GeotechnicaME 2012

"The Value of Good Geotechnical Data Management"

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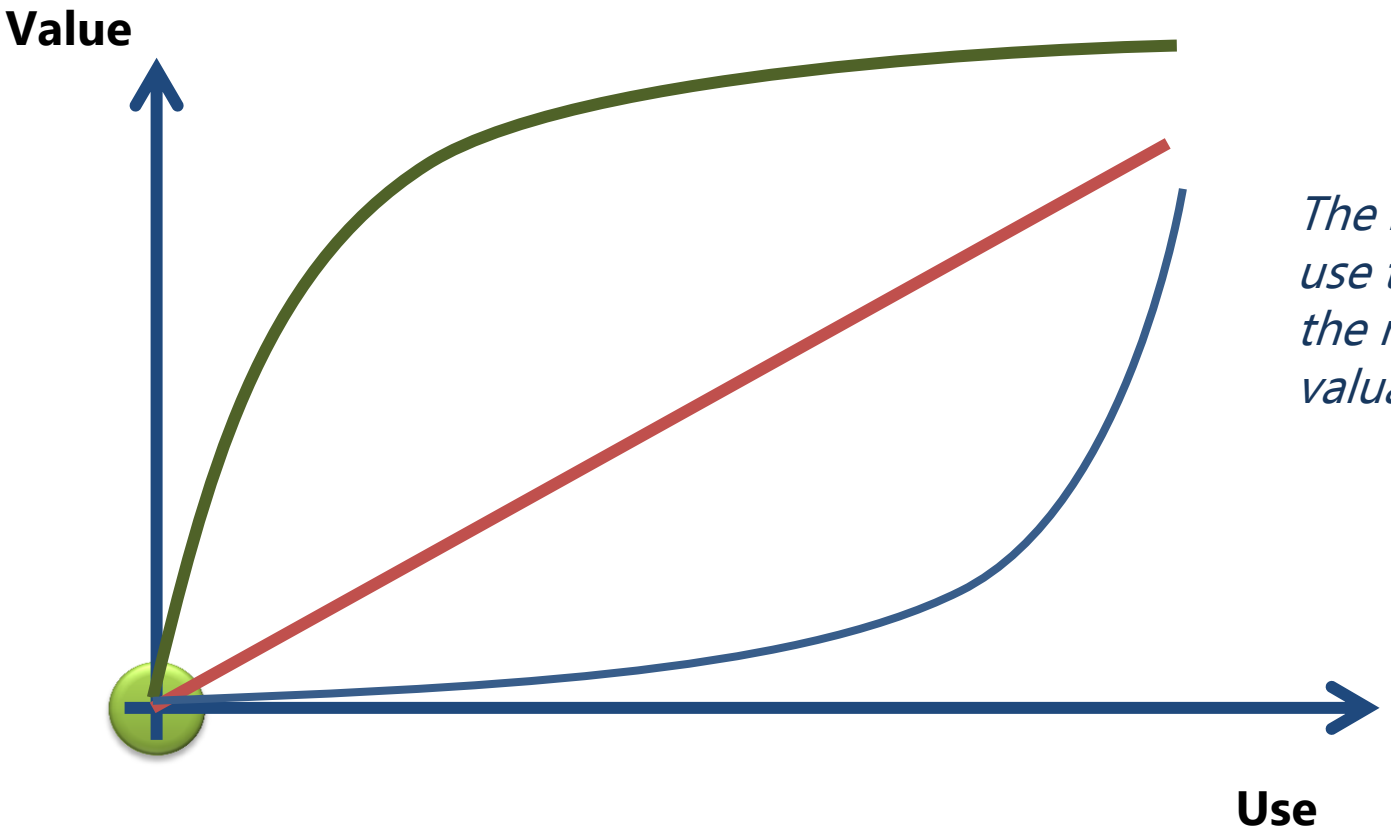
Keynetix

1. What is geotechnical data management?
2. What are the financial implications?
    1. On site
    2. In the laboratory
    3. At the offices
    4. National Archive
3. How can you increase data value?

Contents

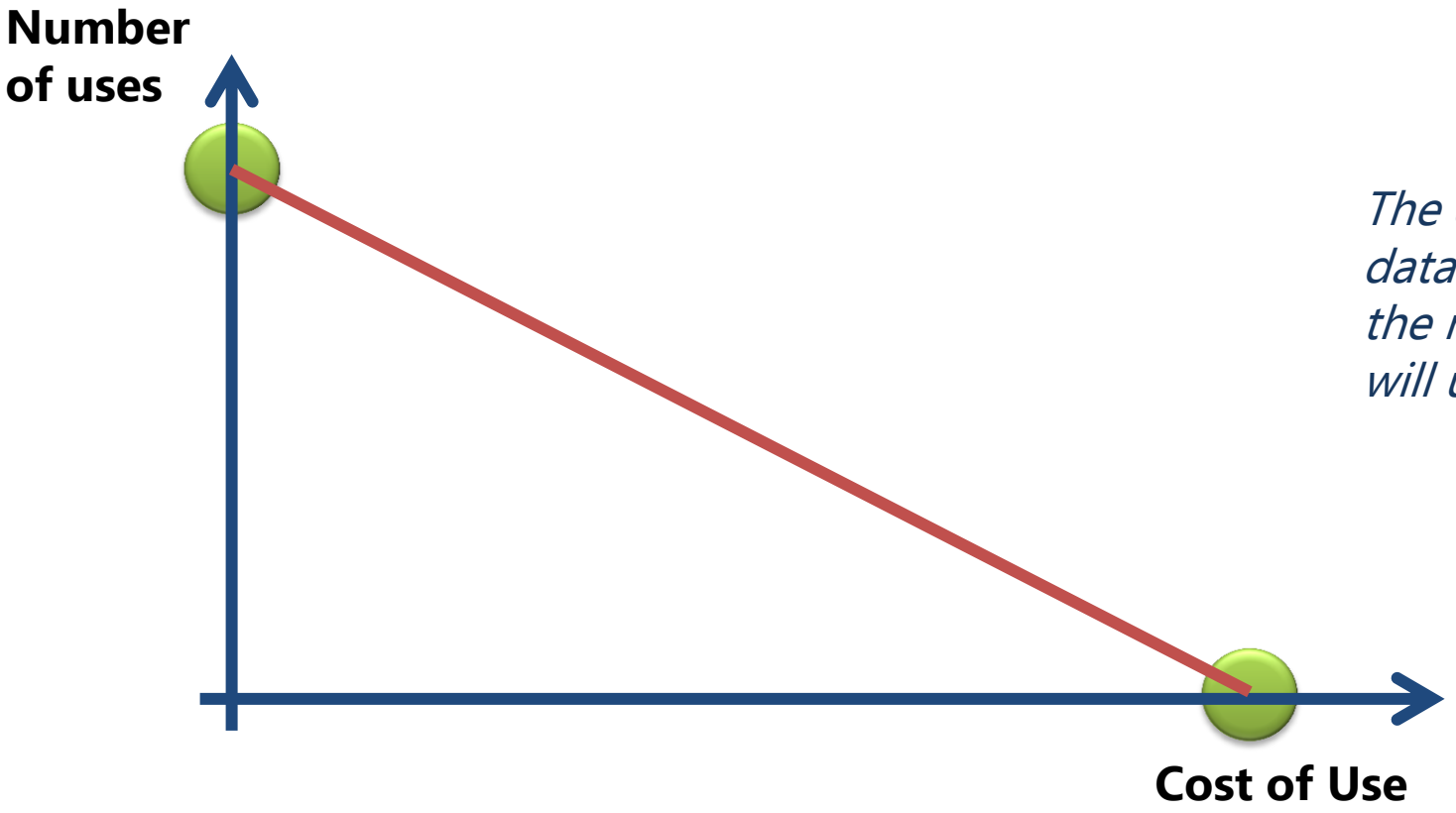
How do you measure the value of data?



The more you use the data the more valuable it is

Measuring the value of data

How many times will you use the data?



The easier the data is to use the more you will use it

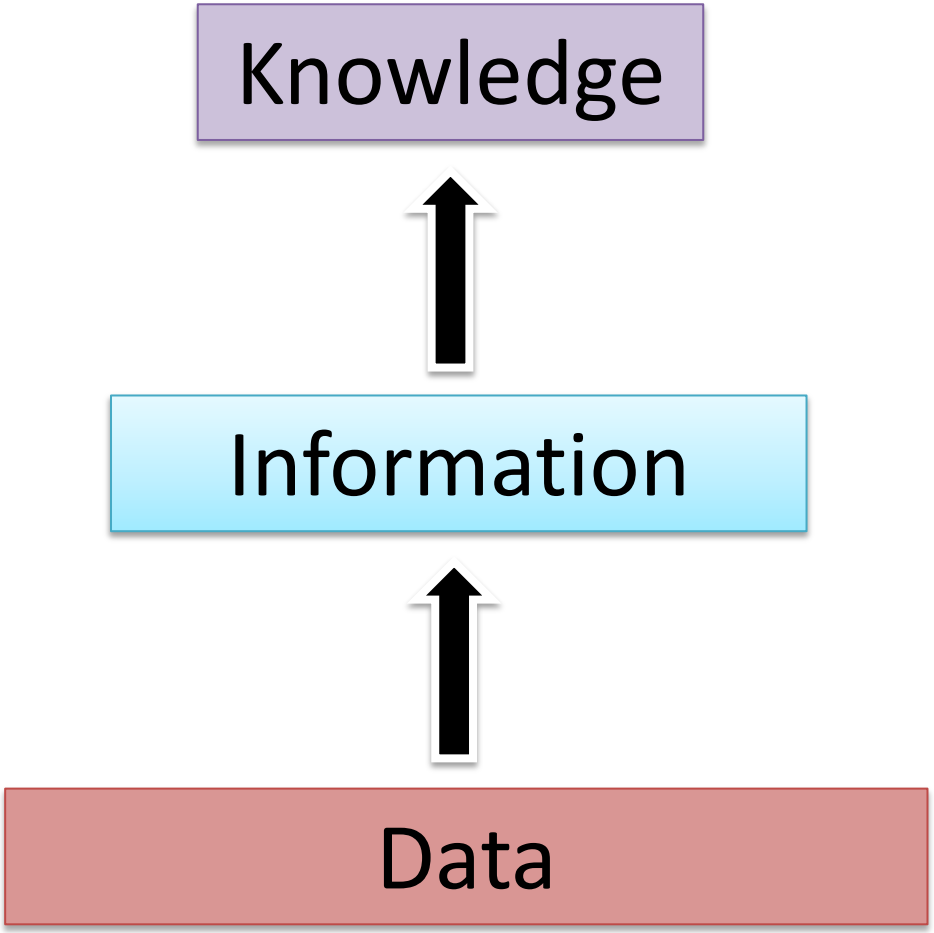
Ease of use affects the value of the data

Ease of use

Uses

Value

WHAT IS GEOTECHNICAL DATA?



Knowledge

- Better design
- Control of risk
- Cost effective

Information

- Borehole logs
- Sections
- Site plans
- Charts

Site Investigation data

- Field observations
- Lab data
- Monitoring Data
- Environmental data

What is data?

- Data is the building block for everything we do.

  Step 1 - Create data

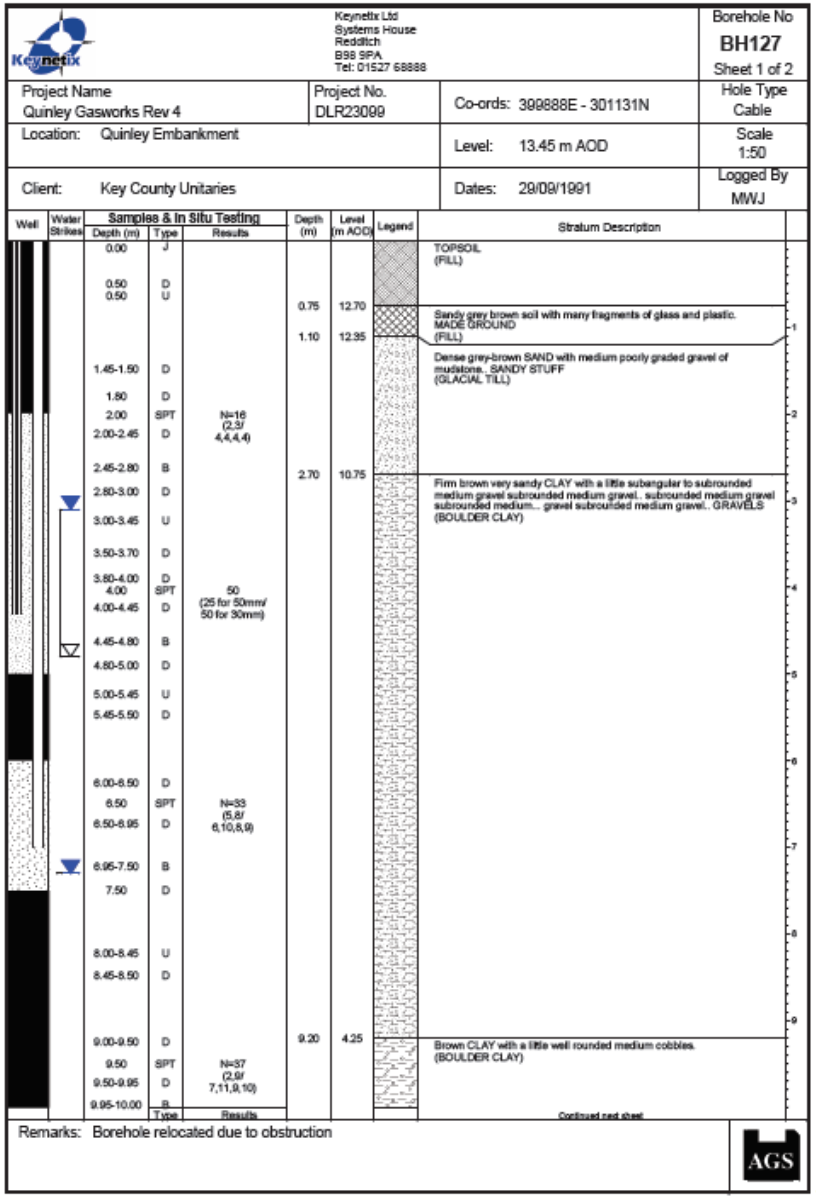
  Step 2 - Create information from data

~~Step 3 – Ignore data~~

- Is this Data or Information?
  - Can you process it into one or more forms of information without re-entering it or having a PhD in cutting and pasting technology?
    - Yes = Data
    - No = Information

Warning

AUDIENCE PARTICIPATION ALERT



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Borehole No
BH127
Sheet 1 of 2

Project Name: Quinley Gasworks Rev 4	Project No.: DLR23099	Co-ords: 399888E - 301131N	Hole Type: Cable
Location: Quinley Embankment		Level: 13.45 m AOD	Scale: 1:50
Client: Key County Unitaries		Dates: 29/09/1991	Logged By: MWJ

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
		0.00	J					TOPSOIL (FILL)
		0.50	D					
		0.50	U		0.75	12.70		
					1.10	12.35		Sandy grey brown soil with many fragments of glass and plastic. MADE GROUND (FILL)
		1.45-1.50	D					Dense grey-brown SAND with medium poorly graded gravel of mudstone.. SANDY STUFF (GLACIAL TILL)
		1.80	D					
		2.00	SPT	N=16 (2,3/ 4,4,4,4)				
		2.00-2.45	D					
		2.45-2.80	B		2.70	10.75		
		2.80-3.00	D					Firm brown very sandy CLAY with a little subangular to subrounded medium gravel subrounded medium gravel.. subrounded medium gravel subrounded medium... gravel subrounded medium gravel.. GRAVELS (BOULDER CLAY)
		3.00-3.45	U					
		3.50-3.70	D					
		3.80-4.00	D					
		4.00	SPT	50 (25 for 50mm/ 50 for 30mm)				
		4.00-4.45	D					
		4.45-4.80	B					
		4.80-5.00	D					
		5.00-5.45	U					
		5.45-5.50	D					
		6.00-6.50	D					
		6.50	SPT	N=33 (5,8/ 6,10,8,9)				
		6.50-6.95	D					
		6.95-7.50	B					
		7.50	D					
		8.00-8.45	U					
		8.45-8.50	D					
		9.00-9.50	D		9.20	4.25		
		9.50	SPT	N=37 (2,9/ 7,11,9,10)				Brown CLAY with a little well rounded medium cobbles. (BOULDER CLAY)
		9.50-9.95	D					
		9.95-10.00	B					
		Type		Results				Continued next sheet

Remarks: Borehole relocated due to obstruction

AGS

A Borehole Log

✗ Data

or

✓ Information

Data or Information

	A	B	C
1	Date	Location ID	Water Depth
2	02/05/2012	BH 1	24.185
3	03/05/2012	BH 1	23.82
4	04/05/2012	BH 1	23.455
5	08/05/2012	BH 1	22.37
6	09/05/2012	BH 1	21.84
7	10/05/2012	BH 1	21.885
8	11/05/2012	BH 1	21.805
9	14/05/2012	BH 1	21.5
10	15/05/2012	BH 1	21.26
11	16/05/2012	BH 1	20.5
12	17/05/2012	BH 1	20.805
13	18/05/2012	BH 1	20
14	21/05/2012	BH 1	20.115
15	22/05/2012	BH 1	20.555
16	23/05/2012	BH 1	20.465
17	24/05/2012	BH 1	20.375
18	25/05/2012	BH 1	20.21
19	28/05/2012	BH 1	20.295
20	29/05/2012	BH 1	20.42
21	30/05/2012	BH 1	20.4
22	31/05/2012	BH 1	19.9
23	01/06/2012	BH 1	19.795

An Excel File

✓ **Data**

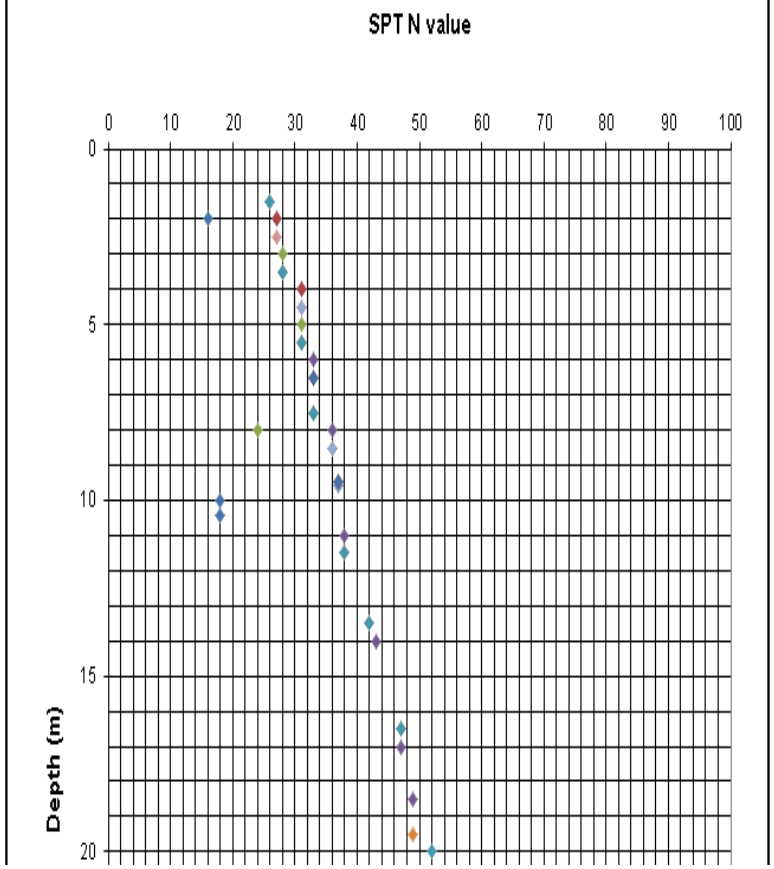
or

✗ **Information**

Data or Information

Depth Plot

SPT Vs Depth		Sheet	1 of 1
Client	Key County Unitaries	Job No.	DLR23099
Site	Quinley Gasworks Rev 4	Date Drawn	06/11/2012



✗ Data

or

✓ Information

Data or Information

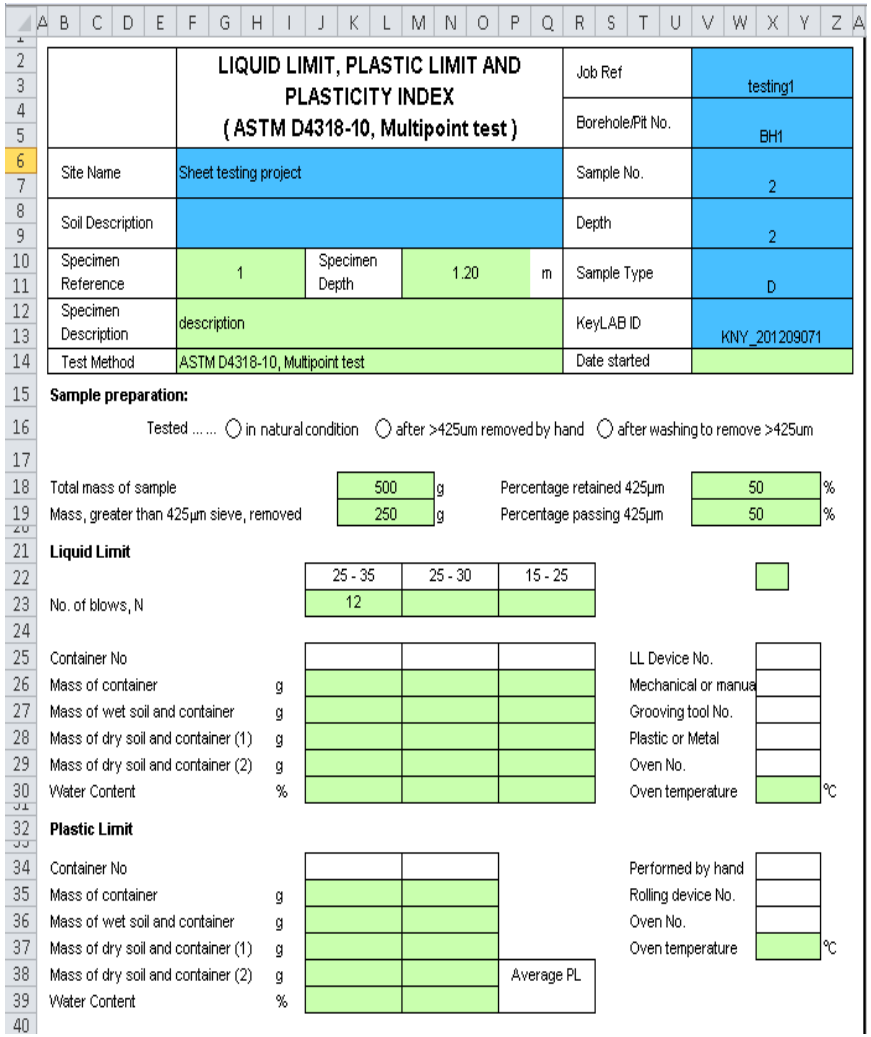
Laboratory Management System

✗ Data

or

✓ Information

Excel Lab Report



	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (ASTM D4318-10, Multipoint test)			Job Ref	testing1
				Borehole/Pit No.	BH1
Site Name	Sheet testing project			Sample No.	2
Soil Description				Depth	2
Specimen Reference	1	Specimen Depth	1.20 m	Sample Type	D
Specimen Description	description			KeyLAB ID	KNY_201209071
Test Method	ASTM D4318-10, Multipoint test			Date started	

Sample preparation:

Tested ..... ◯ in natural condition ◯ after >425um removed by hand ◯ after washing to remove >425um

Total mass of sample	500	g	Percentage retained 425µm	50 %
Mass, greater than 425µm sieve, removed	250	g	Percentage passing 425µm	50 %

Liquid Limit

	25 - 35	25 - 30	15 - 25	
No. of blows, N	12			

Container No					LL Device No.	
Mass of container	g				Mechanical or manua	
Mass of wet soil and container	g				Grooving tool No.	
Mass of dry soil and container (1)	g				Plastic or Metal	
Mass of dry soil and container (2)	g				Oven No.	
Water Content	%				Oven temperature	℃

Plastic Limit

Container No					Performed by hand	
Mass of container	g				Rolling device No.	
Mass of wet soil and container	g				Oven No.	
Mass of dry soil and container (1)	g				Oven temperature	℃
Mass of dry soil and container (2)	g			Average PL		
Water Content	%					

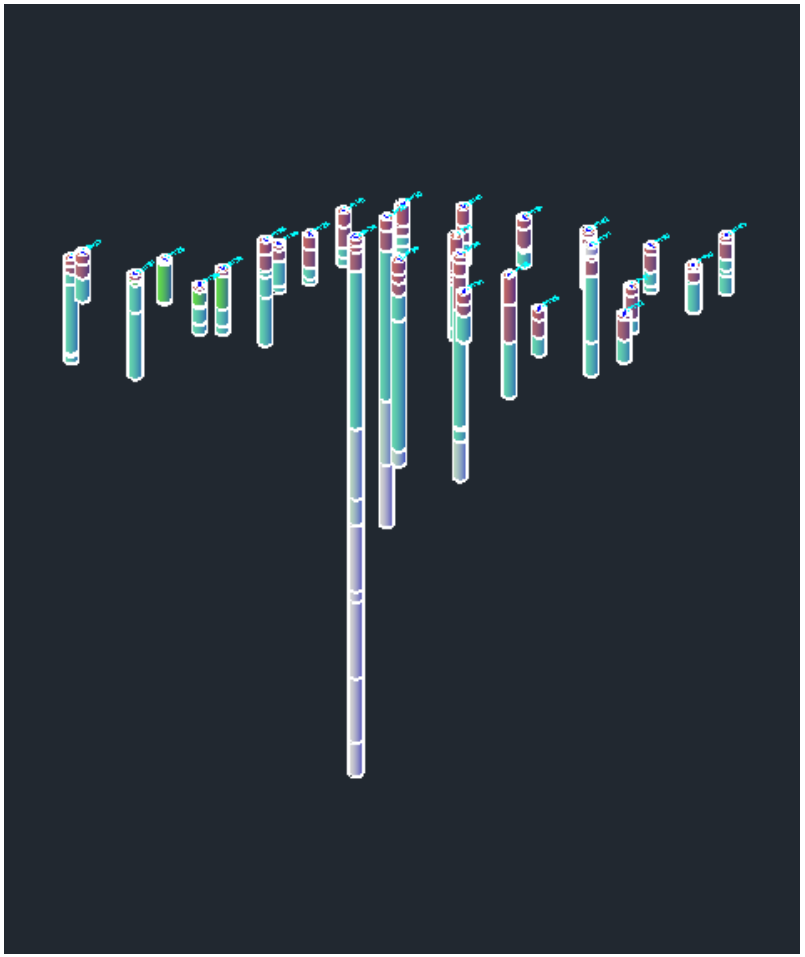
✗ **Data**

or

✓ **Information**

Data or Information

3D BIM

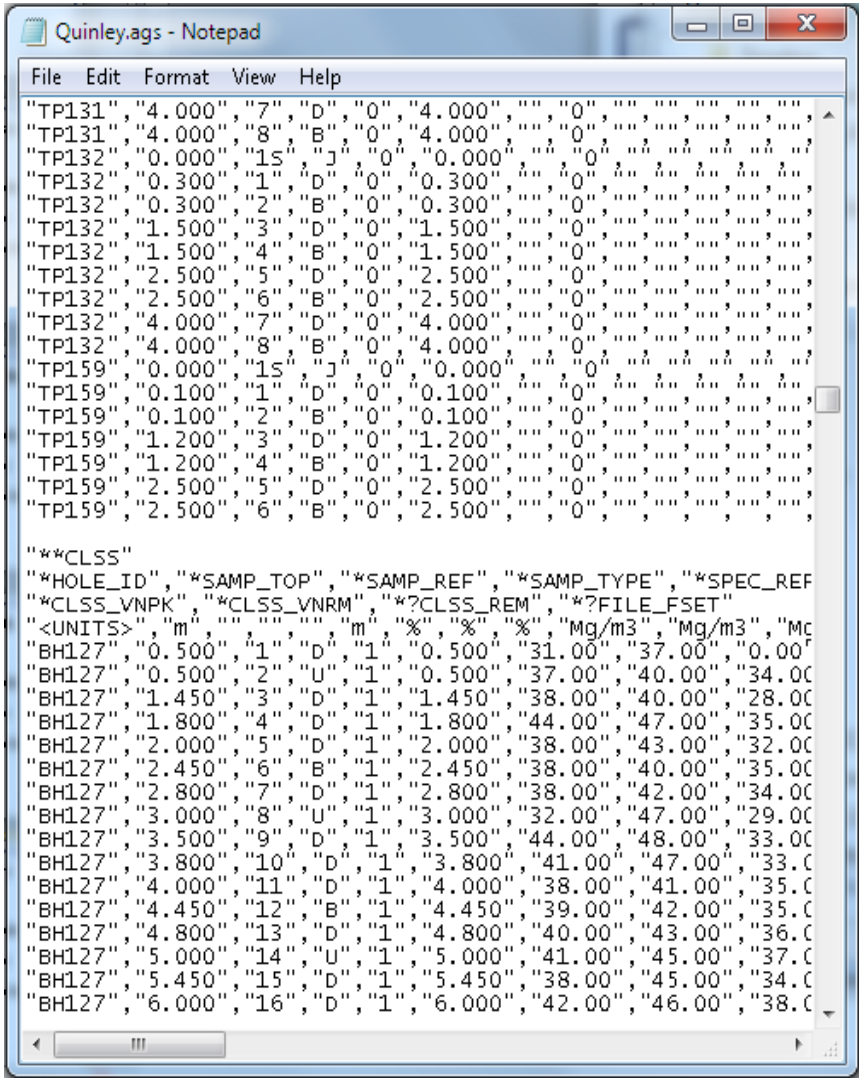


✓ **Data**

or

✓ **Information**

AGS Data File

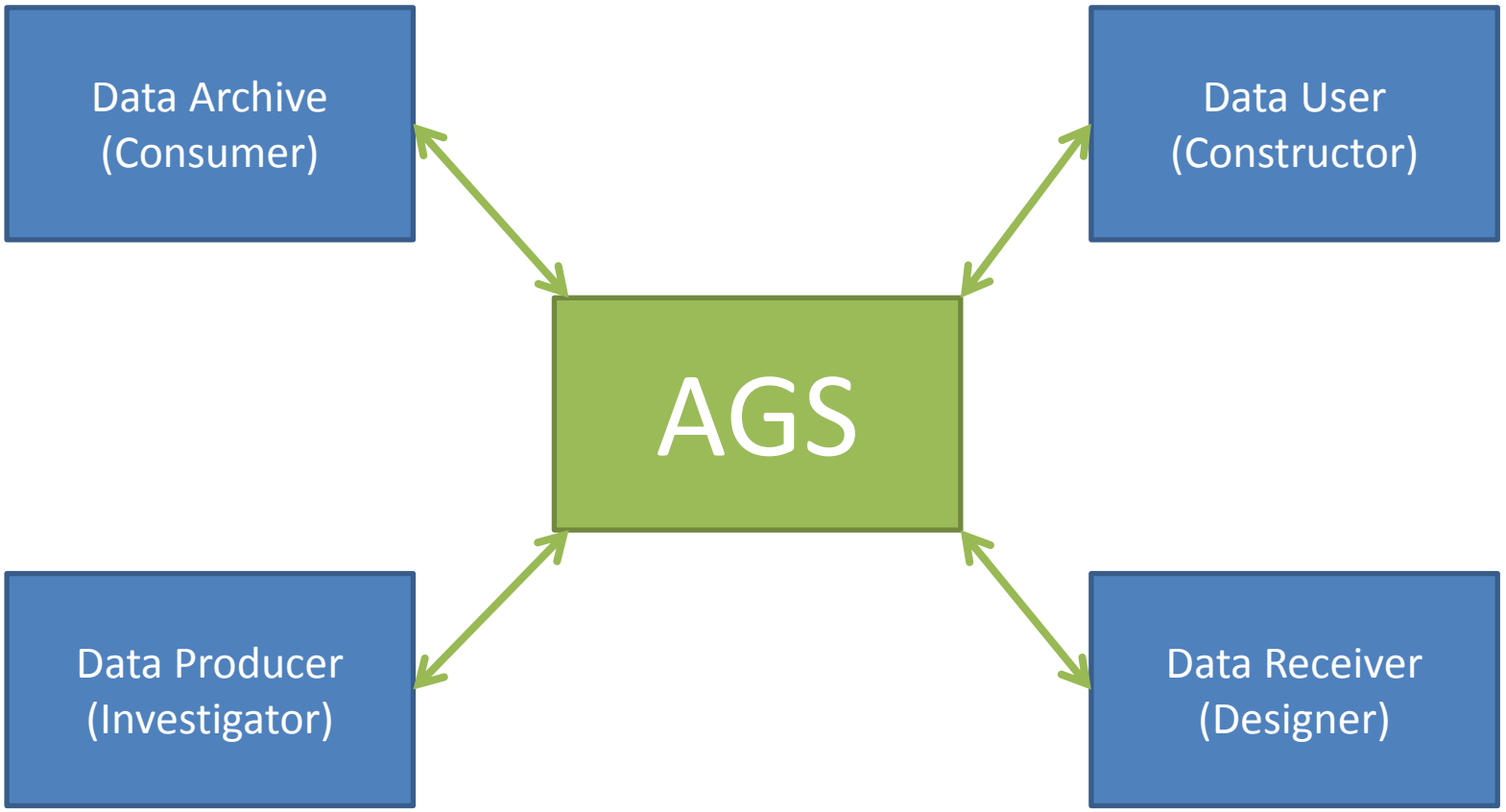


✓ **Data**

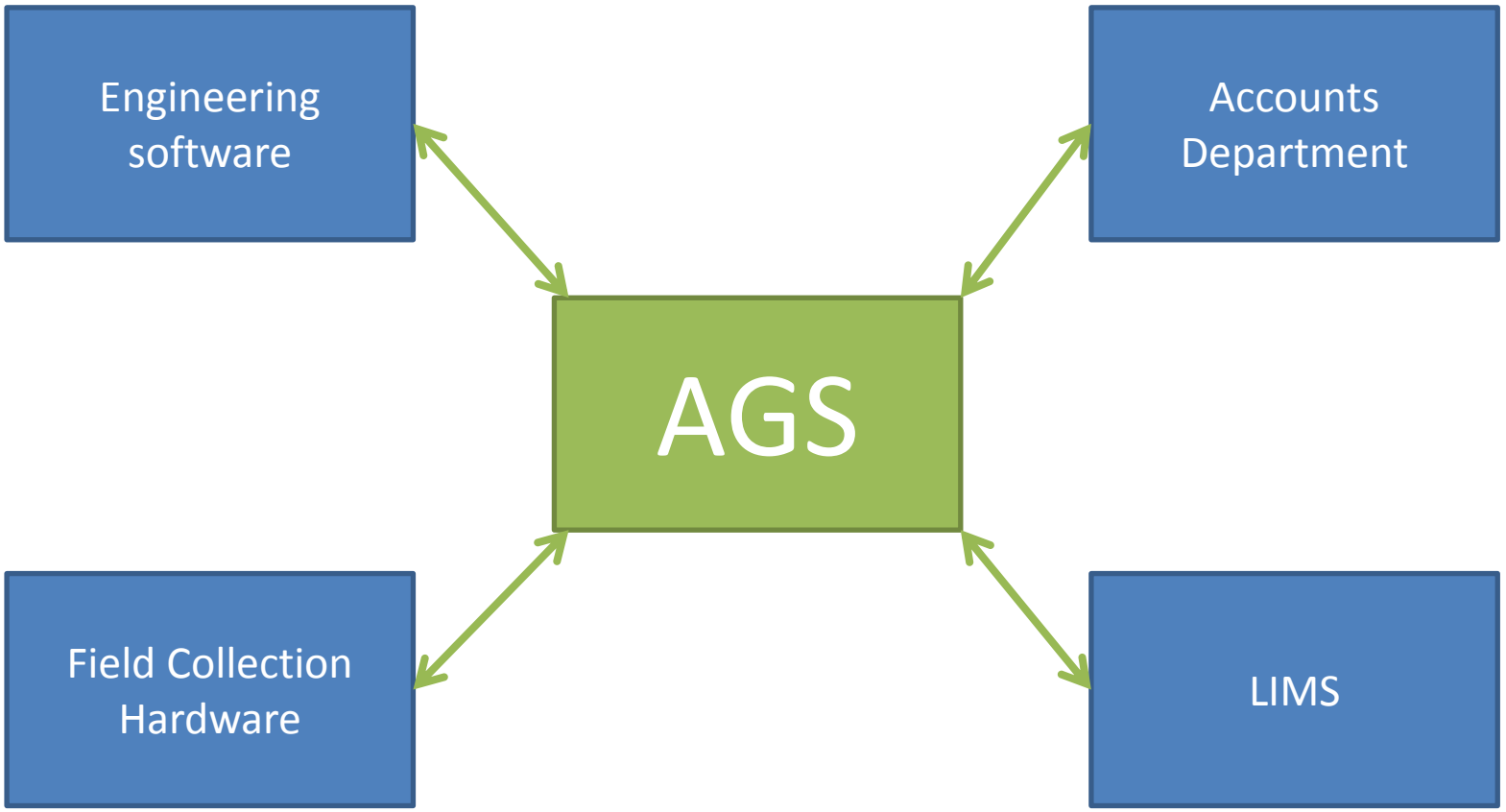
or

✗ **Information**

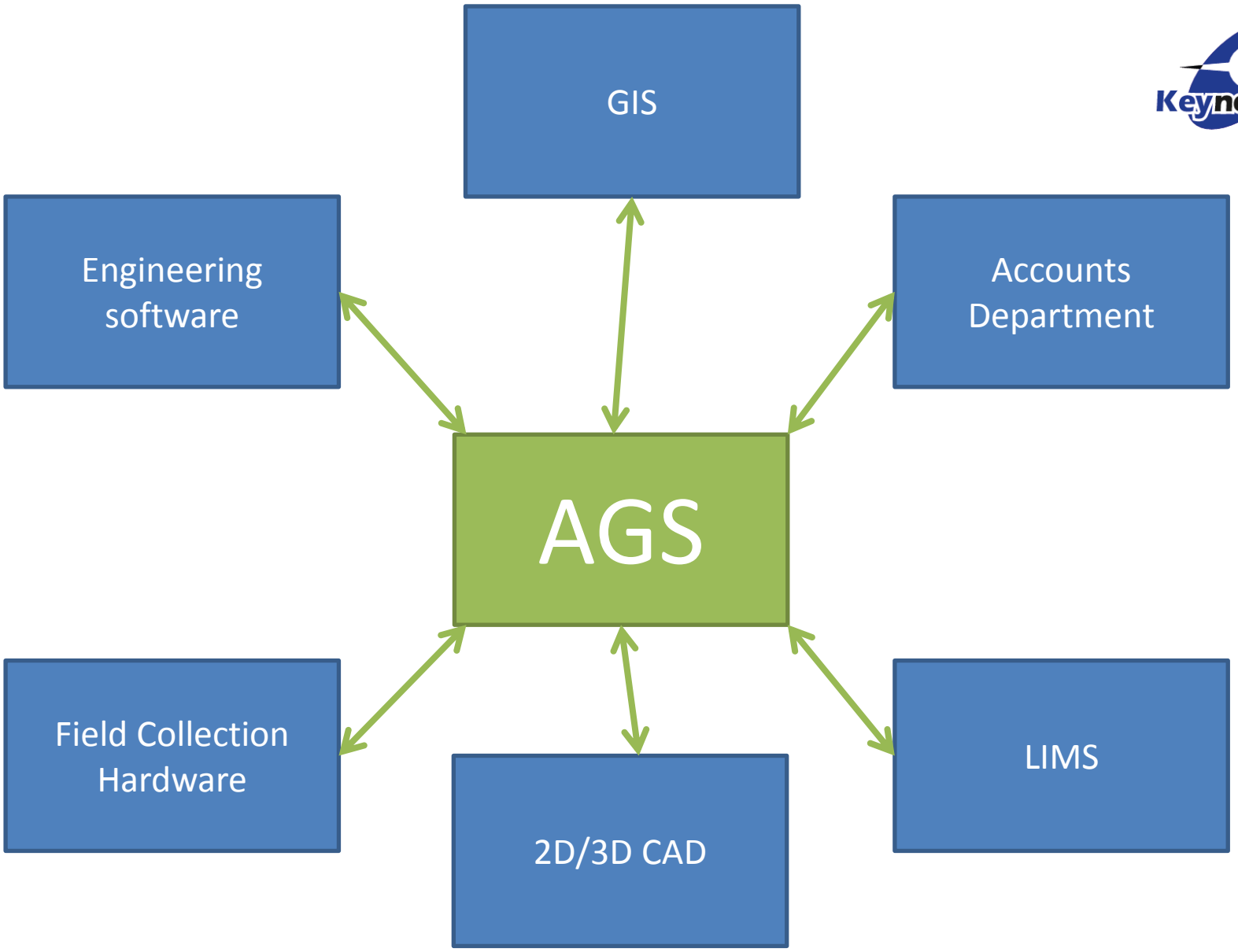
Data or Information



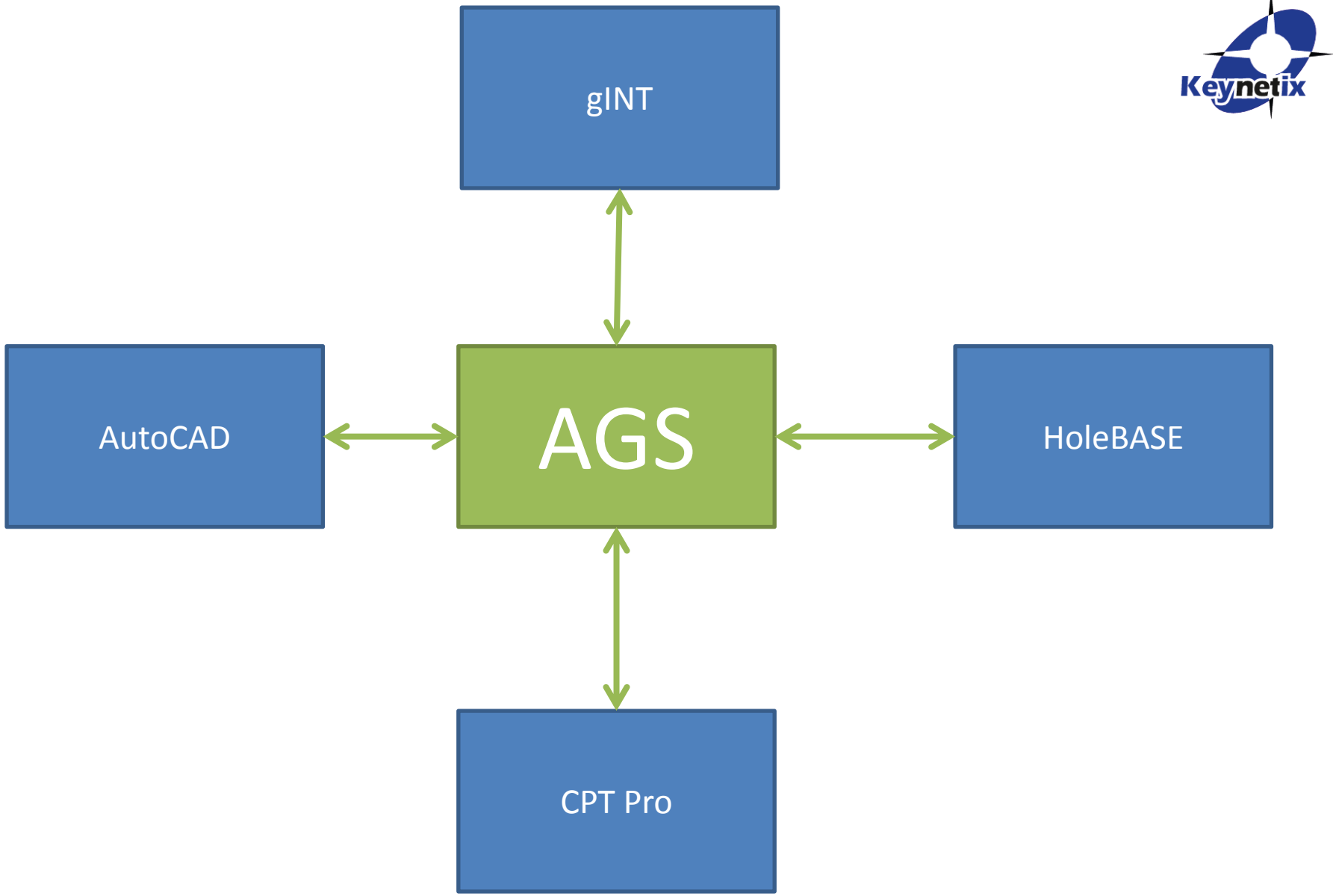
AGS original view – external focus



AGS view – internal focus



AGS view – internal focus



Data Freedom

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DATA Data

Think “data”

The Two Golden Rules

Only Enter Data Once
Get Someone Else to do it

(Only enter data you have created)

(Log electronically as close to source as possible and use data transfer formats)

Two Golden Rules

EXAMPLES

	Pen based collection	Electronic collection
Time on site	2 days	
Log production	4 hours	

	Pen based collection	Electronic collection
Time on site	2 days	2 days
Log production	4 hours	10 minutes

Saving £200 = 1000QR
PER DAY ON SITE

In the Field

	Excel based Storage Solution	LIMS
Testing Time	2 days	
AGS data production	2 hours	

In the Lab

	Excel based Storage Solution	LIMS
Testing Time	2 days	2 days
AGS data production	2 hours	2 minutes

Saving £100 = 500 QR
PER DAY OF TESTING

In the Lab

5 days on site

10 days of testing

£3,000 – 15,000 QR saving

	With Information	With Data
Section Diagrams	3 hours each	
Parameter Plots	2 hours each	
Detailed analysis of data	2 days	

In the Office

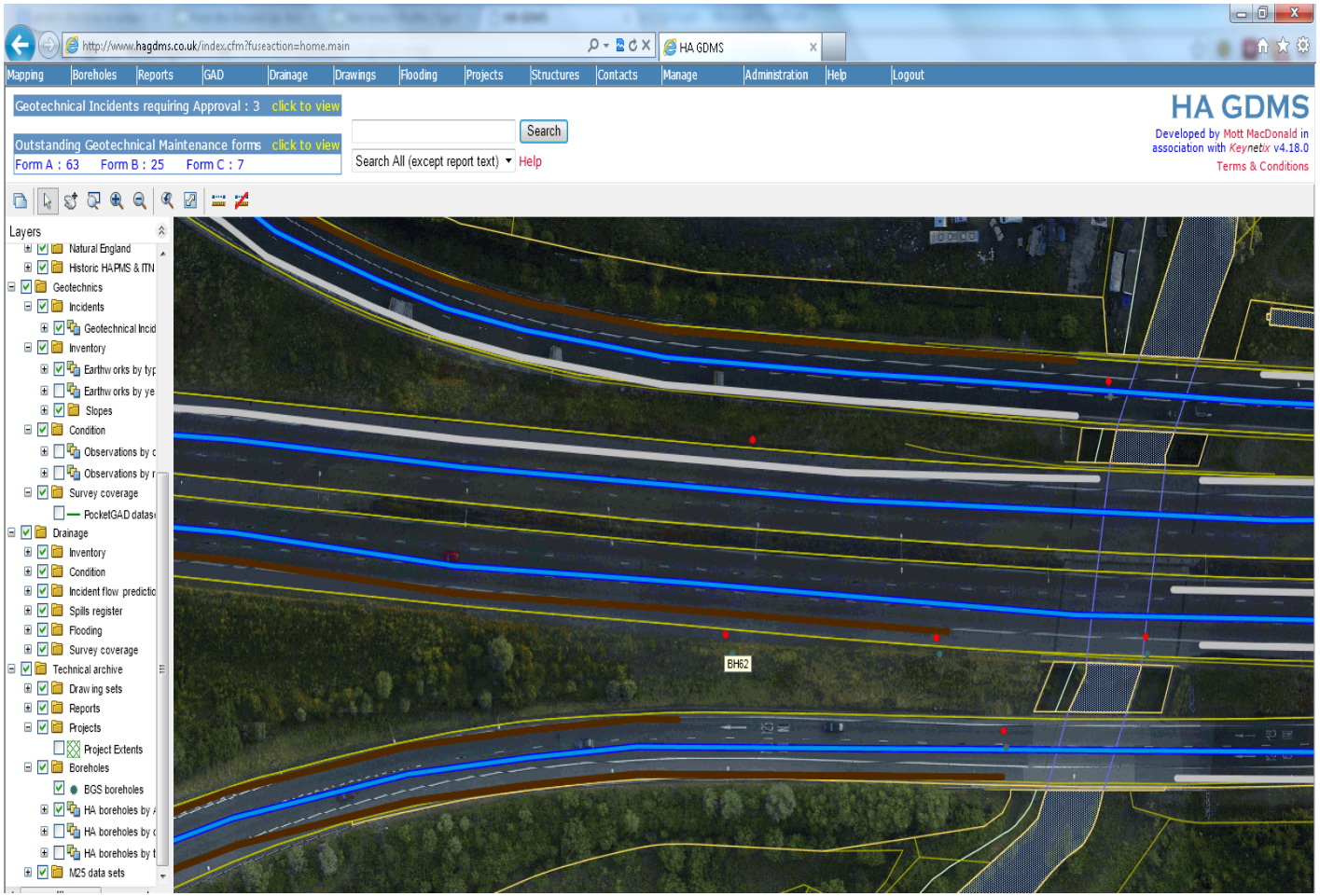
	With Information	With Data
Section Diagrams	3 hours each	10 minutes
Parameter Plots	2 hours each	2 minutes
Detailed analysis of data	2 days	1 hour

In the Office

		With Information	With Data
5	Section Diagrams	15 hours	50 minutes
10	Parameter Plots	20 hours	20 minutes
1	Detailed analysis of data	16 hours	1 hour
	Total	51 hours	2.5 hours

Saving £5,000 = 25,000 QR

In the Office



National Archive

	HAGDMS	Inside your company
Collection of historic borehole data	10 minutes	???

National Archive

- Removal of double entry reduces errors
- Removal of triple entry reduces errors
- Removal of quadruple entry reduces errors

- Greater use of geotechnical data leads to a better understanding of the geotechnical problems

INCREASING DATA VALUE

- Embrace AGS data
  - Don’t start your learning process at the end of a project!
  - Ensure that all systems are AGS compatible (directly or indirectly)

- Identify areas of data inefficiency
  - Only enter data once
  - Transfer data from one program to another

- Review software requirements
  - Do you need to upgrade any in house software?
  - Do you need to acquire additional modules or packages?

- Geotechnical Data Procedures
  - Don’t let your knowledge reside with one person
  - Ensure everyone knows how important data is
  - Document your data management procedures in the same way you do your other procedures

- Good quality geotechnical data management will
  - Increase the use of your data
  - Increase your knowledge of the site
  - Reduce errors
  - Save money

Geotechnical data management only costs money if you don't do it