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Data capture

You can't always get what you want,

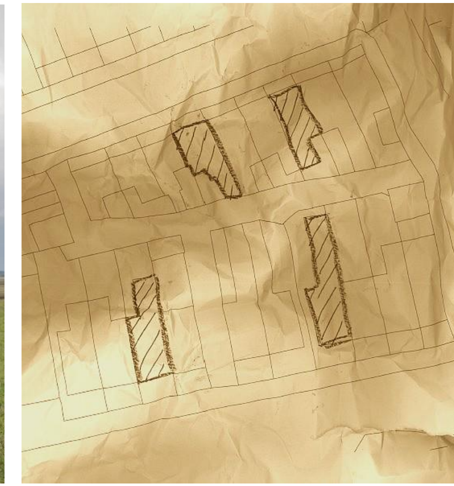
So how do you get what you need?

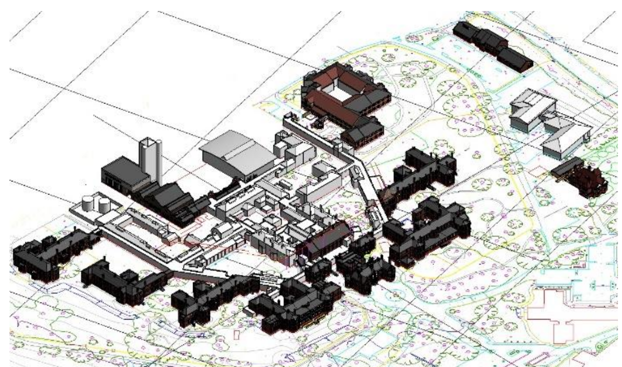
Looking at how our role is changing

- How traditional boundaries are becoming blurred
- The increasing importance of measurement in a digital world
- How technology is affecting our ability to measure
- The importance of accuracy in data

What we do

- Data creation
- Data capture
- Data migration
- Data management
- Data publishing





How we do it

- Mapping services
- GIS services
- Surveying – Topographic, Utilities, Measured Building, Building Services
- 2D CAD and 3D Building Information Modelling services

- We accurately measure and record property, estates and land

Data capture

New technologies, new opportunities, new methods

The digital revolution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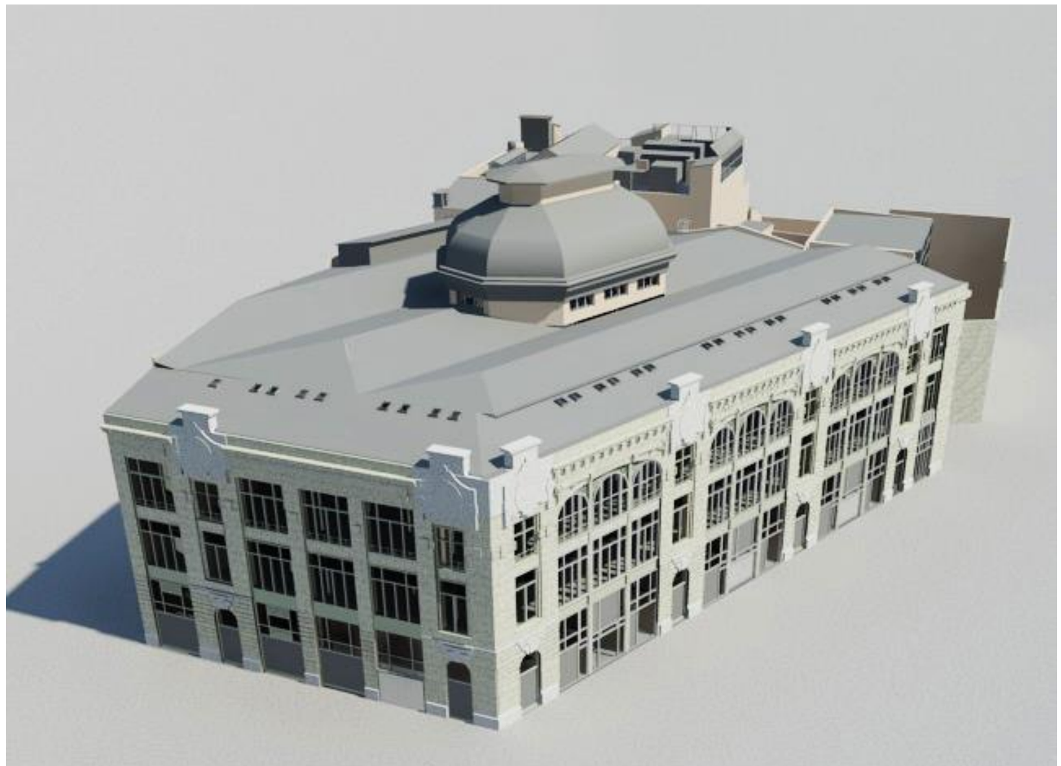
Laser scanning and Point cloud data

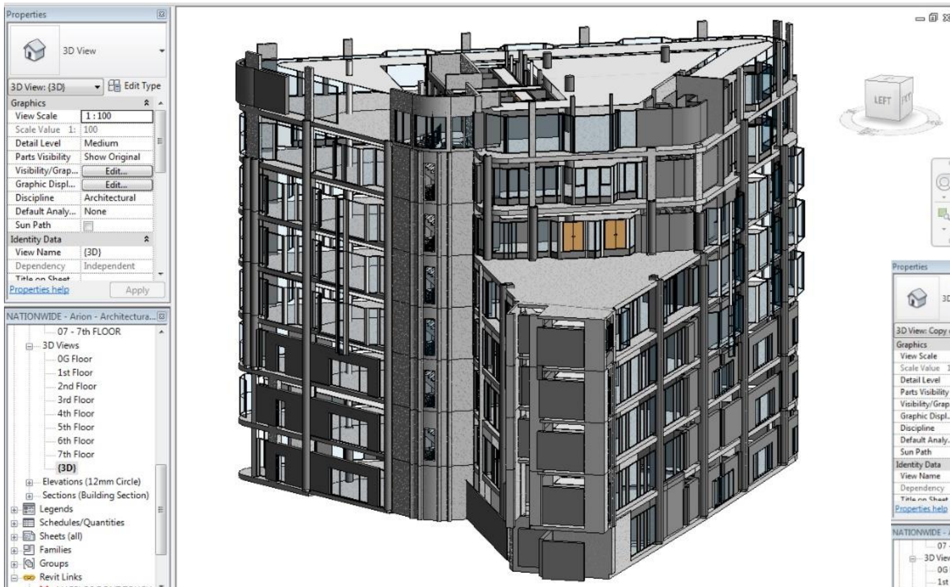
- High level of dimensional accuracy
- Large amounts of site data acquired
- Fast acquisition of site data
- Sharable data online
- Multiple uses for the data

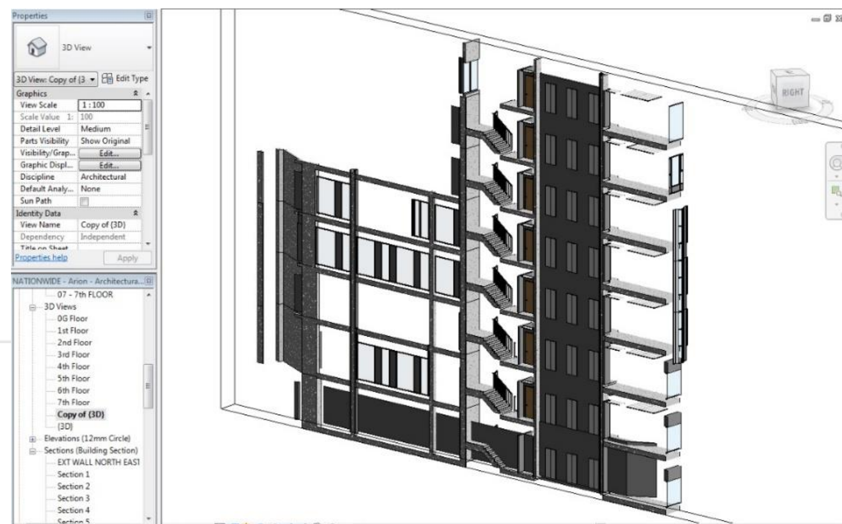
- Single source of truth – data in common

Creation of highly accurate realistic 3D digital models



Data rich 3D lifecycle models informing design, construction and operation





Large scale dimensionally accurate 3D topographic models

The meeting of GIS and GPS

Mapping/GIS
- Paper maps
- Titles, deeds, etc.
- Datasets
- O/S data
- Aerial imaging
- Satellite imaging
- Lidar data

Where accuracy
and measurement has a value

Surveying
- Laser scanning
- Photogrammetry
- GPS
- Total Stations
- Distos
- Tape measures

Data analytics – data accuracy and quality

"Do you realise it would take 400 men at least 250 years to make a mistake this big?"

If high quality data outputs are required the accuracy, quality and reliability of measured data and other database information is critical.

Define Accuracy

ac¦cur|acy
[ˈakjʊrəsi]
NOUN

The quality or state of being correct or precise

Case study 1

Grounds maintenance data capture

Scope of service – Digitisation of Ground Maintenance Data

"Using the location of the site ***based on the current plans,*** and visiting the site and ***identifying the various requirements*** for Grounds Maintenance:

- Land use e.g. Grass Tarmac, Shrub, etc.
- Boundaries: e.g. Hedges, Fences, etc. with heights
- Building type: e.g. 2 storey house, bungalow, etc.
- Other features: e,g, Large trees, spread, etc.

Details of the areas for maintenance will be drafted onto OS plan and ***measured as appropriate***".

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Scope defined

Grass	Area
Attributes	Valid Values
Category	Road Verge, Area Surrounding Housing Development, Other Area
Frequency	4,8,16
Protected_Verge	Yes/No
Naturalised_Bulb	Yes/No
High_Maintenance	Yes/No
Area	Area in m2 (system attribute)
Site ID	Number unique to site - to be taken from database

Shrub Bed	Area
Attributes	Valid Values
Category	Shrub Bed, Individual Shrub Pruning, Rose Pruning, Mulching Only
Area	Area in m2 (system attribute)
Site ID	Number unique to site - to be taken from database

Hedges	Line
Attributes	Valid Values
Category	Top and One Face = T1 or Top and Two Faces = T2
Height	Enter height in metres
Length	Length in metres (system attribute)
Site ID	Number unique to site - to be taken from database

Flowerbed	Area
Attributes	Valid Values
Area	Area in m2 (system attribute)
Site ID	Number unique to site - to be taken from database

Tree	Point
Attributes	Valid Values
Category	Mature Tree (older than 3 years), Immature Tree (less than 3 years old)
Spread	Approx spread in metres
Site ID	Number unique to site - to be taken from database

Rock Salt Bin	Point
Attributes	Valid Values
Site ID	Number unique to site - to be taken from database

Ditch	Line
Attributes	Valid Values
Length	Length in metres (system attribute)
Site ID	Number unique to site - to be taken from database

Winter Edging	Line
Attributes	Valid Values
Length	Length in metres (system attribute)
Site ID	Number unique to site - to be taken from database

Planter	Point
Attributes	Valid Values
Category	Hanging Basket, Christmas Tree
Site ID	Number unique to site - to be taken from database

Site ID Feature	Point
Attributes	Valid Values
Site ID	Autogenerated Number
Post Code	Taken from nearest relevant address point

Hardstanding	Area
Attributes	Valid Values
Category	Tarmac, Brickweave, Concrete, Stone, Paving Stones, Loose Surface (
Site ID	Number unique to site - to be taken from database

Grass	Area
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The methodology

- Review existing data – paper based, scanned
- Preparation of existing information into digital (map) information
- Zoning and agreeing site locations to be visited
- Attend site – visual verification of actual site layout
- Undertake to measure using handheld Distos and tape measures where layout not matching source data
- Visual confirmation of ground classifications: grass, hardstanding, etc.
- Amending digital (map) information to reflect actual site, classifications and conditions
- Quality Control datasets
- Issue completed dataset in .tab file format
- Total cost of exercise £94,250.26 (Approximately £100.00 per property)

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Overview

Location

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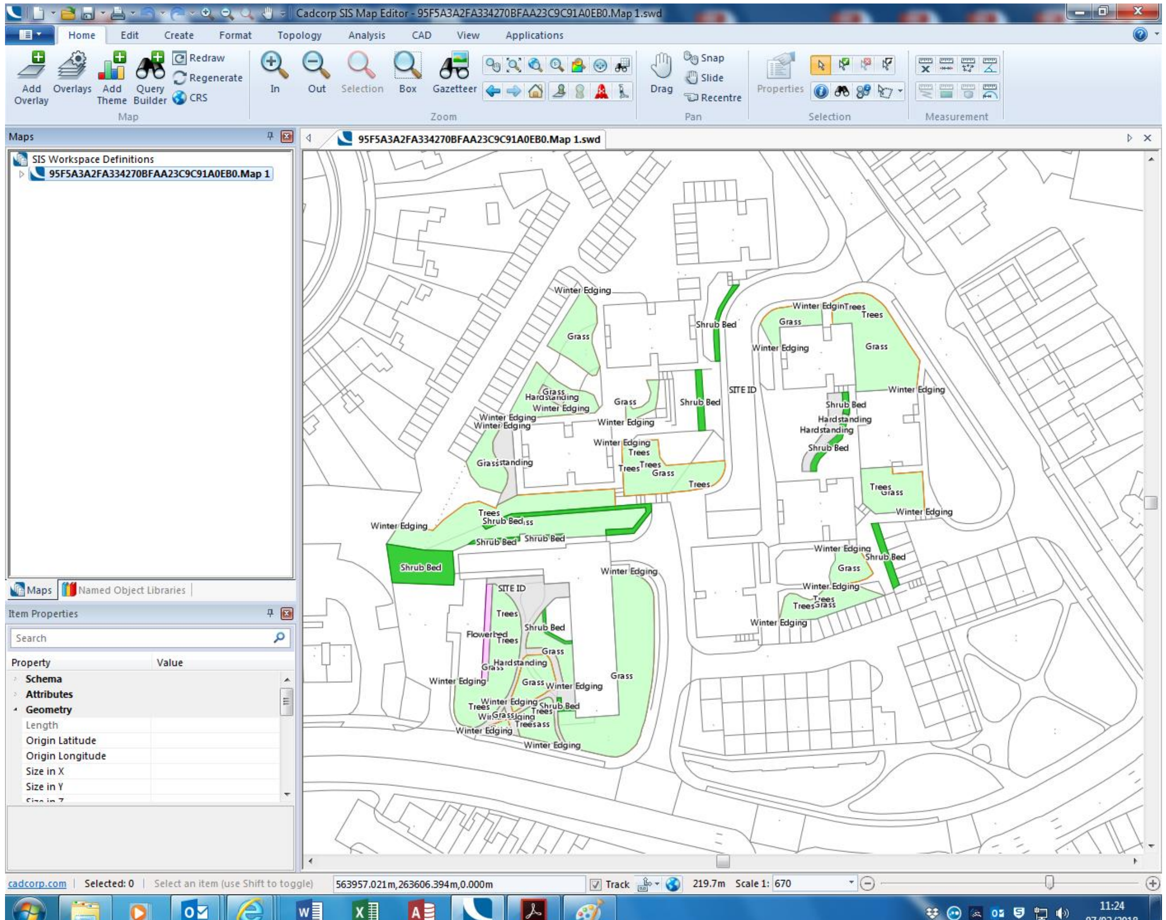
Category's



Data outputs - Areas

Level of accuracy, tolerances

- Target accuracy required was within 25cm
- However, actual accuracy could not be qualified due to inherent tolerances within the source data
- We were not required to undertake dimensionally accurate measurement exercise
- This was deemed to be accurate enough at the time
- If we were doing this now - new technologies, faster data capture methods – Dimensionally accurate to +/- 3mm, built-in GPS with a range in excess of 50m

Issues we face

- Balancing the cost of data acquisition versus cost of data inaccuracy?
- The accuracy was considered to be good enough at the time because it was more accurate than the existing records and methods.
- However, the actual dimensional accuracy remained unqualified
- Managing data - Keeping records up to date.
- Was this future proof? Not considered to be important at the time.
- The data is re-used but how up to date and accurate is it?
- Are the reports correct?
- Can I trust the outputs?

Lets quickly revisit the scope of service

"Using the location of the site <u>based on the current plans</u>, and visiting the site and <u>identifying the various requirements</u> for Grounds Maintenance:

- *Land use e.g. Grass Tarmac, Shrub, etc.*
- *Boundaries: e.g. Hedges, Fences, etc. with heights*
- *Building type: e.g. 2 storey house, bungalow, etc.*
- *Other features: e,g, Large trees, spread, etc.*

Details of the areas for maintenance will be drafted onto OS plan and ***<u>measured as appropriate</u>****".*

Issues our clients face

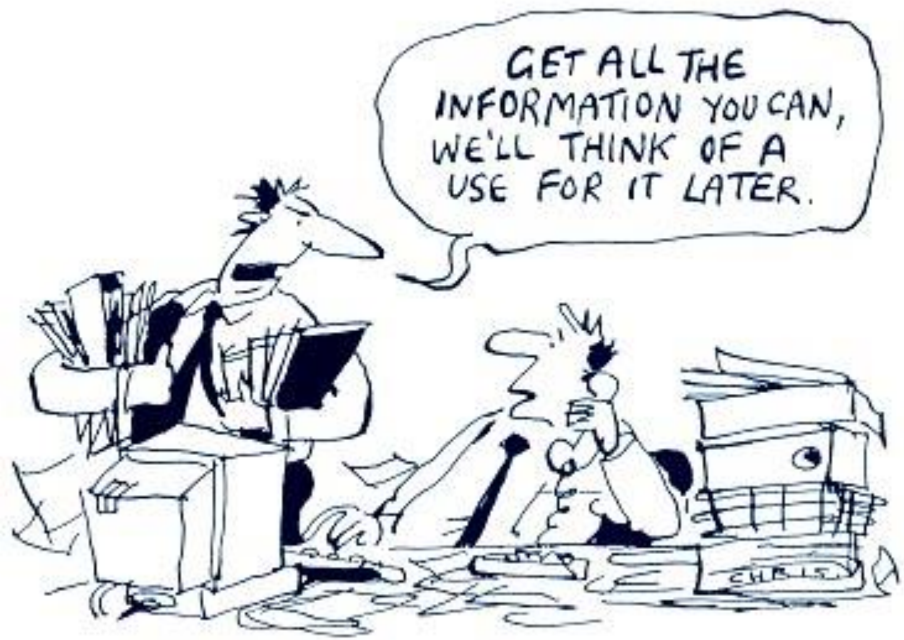
- Surveys are only a moment recorded in time
- Data is like a Rolling Stone - constantly evolving
- Keeping records up to date – live data is becoming business critical
- Use of complex analytics on data collection mean that accuracy and quality of the input is critical to the accuracy of the outputs
- Trust - the reliability of that data must be beyond question
- Sharing and wider distribution of data sources to increasing numbers of users – their needs are not always considered
- Time - Urgency of collecting and preparing the data

Summary

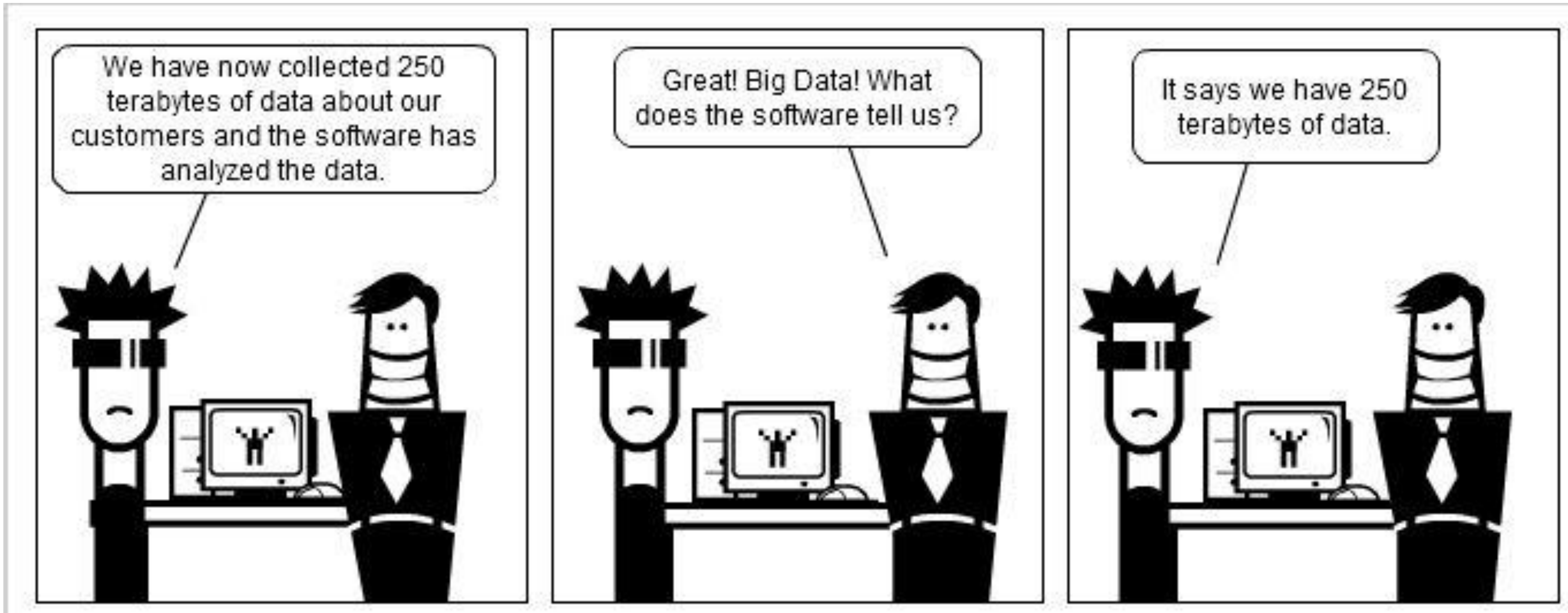
- Clearly defining your required outcomes is more important than defining the process
- Clearly stipulate the accuracy and quality required from the output
- Consult an expert to develop the brief – Their knowledge and experience will be invaluable in helping you to develop the right methodology

Big data

Future-proofing



Big data


We have now collected 250 terabytes of data about our customers and the software has analyzed the data.
Great! Big Data! What does the software tell us?
It says we have 250 terabytes of data.

Data capture

"Maybe you can get what you want,
and also what you need?"