

INDOT's Transition to OpenGround

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Sequence of Presentation

- Introduction
- INDOT Geotechnical Engineering Workflow based on gINT
- Alternatives to gINT
- OpenGround Introduction, Transitioning and Customization
- Conclusion

Introduction



gINT Professional Plus
CONNECT Edition

Geotechnical Industry
standard for managing
and reporting
Geotechnical soil
investigation data.

Launched in 1986 by
Salvatore Caronna as an
MS DOS based application
and then migrated to
windows platform

Acquired by Bentley in
2009.

Used in most of the USA
and all over the world

INDOT has been using it
since early 2000

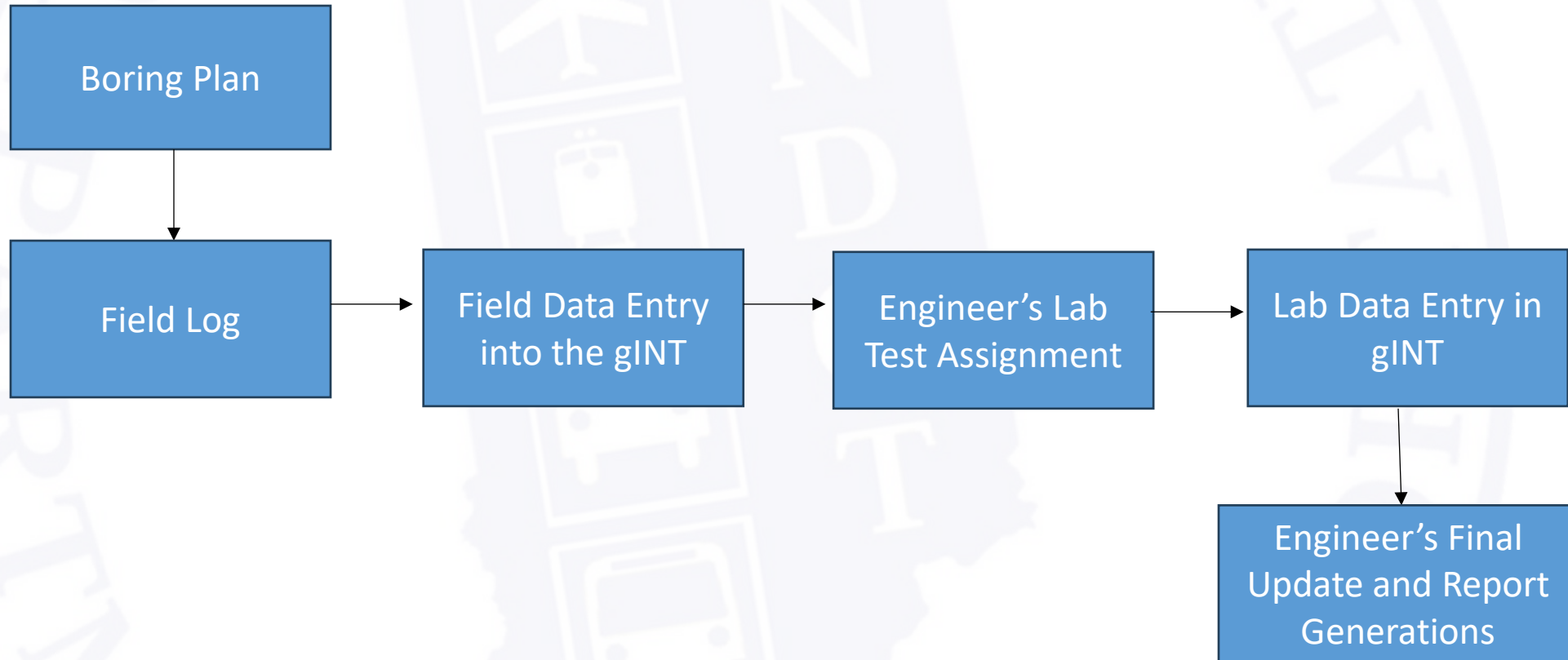
Very flexible software

- Standalone and Enterprise Versions
- You could do anything in this software.

Can export data in
different format

Report generation

High Level Work Flow.



Timeline based on Emails received from Bentley

“Effective January 1, 2023, you will continue to have 12 months of your usual product support. We will be working diligently to implement priority gINT workflows and assist you in migrating to our OpenGround platform. “

“Beginning January 1, 2024, gINT will enter Expiring Support status. This means, for the following 24 months, you can continue to make routine service requests, access software downloads, and receive critical security software updates.” Software will be available but there will be no routine updates.

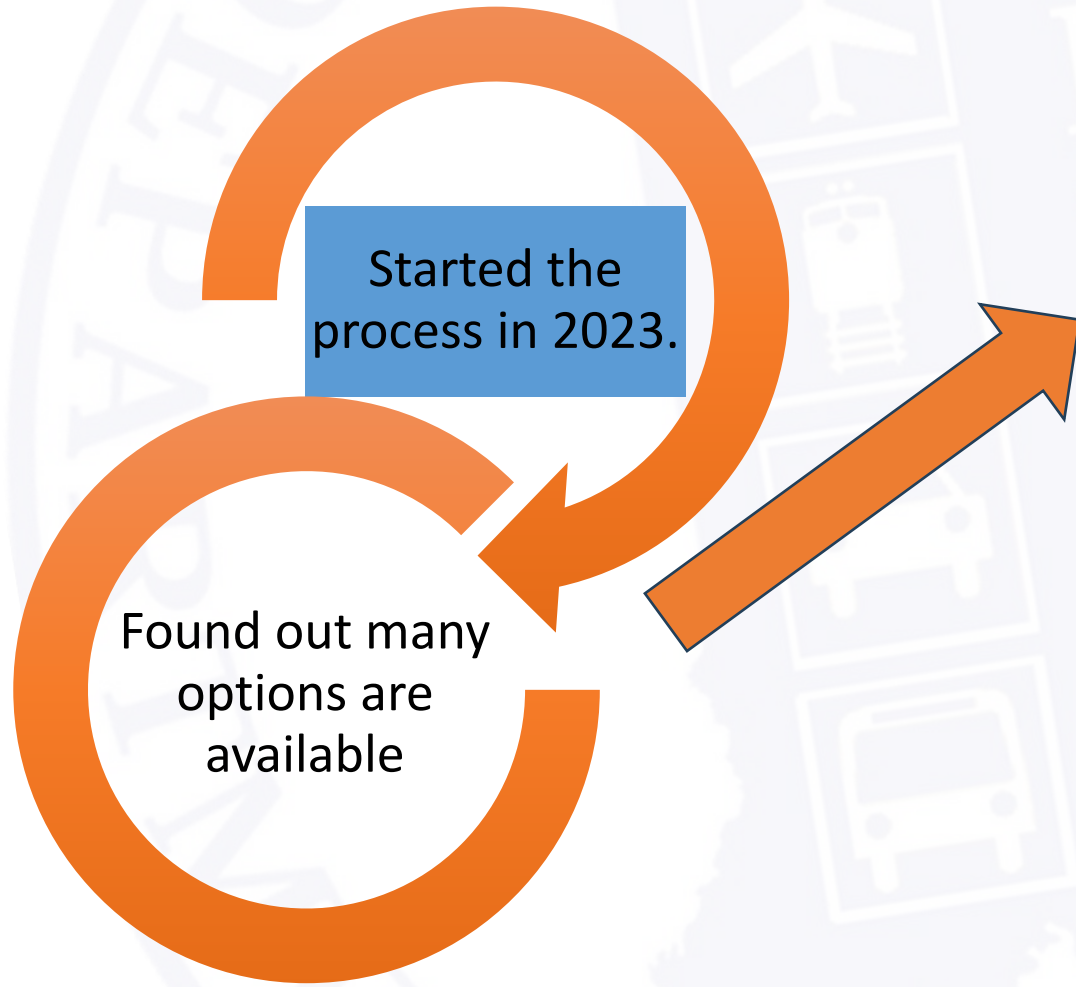
“Finally, end of 2026, gINT will enter Support Discontinued status, at which point you can continue to use the product but will receive no further support or updates.” (initial decision was January 2026)

Current Timeline,

- <https://www.seequent.com/help-support/gint-migration-openground/#timeline>

	Expiring Support				Discontinued Support
gINT Sales	2025	2026	2027	2028	2029
Available on E365/EPS contracts	✓	✓	✓	✓	No
New SELECT perpetual licenses (including first-year annual Support and Maintenance)	✓	Existing gINT Accounts Only	Existing gINT Accounts Only	No	No
SELECT Support and Maintenance annual contracts SELECT Pre-Paid Annual subscriptions	✓	Existing gINT Accounts Only	Existing gINT Accounts Only	Existing gINT Accounts Only. End date must not exceed 31 Dec 2028 (sub-annual terms possible)	No
Virtuoso annual subscriptions	✓	Existing gINT Accounts Only	Existing gINT Accounts Only	No	No
gINT Support	2025	2026	2027	2028	2029
Online, email, and telephone support available	✓	✓	✓	✓	No
Online learning and support materials available	✓	✓	✓	✓	✓
gINT Updates	2025	2026	2027	2028	2029
Critical bug fixes	✓	✓	Reasonable Endeavour	Reasonable Endeavour	No
Security updates	✓	✓	Reasonable Endeavour	Reasonable Endeavour	No

Options



Software

OpenGround



RSLog



BoreDM



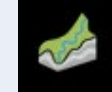
EQulS Geotech



TabLogs



GeoDin



GEO5



BLogPro



LOGitEASY



Options

OpenGround		Seequent/Bentley
RSLog		RockScience
BoreDM		BoreDM
EQuIS Geotech		EarthSoft

Our Current Understanding

	OpenGround	BoreDM	RSLog	EQuIS Geotch
Platform	Cloud-Based	Web-based with cloud storage	Web based	Web based
Data entry	Field + Office	Field + office	Field + office	Field + office
Project Planning	Online	Online	Online	Online
Borehole Logging	Included (CPT limited)	Included (CPT Beta)	Included	Included
CPT support	Included through support team	Will be included	Included	Included
Lab Data Management	Only Results can be entered	Beta Testing	Relatively better has custom options	Relatively better
Report Generation	Yes (Templates Studio). At moment no report from multiple borings	Yes, Lab reports still in progress	Yes.	Yes, better than other.
Historical Data	Was not clear at that time. Now we have better idea.	Limited. Import basic information from gINT. Can attach documents.	Can import gINT files. Claim will have support for semi-structure data soon	Can import gINT files. Can attach scanned copy of a project.
Data Export	Various	Various	Various	Various

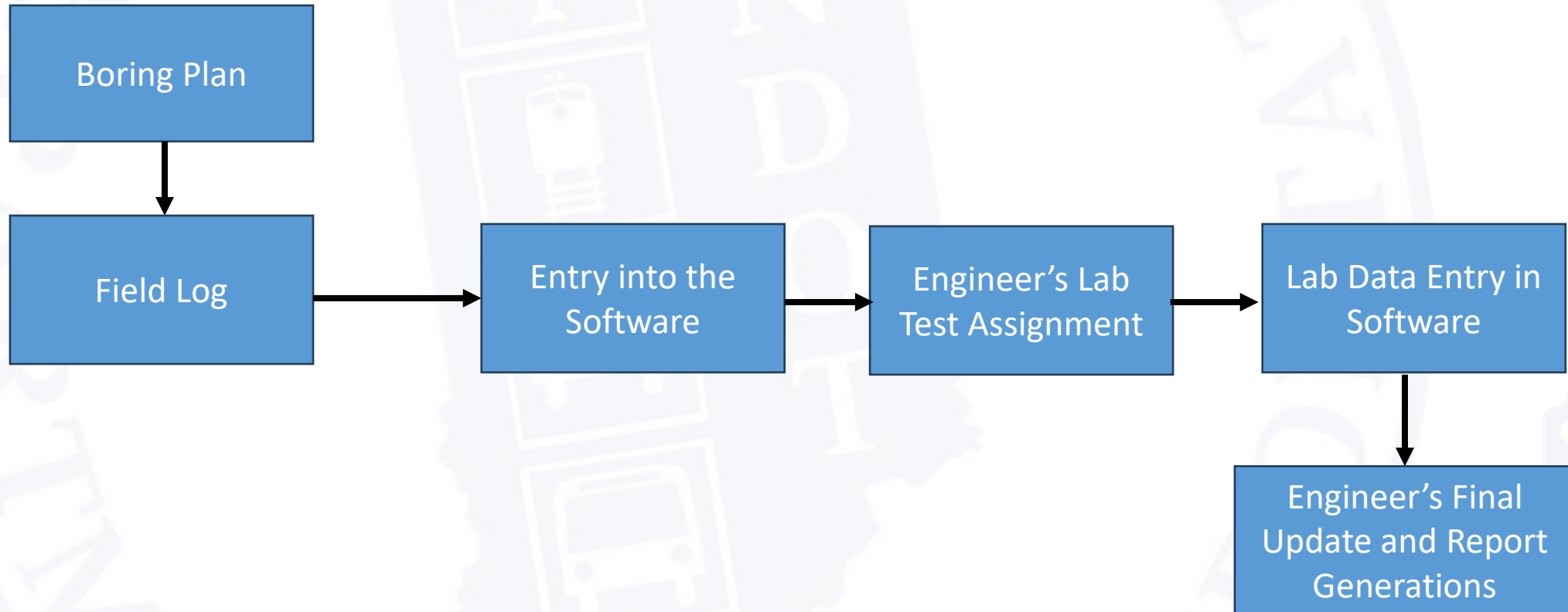
INDOT Migration Survey

- Pretty much all the software based on their presentation could fulfill INDOT objectives
- Conducted an email survey from different Midwest states and received 8 responses
- Selected OpenGround and BoreDM based on responses
- We also got responses from Consultants. Most of them hadn't chosen any option by then. Only S&ME started using OpenGround.
- We evaluated BoreDM trial version
- Final option: OpenGround was chosen

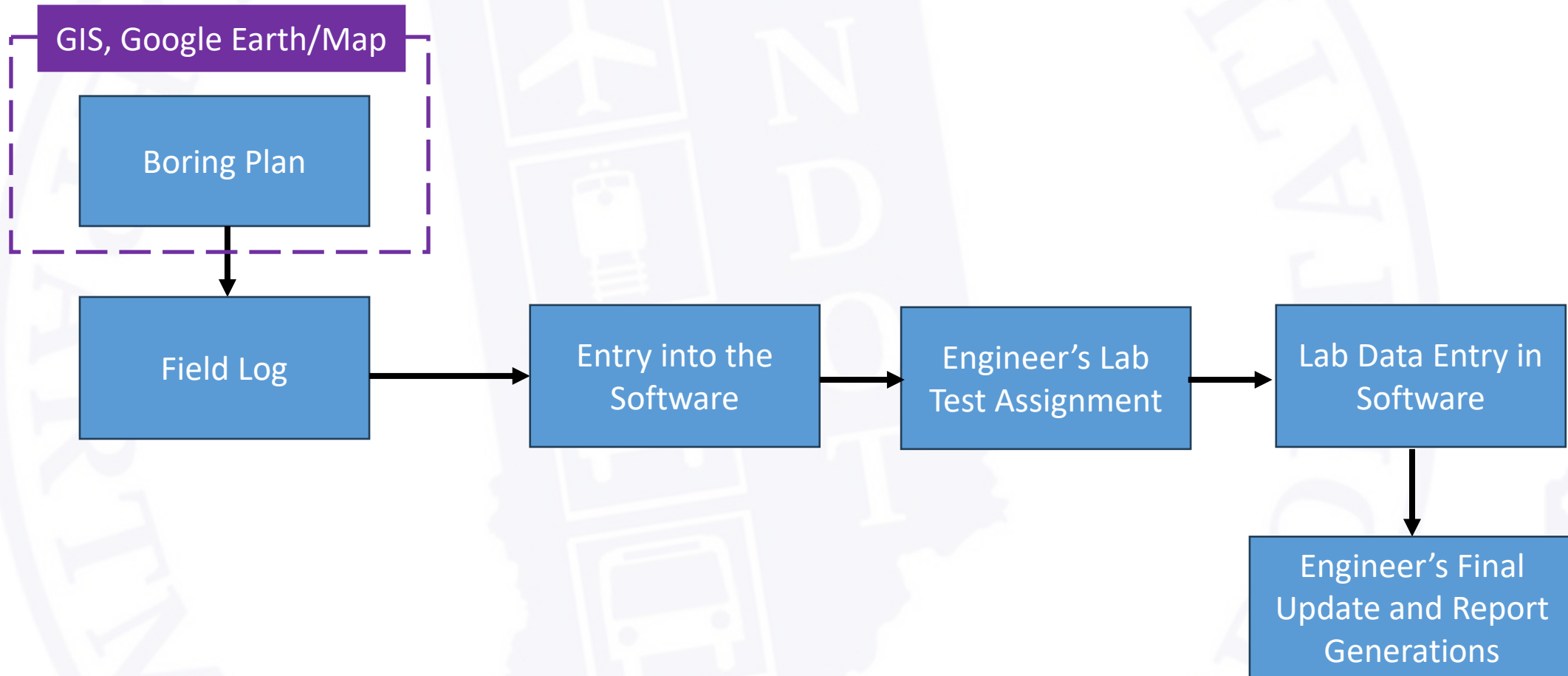
Migration Process

- We provided our gINT outputs to Bentley.
- We had meetings with Bentley to provide them what we want.
- They customized some of the reports. However, We at our end are doing the rest of customization.

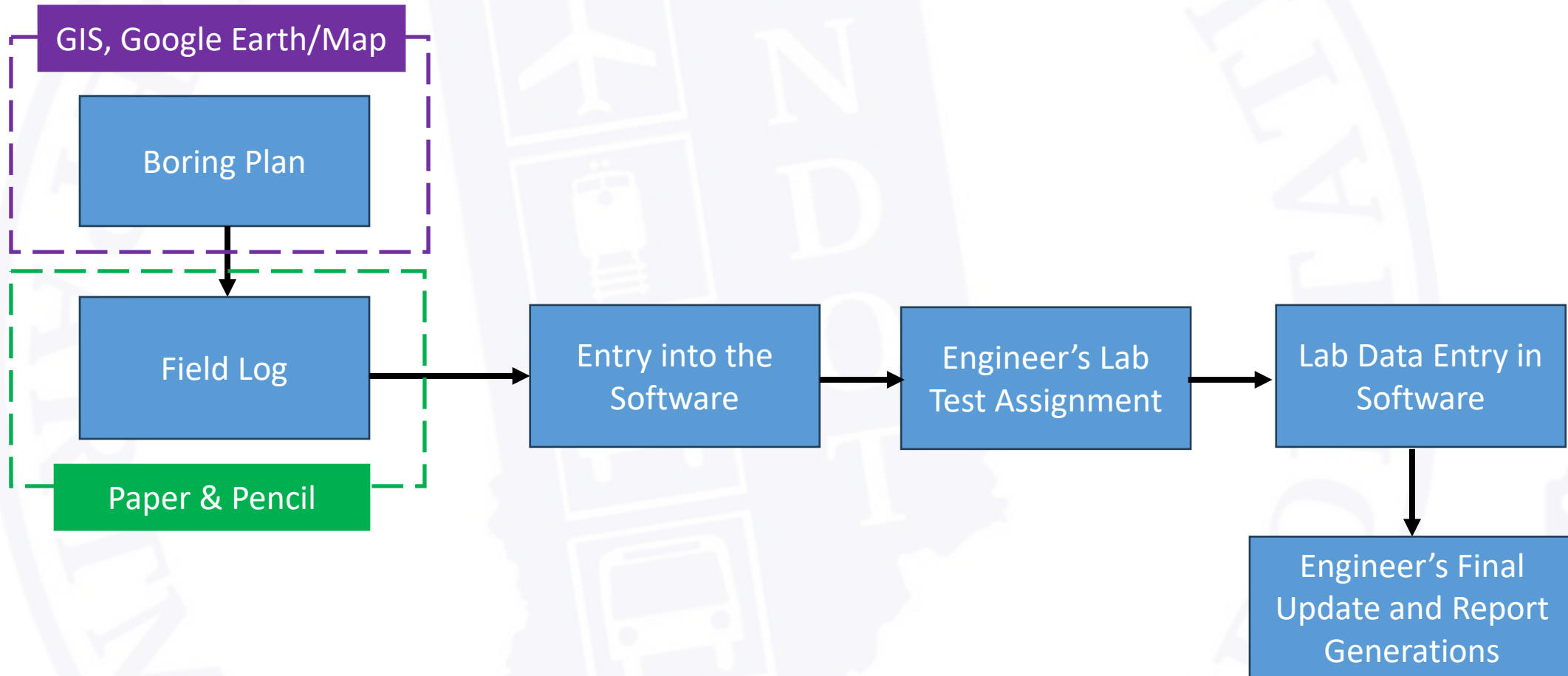
Process Flow of Geotech Investigation



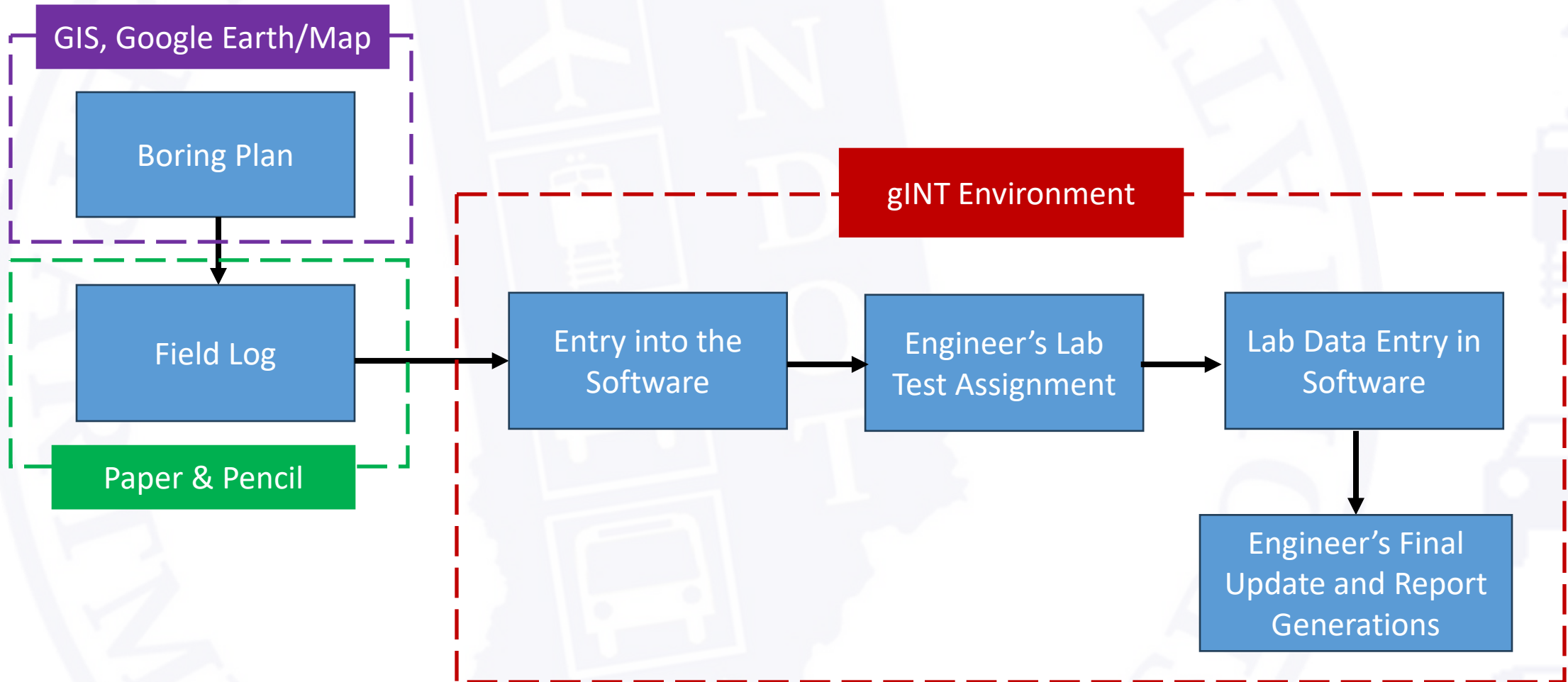
Current Process Flow with gINT



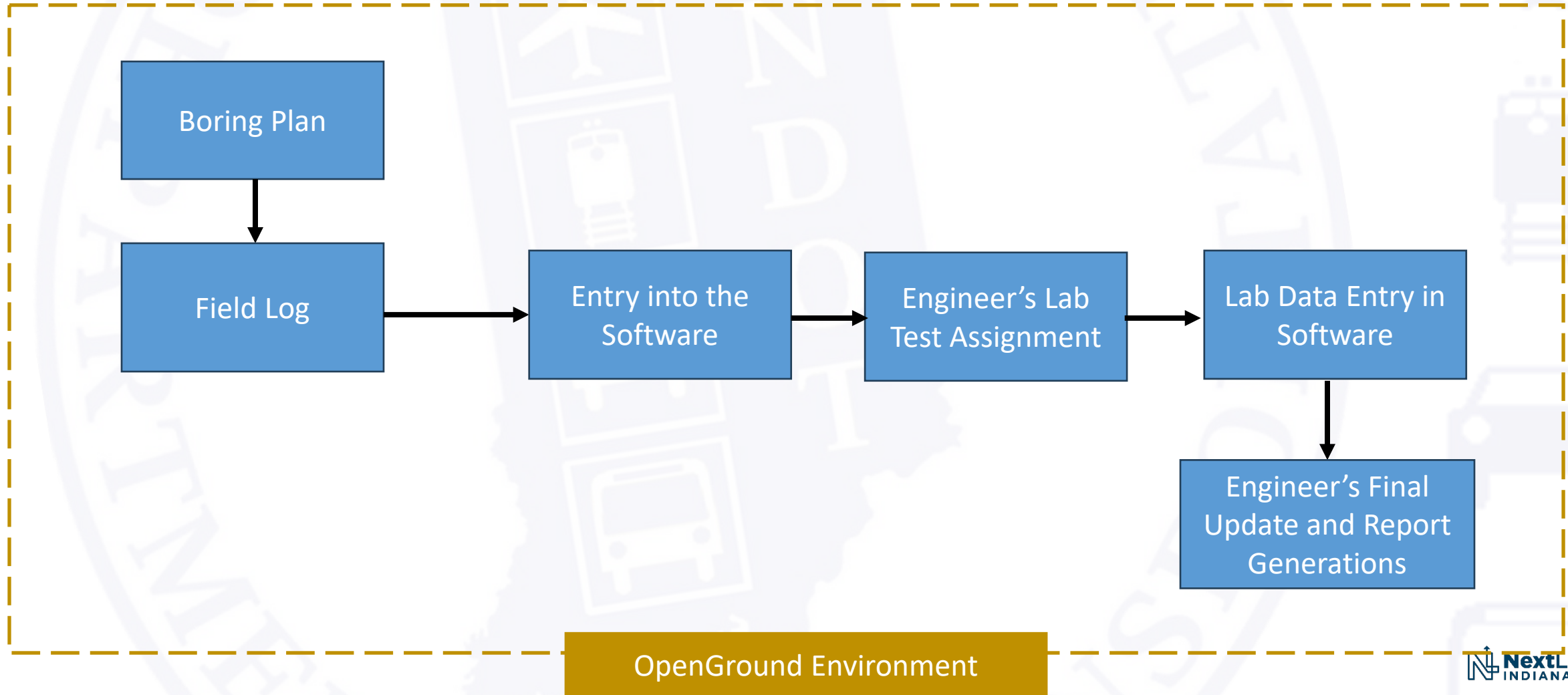
Current Process Flow with gINT



Current Process Flow with gINT



Initial Thought on OpenGround



Received Product (OpenGround)

- We had 7 training sessions (1 to 1.5 hours long)
 - Introduction to OpenGround
 - How to use the software
 - How to use field data logger
 - How to customize the software

The screenshot displays the OpenGround web application interface. The top navigation bar is dark blue with the 'OpenGround' logo on the left and a user menu on the right containing options like 'INDOTOpenGround', a refresh icon, a globe icon, a help icon, a user profile icon, and a close icon. Below the navigation bar, the main content area is divided into two columns. The left column, titled 'Installed Apps', lists five applications: 'Portal' (Latest, with a 'Release Notes' link and an 'OPEN' button), 'Professional' (v10.0.1.3056, with a 'Release Notes' link and a 'LAUNCH' button), 'Excel Extension' (v10.0.1.1828, with a 'Release Notes' link and a 'LAUNCH' button), 'Data Entry' (v10.0.1.3056, with a 'Release Notes' link and a 'LAUNCH' button), and 'Template Studio' (v10.0.1.2512, with a 'Release Notes' link and a 'LAUNCH' button). The right column, titled 'Latest News', features three news items: 'Editable Quick Section Templates in Template Studio' (dated Thursday, July 3, 2025, with a 'READ MORE' link), 'Bridging the gap between geotechnical and civil design: From OpenGround to OpenRoads' (dated Wednesday, April 16, 2025, with a 'READ MORE' link), and 'Review Your Data Directly in the Field with the New Quick View for Collector!' (dated Wednesday, March 26, 2025, with a 'READ MORE' link). Below these, there are two more news items: 'OpenGround Geotechnical Extension for Bentley Open Applications, 2024 is now available!' (dated Monday, December 9, 2024, with a 'READ MORE' link) and 'Mandatory Critical Updates of OpenGround Applications' (dated Wednesday, November 27, 2024, with a 'READ MORE' link). At the bottom of the page, a footer contains the copyright notice: '@ 2024 Bentley Systems, Incorporated | Terms of Service | Privacy | Terms of Use | Cookies | Legal Notices | Attributions'.

Users' Levels

- Structure of OpenGround from User's Point of View

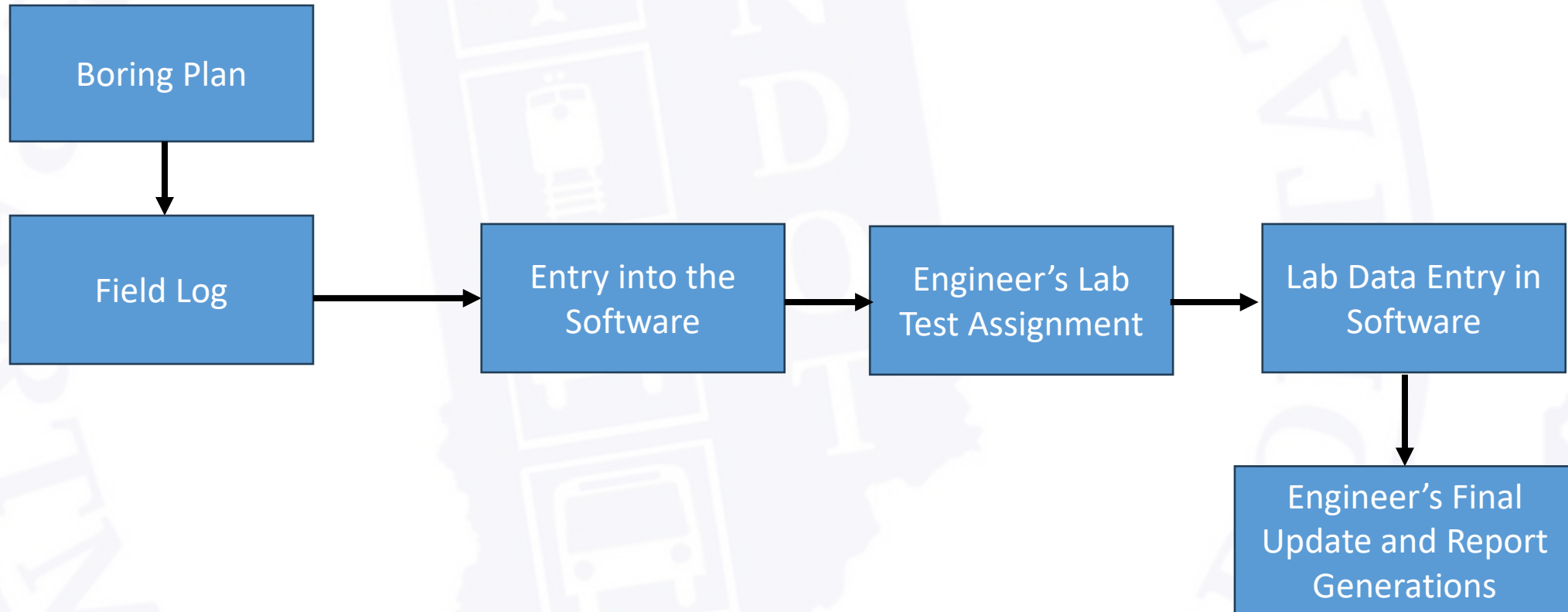
- Admin Level

- Configuration Pack (Based on relational database with sql at the background). You can find different tables and the field in these table.
 - Template (use to generate reports, graphs etc)
 - User Management

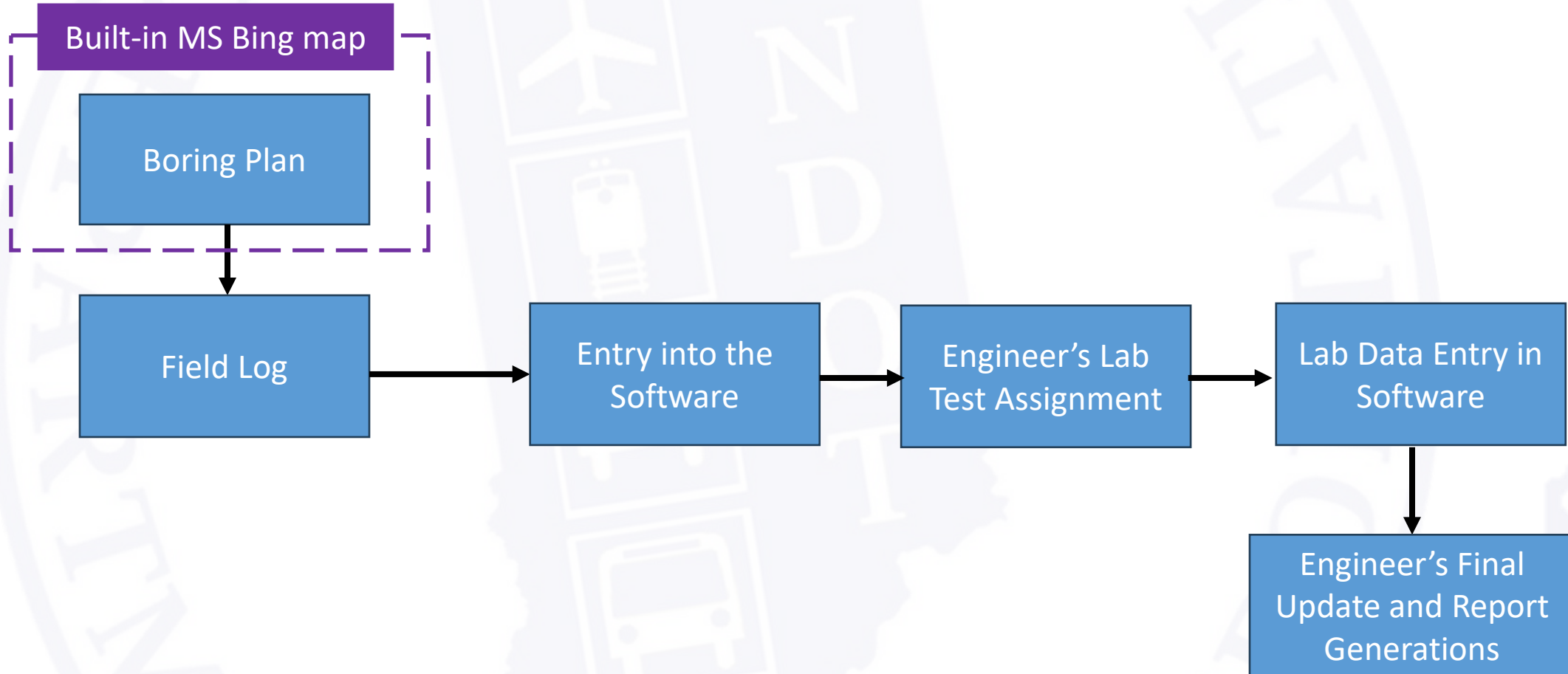
- User Level

- Project Creation
 - Data Entry
 - View Only

Process Flow of Geotech Investigation



OpenGround Capability



Boring Plan

System

Mapping

Preferences

Help

Map Tools

Open Project

Toggle Legend

Refresh Map

Initial extents

Zoom in

Zoom out

Rectangle

Coordinate

Place

Pan and Tooltip

Select

Clear

Set Initial View

Actions

Layers

Navigation

Selection

Settings

Projects

Project ID	Contract No	Route	Location of site	Counties	District	Project
2025411		US 41	US 41 at RP 146.81	Parke	Crawfordsville	Landsl...
2201089	T-44557	SR 26	SR 3 and SR 26			
2300035	M-44811	SR 135	at RP 74.57			Landsl...
2300941		US 52		Benton	Crawfordsville	Small S...
2300979		SR 14		Fulton	Laporte	Small S...
2400519	R 45545	SR 234	6.05 mi W of SR 75	Montgomery	Crawfordsville	Small S...
2400521	R 45573	SR 62	From 2.86 miles E of SR 1...	Perry		Small S...
Test Project_copied		Test Project				
TestProject		US Example Project		From SR 47 to US 136 S Jct		
ZZ_Mapping_File_Test		ZZ_Mapping_File_Test				

OpenGround Cloud Prof

(2400521) SR 62 [System Administrator] - OpenGround Cloud Professional (INDOTOpenGround)

Preferences

Configuration

Help

Map Tools

Pan and Tooltip

Select

Clear

Line

Rectangle

Clear

Measure

Quick Log

Log Report

Quick section

Draw

Remove

Save

Buffer

Chainage

Name

Section Production

Coordinates

Reverse

Setup

Preview

Generate

Lock to map

Site Plan Production

Set Initial View

Set Project Extents

Settings

Location Details

Map

Information Layers

Locations

Location Groups

Project

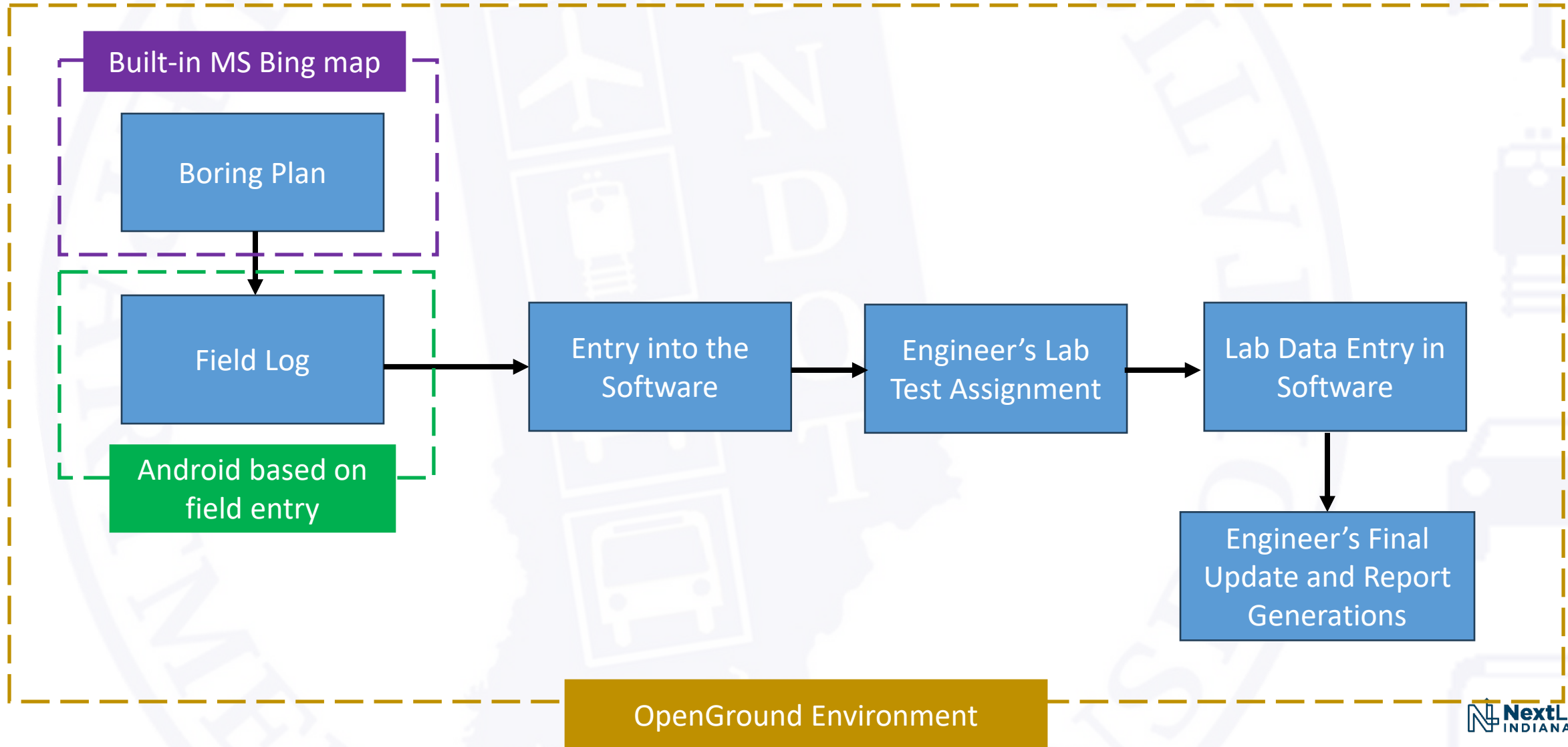
Imported Datasets

WMS Datasets

Background Mapping

The map displays a section of State Road 62, which is highlighted in yellow. Four boring locations are marked with blue crosshair symbols and labeled: TB-1, TB-2, TB-3, and TB-4. The road is flanked by green areas representing land. A label 'Hoosier National Forest' is visible near the bottom center of the map. The road has a '62' shield marker. The map is part of a software interface with various toolbars and a project list on the left.

OpenGround Capability



Android-based Field Data Entry



OpenGround Data Collector
Bentley Systems Incorporated

←

Add Location

✓

Location ID *

kwa1

Location Type *

Geotech BH Geotechnical Borehole

Status *

None Selected

DRAFT

FINAL

HISTORIC

PRELIM

PROPOSED

Elevation (ft)

25

Final Depth (ft)

2

Start Date

123

456

789

,

0

.

✓

End Date

Latitude and Longitude

←

Demo-BTN-001: kwa1

Hole & Drilling Information/Remarks

Field Tests & Other Samples

Rock Coring / Discontinuity Descriptions

Monitoring Well/Installation & Water Levels

SPT

0

Sample Information

0

Descriptions - General/Non-Component

0

Descriptions - Soil - Component

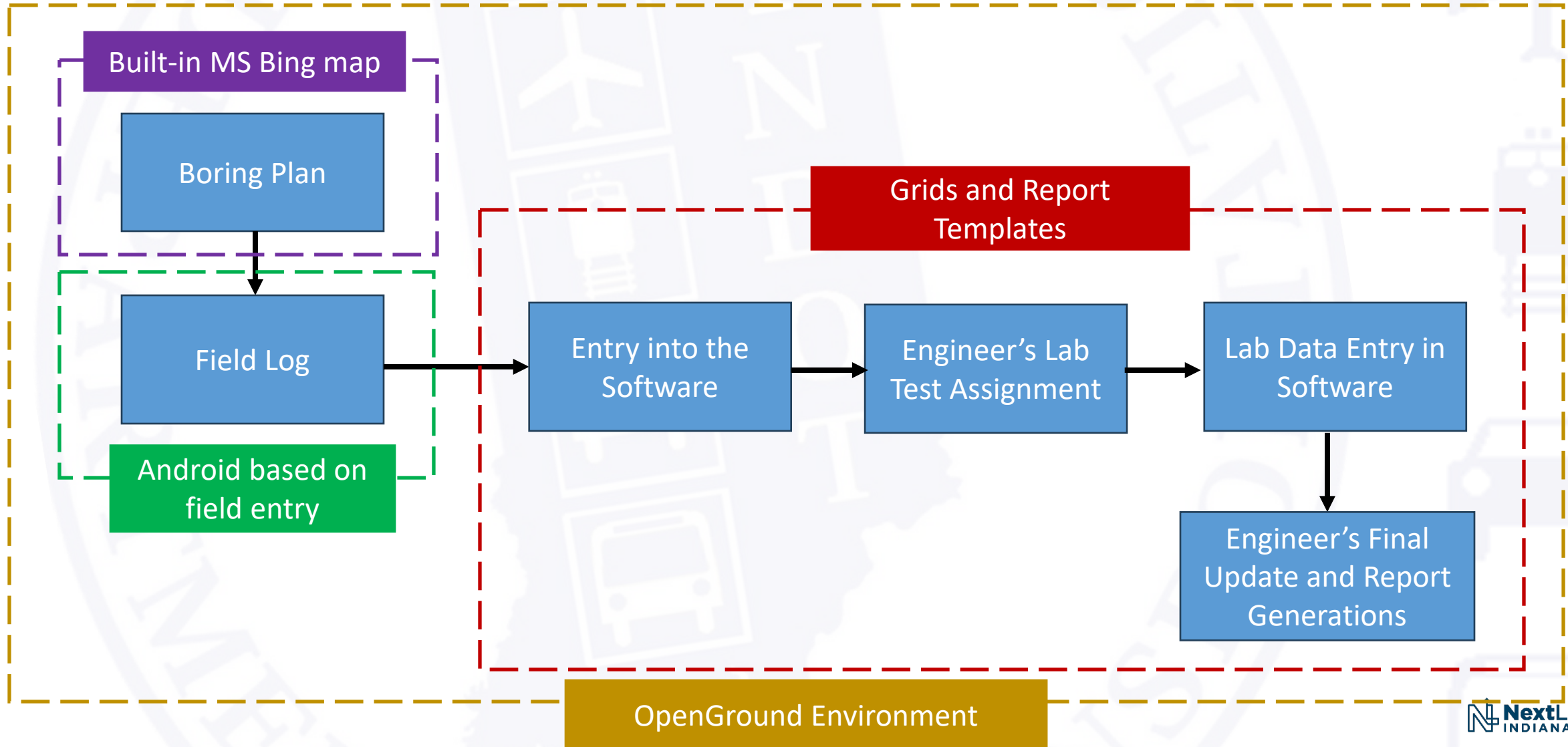
0

Descriptions - Rock - Component

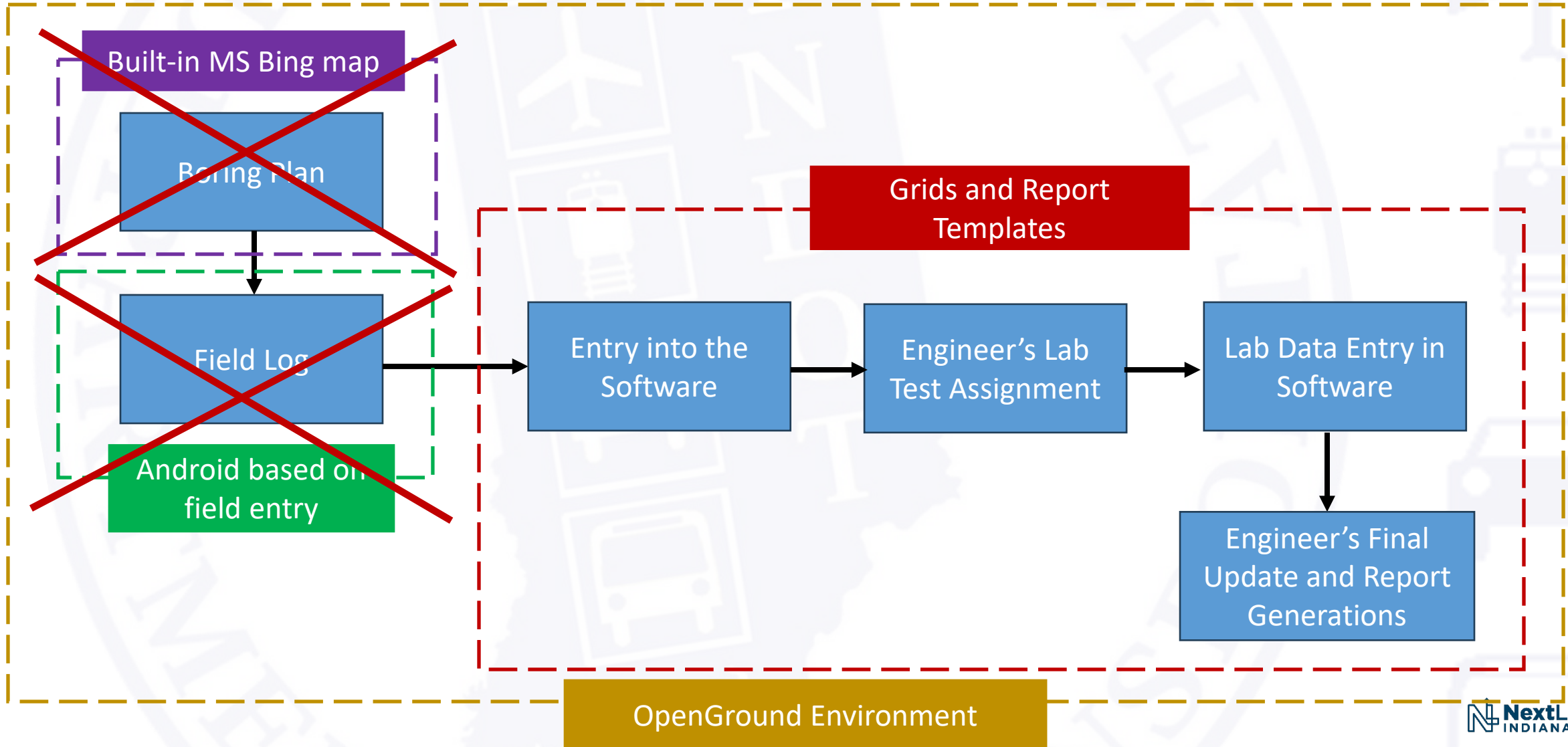
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Detail Descriptions

Process Flow with OpenGround

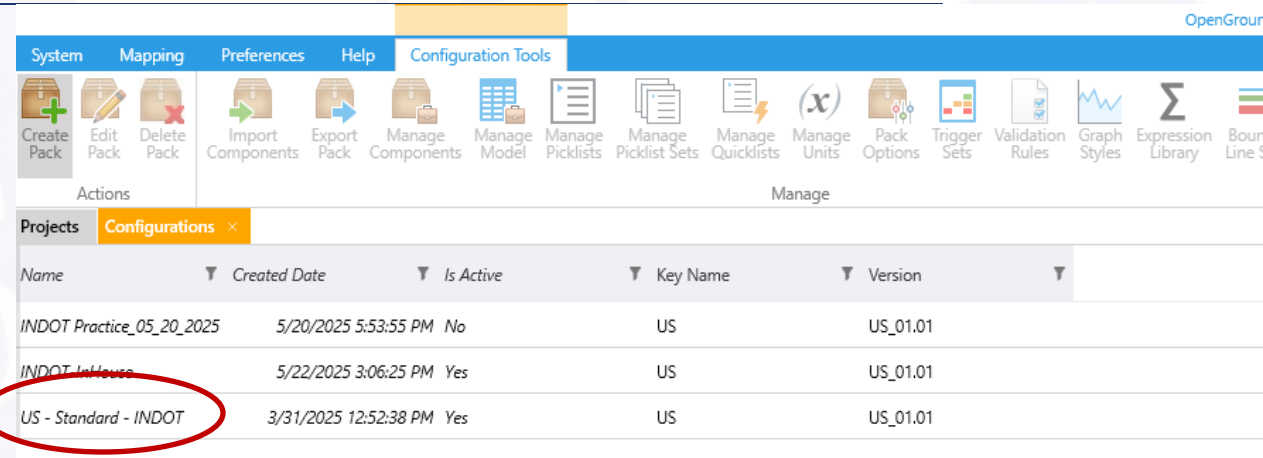


INDOT's Current Approach



OpenGround-Data Entry

- Lab module was **incomplete/ not fully developed**
- The product we received was **not fully customized**, it was more like a generic version
- Bentley created the bore log, classification and topsoil report templates

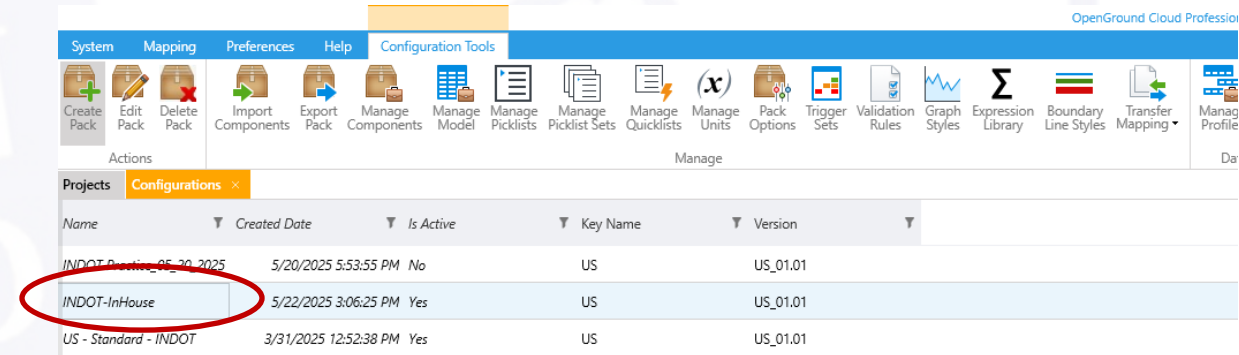


The screenshot shows the OpenGround software interface. The top menu bar includes System, Mapping, Preferences, Help, and Configuration Tools. Below the menu bar is a toolbar with various icons for actions like Create Pack, Edit Pack, Delete Pack, Import Components, Export Pack, Manage Components, Manage Model, Manage Picklists, Manage Picklist Sets, Manage Quicklists, Manage Units, Pack Options, Trigger Sets, Validation Rules, Graph Styles, Expression Library, and Bound Line Styles. Below the toolbar is a table with the following columns: Name, Created Date, Is Active, Key Name, and Version. The table contains three rows of data. The third row, 'US - Standard - INDOT', is circled in red.

Name	Created Date	Is Active	Key Name	Version
INDOT Practice_05_20_2025	5/20/2025 5:53:55 PM	No	US	US_01.01
INDOT InHouse	5/22/2025 3:06:25 PM	Yes	US	US_01.01
US - Standard - INDOT	3/31/2025 12:52:38 PM	Yes	US	US_01.01

Customization of OpenGround

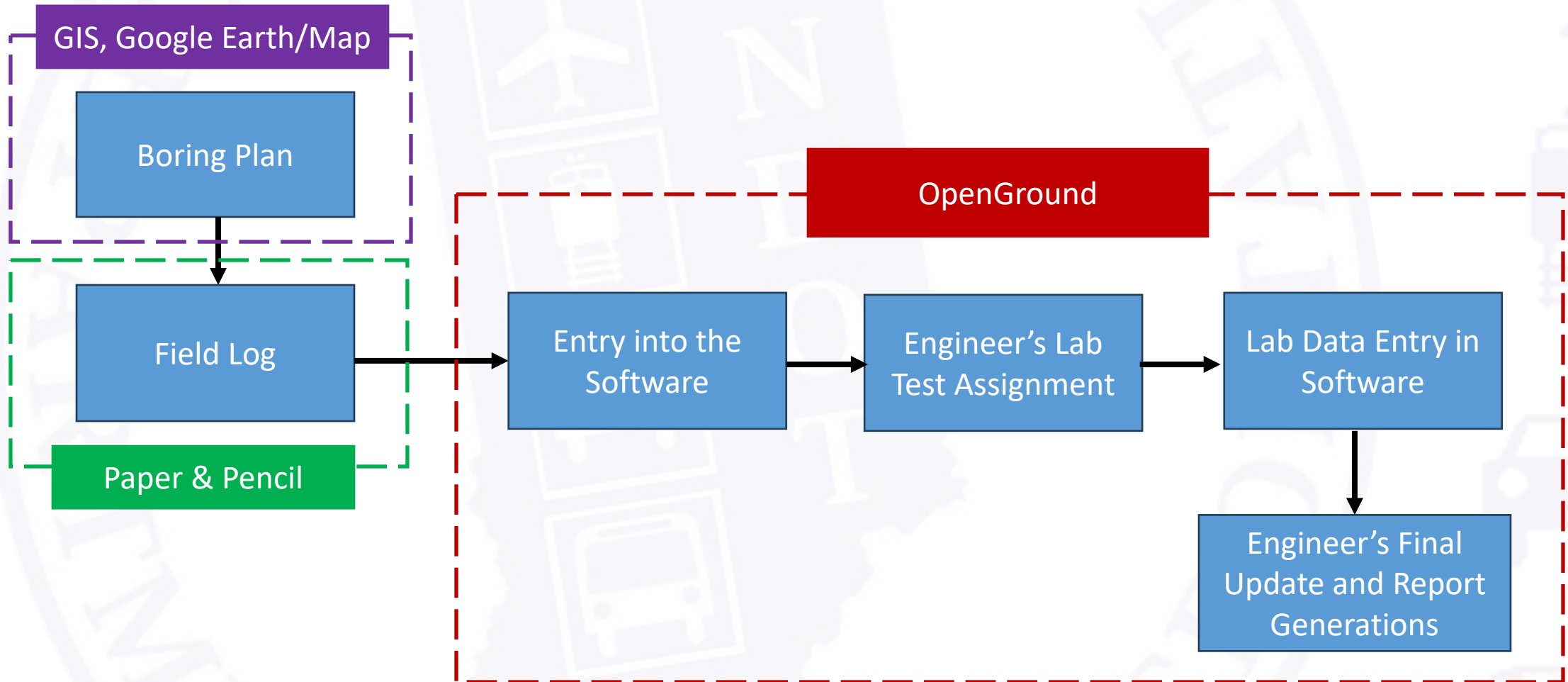
- We customized the software **in-house** so that the process flow to align it with how we were doing now
- We created a **configuration pack** for in-house projects
- We had to adjust the bore log, classification and topsoil reports prepared by Bentely to make them useful
- We customized the lab module and created the lab assignment and other test report templates **in-house**



The screenshot shows the OpenGround Cloud Professional software interface. The top menu bar includes System, Mapping, Preferences, Help, and Configuration Tools. The Configuration Tools menu is open, showing various options like Create Pack, Edit Pack, Delete Pack, Import Components, Export Pack, Manage Components, Manage Model, Manage Picklists, Manage Picklist Sets, Manage Quicklists, Manage Units, Pack Options, Trigger Sets, Validation Rules, Graph Styles, Expression Library, Boundary Line Styles, Transfer Mapping, and Manage Profile. Below the menu, there is a table with the following columns: Name, Created Date, Is Active, Key Name, and Version. The table contains three rows of data, with the second row, 'INDOT-InHouse', highlighted and circled in red.

Name	Created Date	Is Active	Key Name	Version
INDOT-Profile - 05-20-2025	5/20/2025 5:53:55 PM	No	US	US_01.01
INDOT-InHouse	5/22/2025 3:06:25 PM	Yes	US	US_01.01
US - Standard - INDOT	3/31/2025 12:52:38 PM	Yes	US	US_01.01

Process Flow with OpenGround



SPT, Shelby Tube and CoreEntry to OpenGround

OpenGround Cloud Data Entry

Data EntryHelp

ProfileStep 1: Field Soil & Rock Drilling/Logging

StepSPTs, Coring & Other Samples

Profile

Step 4 of 7 Navigation

RefreshSecondary UnitsQuick LogSwitch ProfileBulk UpdateReplicate LocationView AllView SelectedUploadClose

ActionsDocumentsData Entry

TB-1 - Geotech BH - 40

Show Location Grid

US - SPT

Test Number	Depth Top (ft)	Depth Base (ft)	Penetration Total (in)	Recovery (%)	Blows1	Blows Main 2	Blows Main 3	N Value	Reported Result	Remarks
+ Click here to add new item										
1	1.00	2.50	18.0	100	8	4	4	8	8-4-4	
2	3.50	5.00	18.0	30	4	5	7	12	4-5-7	
3	6.00	7.50	18.0	100	4	4	4	8	4-4-4	
4	8.50	10.00	18.0	100	2	3	11	14	2-3-11	
5	13.50	15.00	18.0	100	0	0	0	0	0-0-0	
6	18.50	20.00	18.0	100	3	3	3	6	3-3-3	
7	23.50	25.00	18.0	100	9	9	10	19	9-9-10	
8	28.50	30.00	18.0	100	9	8	8	16	9-8-8	
9	33.50	35.00	18.0	100	22	32	35	67	22-32-35	
10	38.50	40.00	18.0	100	22	34	35	66	22-34-35	

INDOT - Shelby Tube Sampling

Test Number	Depth Top (ft)	Depth Base (ft)	Sample Recovery (%)
+ Click here to add new item			
1	10.00	12.00	50

INDOT - Rock Coring

Run Number	Depth Top (ft)	Depth Base (ft)	Sample Recovery (%)	RQD (%)	Remarks
+ Click here to add new item					

Page 1 of 1 (10 of 10)

Draft Lithology

OpenGround Cloud Data Entry

Data Entry

Help

Profile

Step 1: Field Soil & Rock Drilling/Logging

Step

Descriptions - General & Detailed

Profile

Step 5 of 7

Navigation

Refresh

Secondary Units

Quick Log

Switch Profile

Bulk Update

Replicate Location

View All

View Selected

Upload

Close

B-1 - Geotech BH - 19.1

Show Location Grid

US - Field Geological Descriptions - General - ...

Depth Top (ft)	Depth Base (ft)	Type	Legend Code	Texture	AASHTO	AASHTO Group L...	Modifier	Color	Moisture Min	Moisture Max	Consistency or D...	Consister
+ Click here to add new item												
0.00	1.00		ASPHALT	Asphalt								
1.00	2.50		IN SILTY LOAM	Silty Loam				brown	moist		soft	
2.50	7.50		IN CLAY LOAM	Clay Loam				brown	moist		stiff	
7.50	19.10		IN CLAY	Clay				grayish	moist		stiff	

Lab Test Assignment

Data Entry

Help

Profile

Step 2: Lab Test Assignment

Step

Lab Test Assignment Request

Profile

TB-1 - Geotech BH - 40

Step 2 of 3

Navigation

Refresh

Secondary Units

Quick Log

Switch Profile

Bulk Update

Replicate Location

View All

View Selected

Upload

Close

Documents

Data Entry

INDOT - Lab Assignment Request

Depth Top (ft)	Depth Base (ft)	Sample Reference	Test Assignment 1	Test Assignment 2	Test Assignment 3	Test Assignment 4	Test Assignment 5	Remarks	Lab Request Date (dd/mm/yyyy)	Sample Type	Type
0.00	1.00	TS-1	Top Soil Tests							TopSoil	
1.50	2.00	SS-1T	% Moisture							Other	
6.50	7.50	SS-3T&B	M & P	% Moisture				Combine 3T&B		Classification	
9.00	9.50	SS-4T	LOI							Other	
19.00	20.00	SS-6T&B	M & P	% Moisture				Combine 6T&B		Classification	

Lab Data Entry

Data Entry

Help

Profile

Step 3: Lab Index & Strength Test Data

Step

Grain Size Distribution Data

Navigation

Step 5 of 16

Actions

RefreshSecondary UnitsQuick LogSwitch ProfileBulk UpdateReplicate LocationView AllView SelectedUploadClose

Documents

Data Entry

TB-2 - Geotech BH - 18.9

INDOT - Lab ID Assignment

Sample Reference	Depth Top (ft)	Depth Base (ft)	Lab ID	Lab Request Date (dd/mm/yyyy)	Date Time Compl... (mm/dd/yyyy hh:...
SS-1-B	2.00	2.50	8157		
SS-2-B	4.50	5.00	8158		
TS-2	0.00	1.00	8159		

US - Particle Size Distribution - Data

Particle Size (mm)	Percentage Passi... (%)	Test Type	Remarks
0.0014	9.1		
0.0033	13.9		
0.0066	20.4		
0.009	26.7		
0.0124	33.7		
0.0205	48.9		
0.031	60.8		
0.075	81.2		
0.425	96.8		
2	99.1		
4.75	100.0		

Page 1 of 1 (3 of 3)

INDOT - Classification Summary

Specimen Refer...	Depth Specime... (ft)	Texture Classifica...	AASHTO Classific...	AASHTO Group I...	Percentage Gravel (%)	Pe (%)
TS-2	0.00	Silt			0.9	17

NextLevel INDIANA

Final Edits

OpenGround Cloud Data Entry

Data Entry

Help

Profile

Step 1: Field Soil & Rock Drilling/Logging

Step

Descriptions - General & Detailed

Profile

TB-1 - Geotech BH - 40

Navigation

Step 5 of 7

Actions

Refresh

Secondary Units

Quick Log

Switch Profile

Bulk Update

Replicate Location

Documents

View All

View Selected

Upload

Close

Data Entry

Show Location Grid

US - Field Geological Descriptions - General - ...

Depth Top (ft)	Depth Base (ft)	Type	Legend Code	Texture	AASHTO	AASHTO Group L...	Modifier	Color	Moisture Min	Moisture Max	Consistency or D...	Consisten...
0.00	1.00		■ ASPHALT	Asphalt								
1.00	5.00	Soil	IN LOAM	Loam	A-4			brown	moist		loose	medium
5.00	10.00	Soil	IN CLAY LOAM	Clay Loam	A-6	5		gray	moist		medium stiff	stiff
10.00	20.00	Soil	IN LOAM	Loam	A-4	5		brown	wet		very loose	loose
20.00	25.00	Soil	IN SAND	Sand				gray	wet		medium dense	
25.00	35.00	Soil	IN GRAVELLY SAND	Gravelly Sand	A-1-b			gray	wet		medium dense	very dens
35.00	40.00	Rock	IN LIMESTONE					gray	wet			

NextLevel

INDIANA



Report Generation

(2400521) SR 62 [System Administrator] - OpenGround Cloud Professional (INDOTOpenGround)

Project Data Scheduling Mapping Preferences Configuration Help Log Tools

Reload Data Save as PDF Save ProjectSheet

Template Project Sheet - Grain Size Distribution Test Report - INDOT

Paper Size Letter

Portrait Landscape

Page Setup

Settings

All Data

Location Details Project Sheet

Page: 1 of 1

60%

Summary

- Location Details (4)
 - Geological Information
 - Hole Construction
 - Insitu Tests
 - Monitoring
 - Samples and Lab Tests
- Options
- Reports
 - Geology
 - Statistics
 - Summary
 - Validation
 - Saved Searches
- Sections

PERCENT FINER BY WEIGHT

U.S. SIEVE OPENINGS IN INCHES

U.S. SIEVE NUMBERS

HYDROMETER

GRAIN SIZE IN MILLIMETERS

COBBLES GRAVEL SAND coarse fine SILT CLAY

Specimen Identification	Classification	LL	PL	PI	Co	Cu
TS-1 TS-1 0.0-1.0	Silty Loam					

Specimen Identification	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	%Colloid
TS-1 TS-1 0.0-1.0				3.1	42.7	43.8	10.4	

Indiana Department of Transportation
Division of Geotechnical Engineering

GRAIN SIZE DISTRIBUTION TEST REPORT

DES #: 2400521 Structure #:
Project #: R 45573
County: Perry
Location: From 2.86 miles E of SR 145 to 3.21 miles E of SR 145

Telephone:
Fax:

Implementation of OpenGround

- We conducted couple of training sessions in-house
 - 3 for the Engineers
 - 2 for the lab folks
- We prepared instruction manuals
- We are using it for the In-House projects
- We are still learning, and keep working on improving as needed

Some Hurdles!

- Still under development
 - No support for DIGG yet.
 - Our customization of OpenGround may cause some issues.
 - Lab Module not developed yet.
 - CPT data import. Need mapping templates for that. The correlations could be programmed but it can slow down the system considerably and, in some cases, it can crash it.
- Consultant's Data import and Historical Data
- No direct GIS Integration, need to buy additional API license for that.
- Field Data Entry.
 - Supports only Android-Based devices.
- Mapping

Conclusions

- OpenGround is customizable
- Launcher: Different ways of entering data
- You can data mine data from different projects for analysis
- Some limitations at this point

INDOT Geotechnical Data

- Boring data
- Retaining wall data
- Pile data
- Slide data
- Pavement data

Thank You

Questions and Discussion

