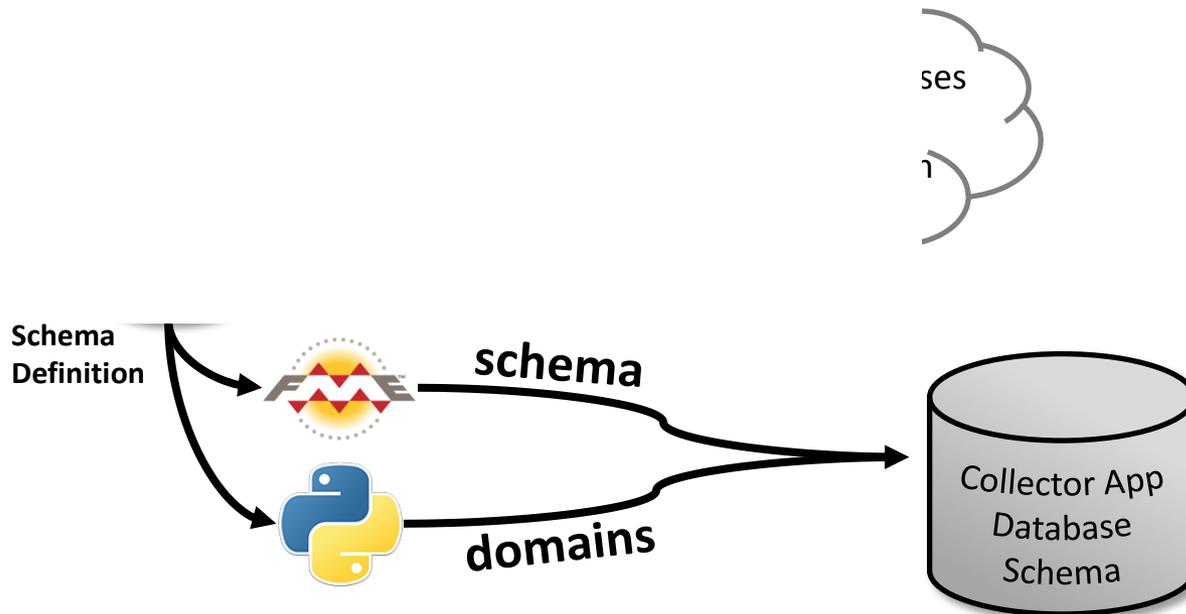
Map schemas
Highlight missing information

Users must be able to download independently:

Map schemas
Delete data from AGOL

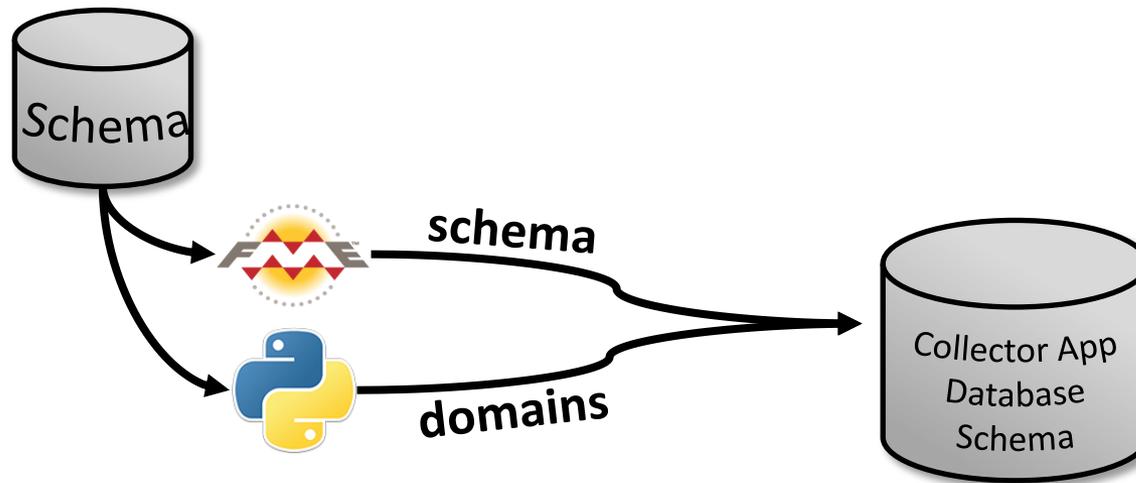
ESRI Collector – Solution

Ekki Scheffler (ekkehard.scheffler@jacobs.com)



Collector – schema creation

Ekki Scheffler (ekkehard.scheffler@jacobs.com)



Collector – schema cre



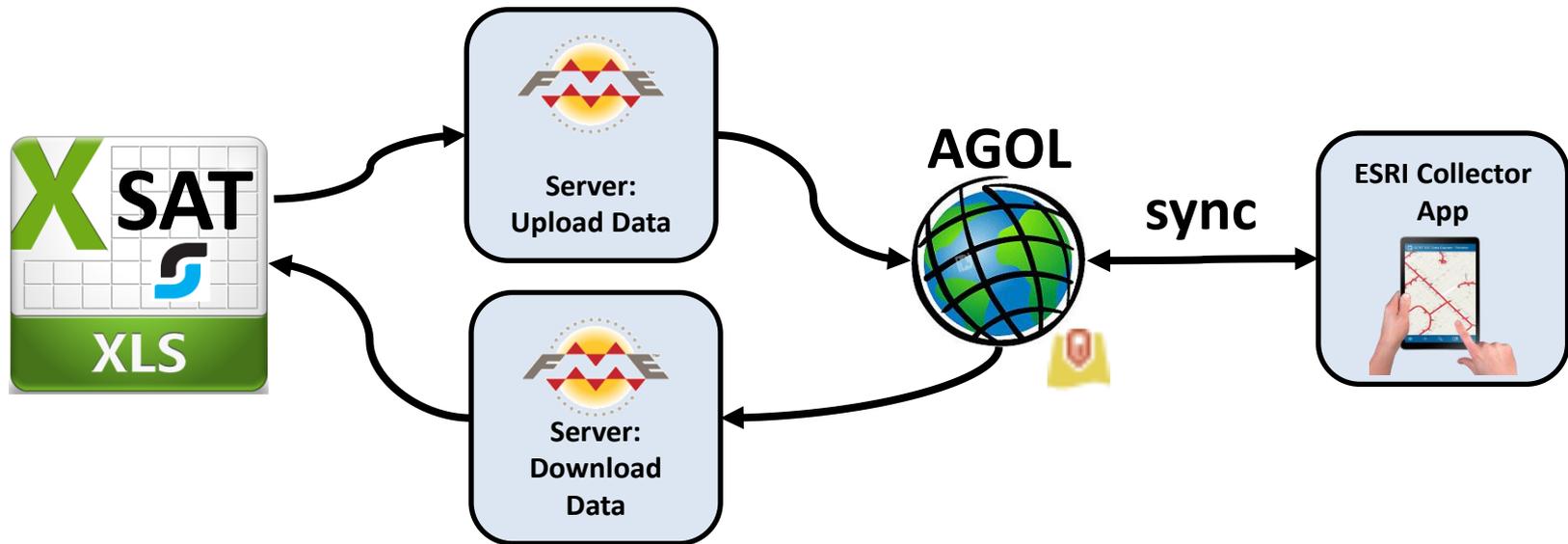
read schema from G-File

schema

```
2
3
4 try:
5     print 'Obtaining Arc license...'
6     import arcpy
7 except:
8     print 'NO ARC LICENSE AVAILABLE'
9     print '\nNo log file created.'
10    raw_input("\n\nPress Enter to close window...")
11    sys.exit()
12
13 # set source tables
14 domainGDB = r'G:\GIS\Asbuilt\Documents\SCIRT Schema\SCIRT_Domains.gdb'
15 schemaGDB = r'G:\GIS\Asbuilt\Documents\SCIRT Schema\Collector_SAI_Schema.gdb'
16 schemaSWFeature = domainGDB + '\\SW_Feature'
17 schemaWSFeature = domainGDB + '\\WS_Feature'
18 schemaWWFeature = domainGDB + '\\WW_Feature'
19 schemaAllFields = domainGDB + '\\All_Fields'
20 logPath = r'G:\GIS\Asbuilt\Documents\SCIRT Schema\Collector_SAI_Schema_process_log.txt'
21 dicAllFields = {} # holds: field name - domain
22 schemaFeatureClasses = {} # holds: feature class - path
23 domainTables = [] # hold names of all domain tables
24 code_field = 'DomainValue' # this is not being used as we work with descriptions only
25 description_field = 'Description'
26 errorcount = 0
27 network = ''
28 log = 'Deleted existing domains GDB "SCIRT_Domains.gdb". Deleted existing schema GDB "Collector_SAI_Schema.gdb".\nCr
29     "SCIRT_Domains.gdb".\nFME processes run to create new schema GDB "Collector_SAI_Schema.gdb".\nCr
30
31 def writeLog():
32     logfile = open(logPath, 'w') # creates or overwrites existing log file
33     logfile.write(log)
34     logfile.close()
35
36 writeLog()
37
38 # make sure the GDBs exist
39 if not os.path.exists(domainGDB):
40     print '\nCannot find "' + domainGDB + '". Process will be terminated.'
41     log += '\nCannot find "' + domainGDB + '". Process will be terminated.'
42     raw_input("\n\nPress Enter to close window...")
43     writeLog()
44     sys.exit()
45
46 if not os.path.exists(schemaGDB):
47     print '\nCannot find "' + schemaGDB + '". Process will be terminated.'
48     log += '\nCannot find "' + schemaGDB + '". Process will be terminated.'
49     raw_input("\n\nPress Enter to close window...")
50     writeLog()
51     sys.exit()
52
53 print '\nCollecting list of fields and associated domains...'
54 log += '\nCollecting list of fields and associated domains...'
55 # get table of all fields with associated domains
56 try:
57     tableAllFields = arcpy.SearchCursor(schemaAllFields)
58 except:
59     print 'The table at "' + schemaAllFields + '" could not be found. Terminating process.'
```

Collector – user interaction

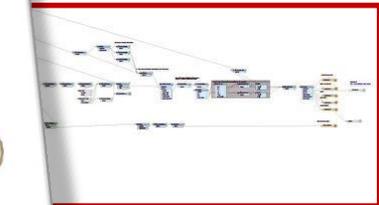
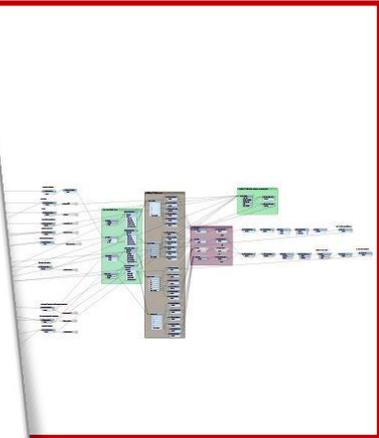
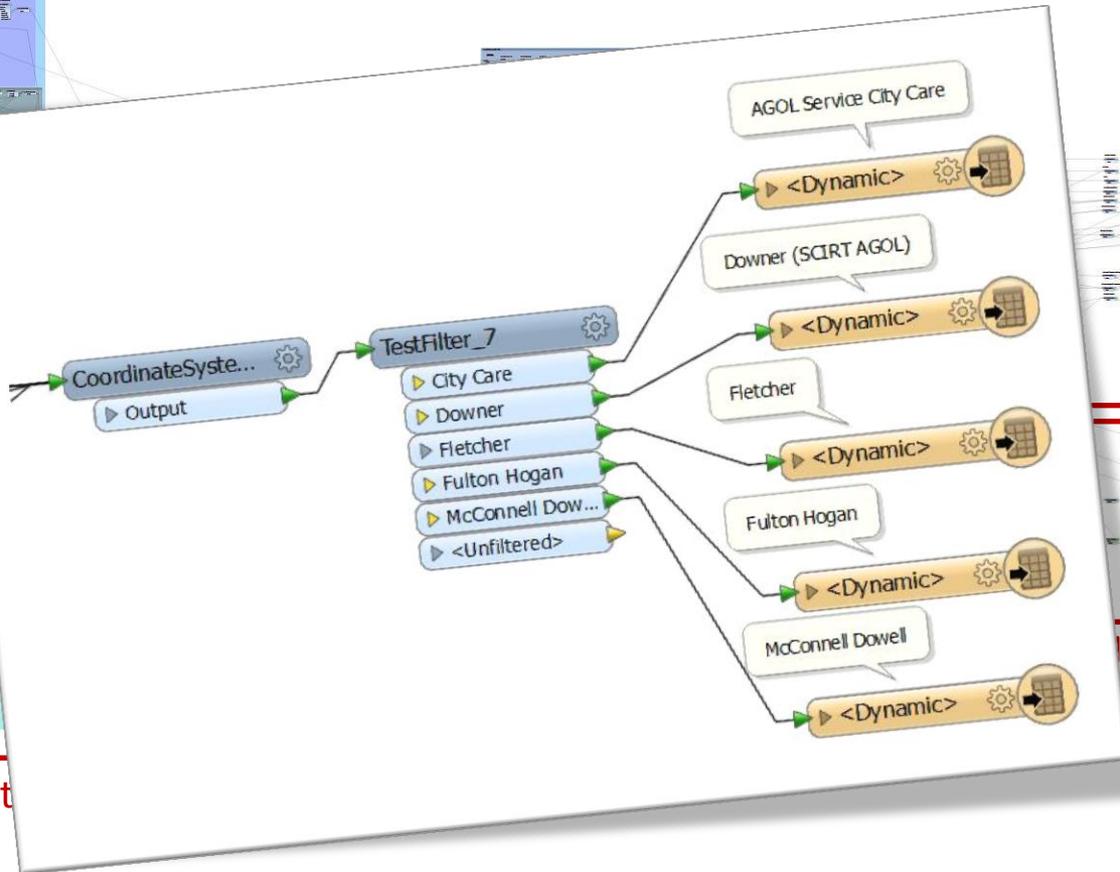
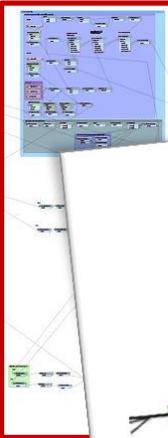
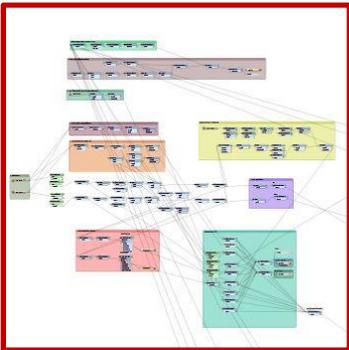
Ekki Scheffler (ekkehard.scheffler@jacobs.com)



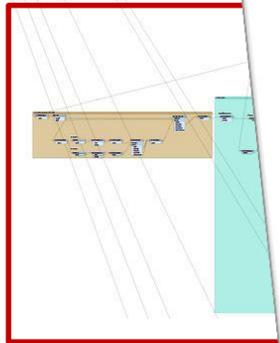
Collector – FME Server data upload

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Check for missing information and tag incomplete records



Read SAT (Excel)
and check



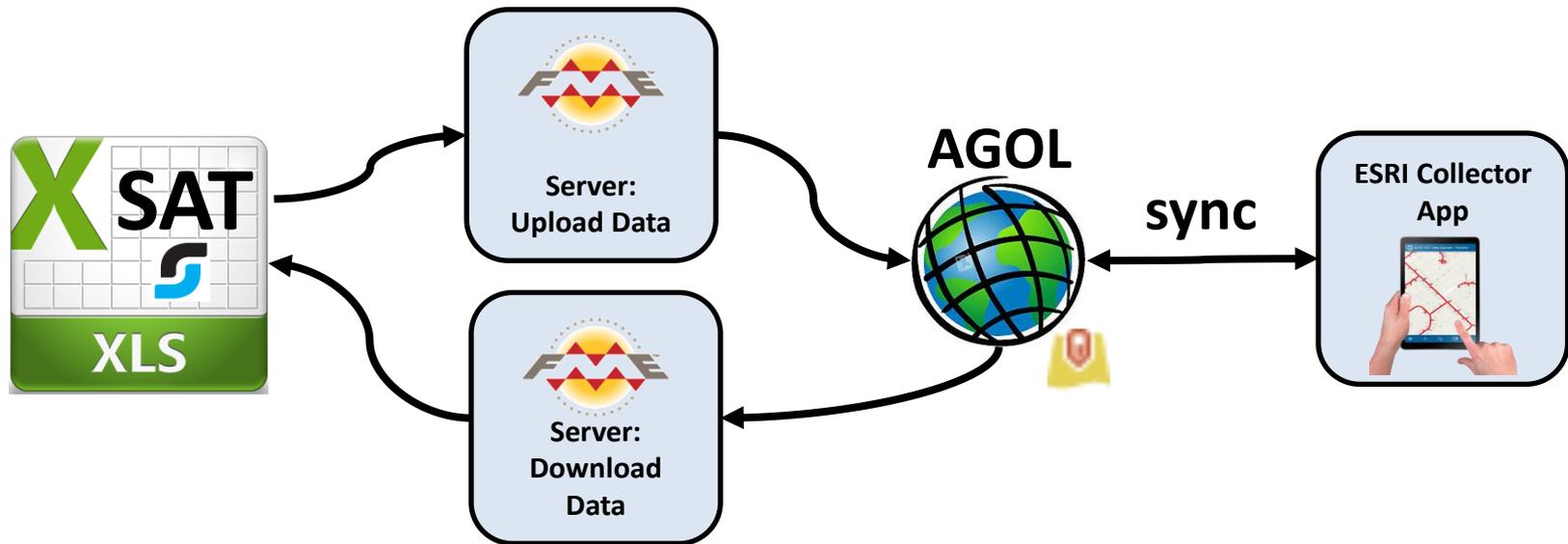
Create geomet

Map schemas and
write data to AGOL



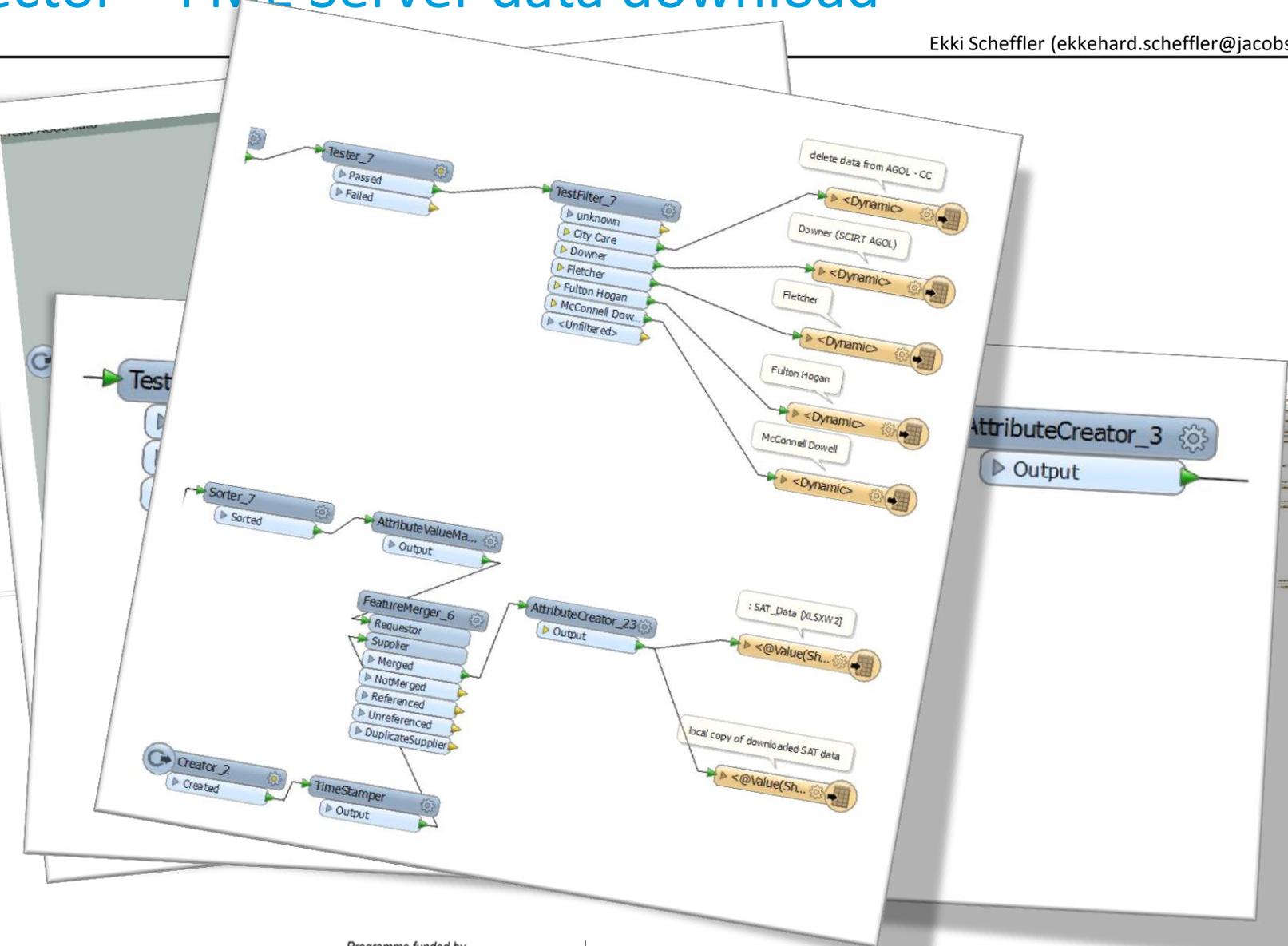
Collector – user interaction

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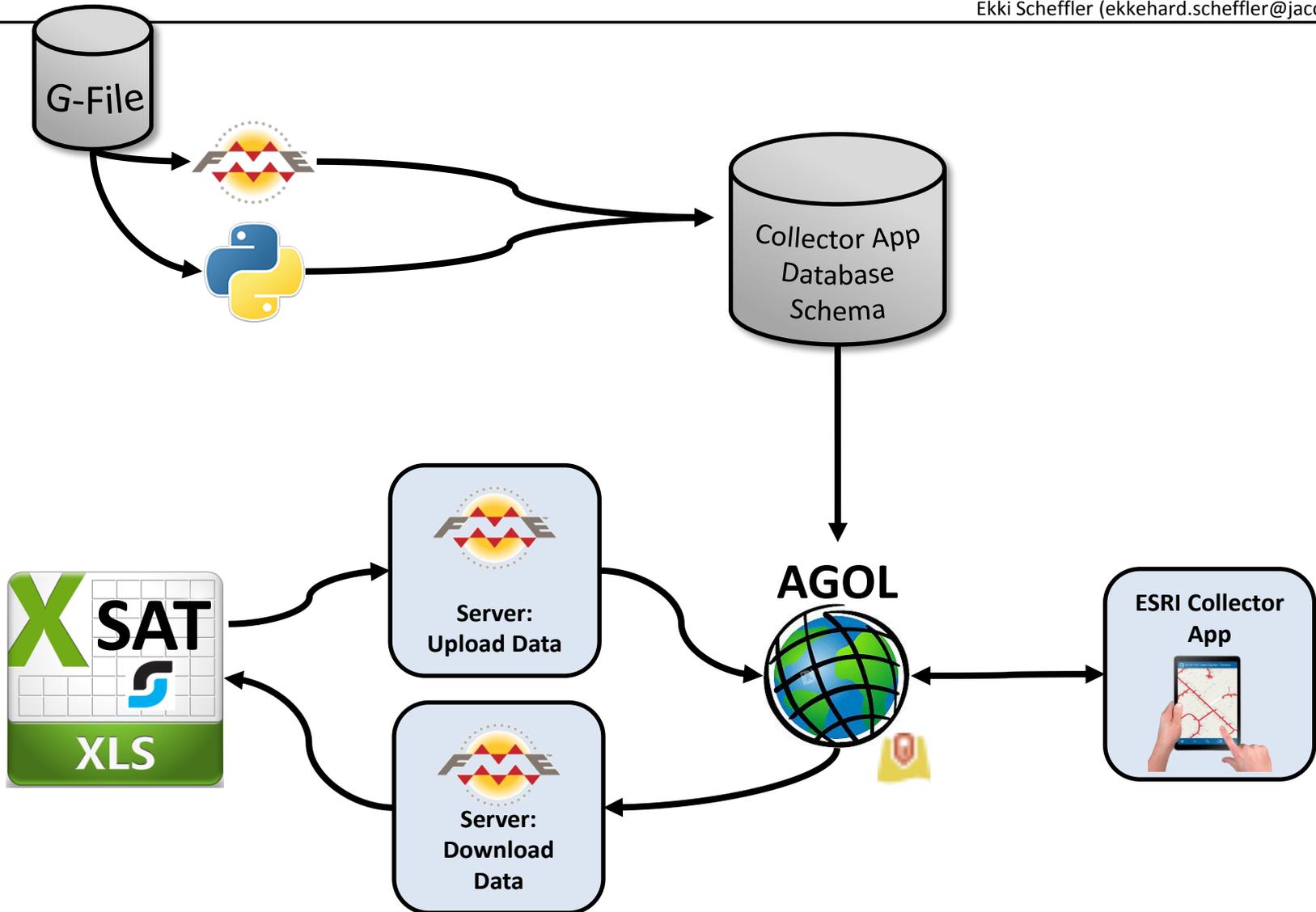
Collector – FME Server data download

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ESRI Collector – Summary

Ekki Scheffler (ekkehard.scheffler@jacobs.com)



Questions?

Comments?



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