

Eccentric vs Expert-Centric

(what happens in the Sub-Surface workplace?)

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What do “SubSurface Detectives” get paid for?

- *Well, for example, for figuring out:*
 - ✓ *How to increase the Recovery Factor for your producing field*
 - ✓ *How to use an off-the-shelf simulator to tackle the real reservoir you are working on*
 - ✓ *How to find the “sweet spot” in an unconventional reservoir*
 - ✓ *How the petroleum system in a much explored basin actually works*
 - ✓ *Which play or basin your company should enter....*
- *But is this what we do all day?*

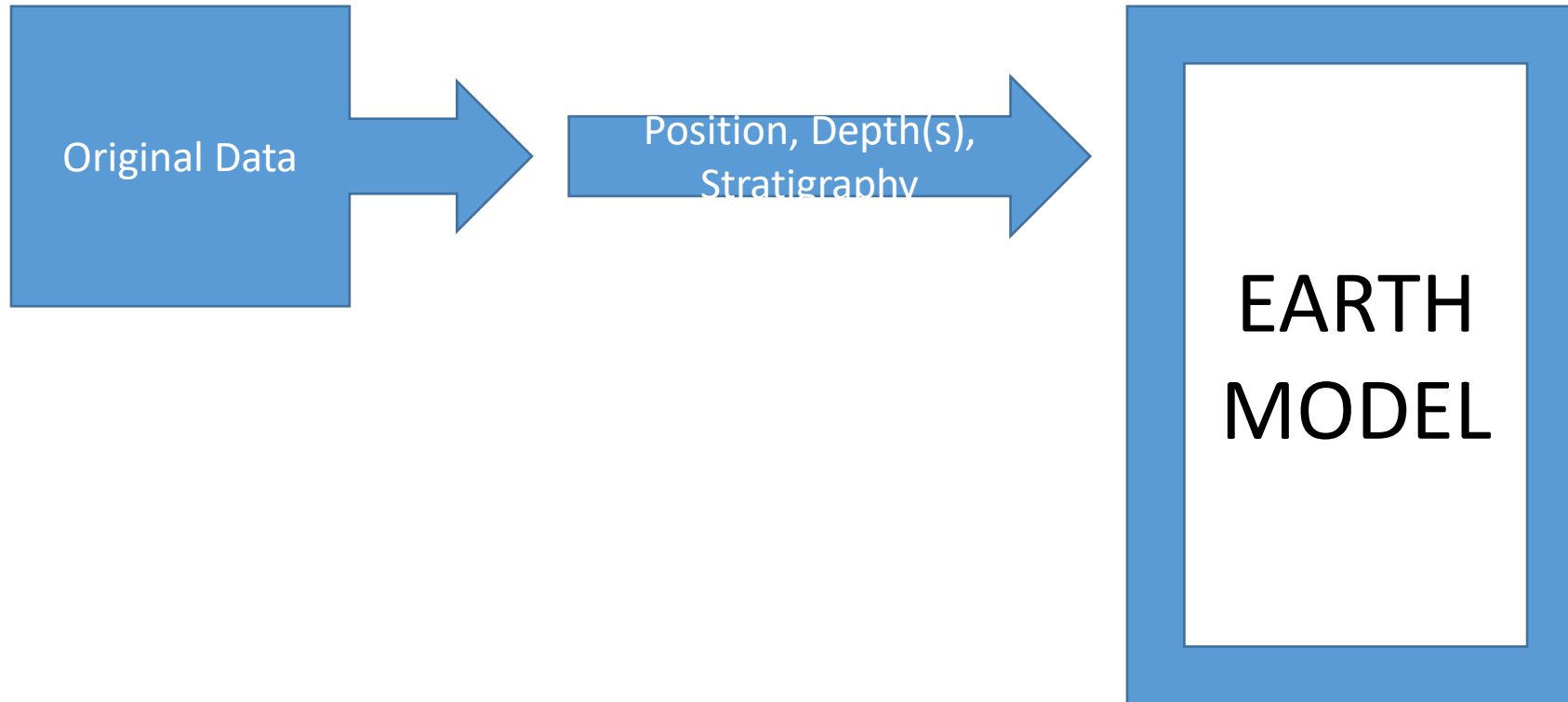
I think we all know the answer is No!

- *Most of the basins/plays/discoveries/fields you will work on will have lots of data available: 'heritage' seismic, well logs, production monitoring, cores, cuttings etc*
- *And who knows where it all is?*
- *And then there are many, many, attributes derivable from all this data that could be useful – porosity, permeability, brittleness, velocity, density, Sw etc etc*

So most SubSurface work obeys an 80/20 rule – 80% is some form of 'drudgery' before we can get to the stuff we are actually paid for!

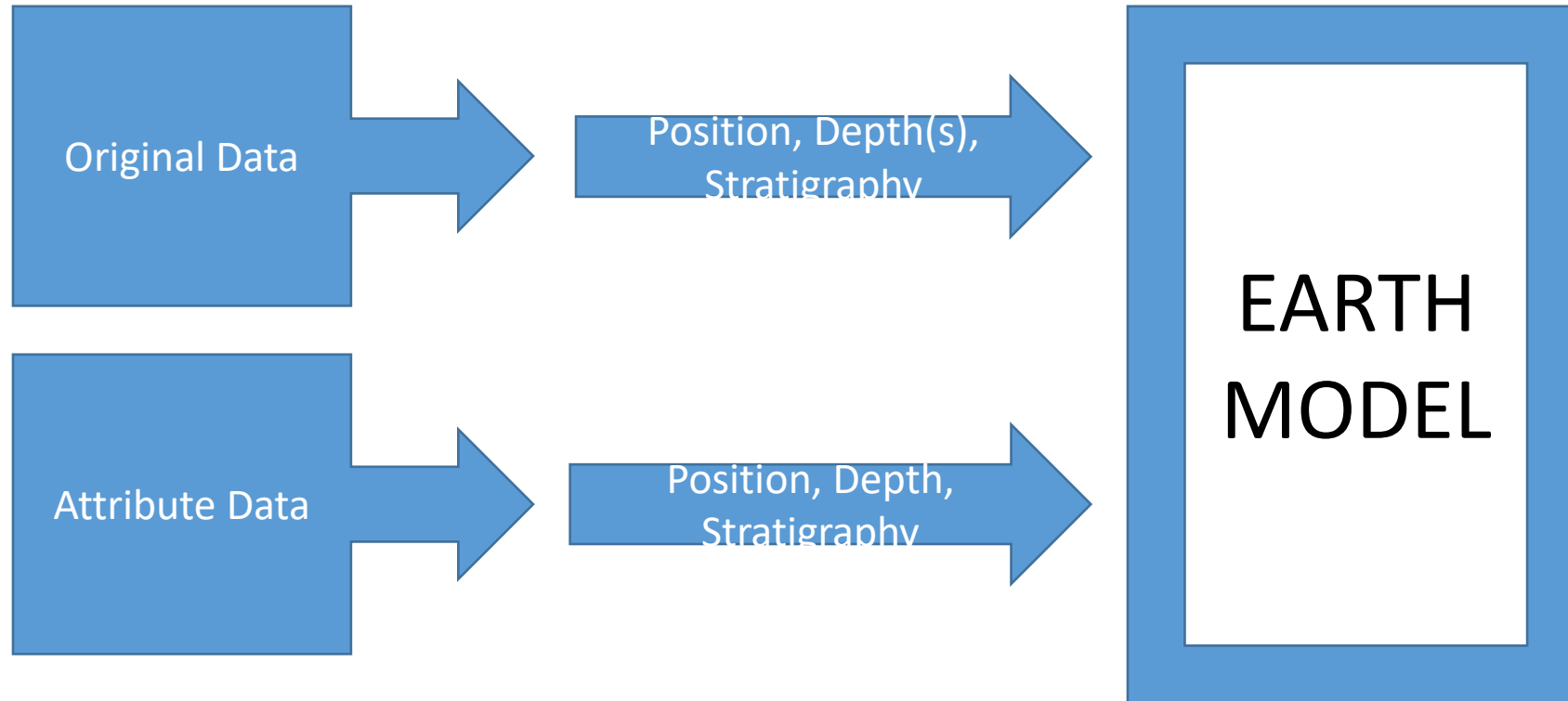
The 'eccentric' view!

Build a 'Model'!



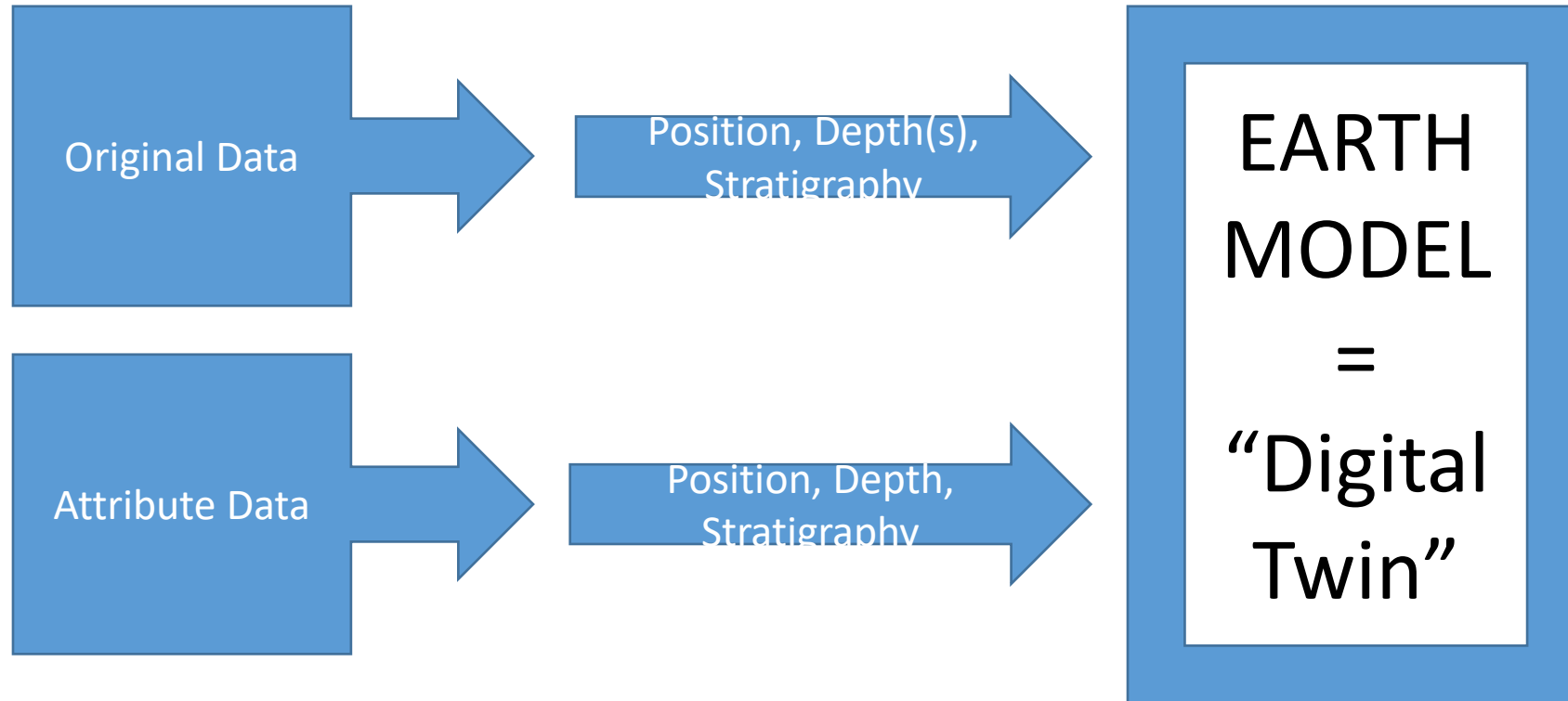
The 'eccentric' view!

Build a 'Model'!



The 'eccentric' view!

"Digital Twin"



How do we build a “Digital Twin” of a basin, field, prospect?:

- ✓ *This is unlike building an engineering “Digital Twin” of an engine, turbine where there is a precisely accurate blueprint.*
 - ✓ *This is unlike building a medical “Digital Twin” of one human body where we know the contents exceedingly well but size and shape differs (enormously).*
 - ✓ *An Earth “Digital Twin” has to be flexible, perhaps start off with the assumption that every one will be different.*
 - ✓ *The one route to this is through the interpretation of 3D seismic data which can deliver a spatial, static, Earth Model replete with depths, geological ages, formations, structures.....*
- *Which is why we spend so much time acquiring, processing and interpreting seismic.....but is this itself “drudgery”?*

There are therefore two issues.....:

- ✓ *Building an Earth Model 'skeleton' from 3D seismic data and well logs:
but this whole exercise – from processing to finished interpretation - takes too much time (and it is too tempting to take 'short cuts')*
- ✓ *Data Management and filling the Earth Model 'skeleton':
solutions are available to do this accurately and quickly.*

A question then: bearing in mind that both seismic data processing and seismic interpretation are 'rules-driven', can high-speed computing transform this work?

An 'Expert' must control and direct this work because:

Domain Knowledge is vital; it's not a good idea to hand the job to somebody from IT or to some 'black box'!

- *This means that the “winning” software will be “expert-centric” i.e. the drudgery will have been removed.....*

And so finally.....

With an Earth Model “Digital Twin”, “SubSurface Detectives” can work 80/20 on what they get paid for!

Figuring out:

- ✓ *How to increase the Recovery Factor for your producing field*
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- ✓ *How to find the “sweet spot” in an unconventional reservoir*
- ✓ *How the petroleum system in a much explored basin actually works*
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Expert-centric Software

THANKYOU

THANKYOU FOR COMING & FOR LISTENING

AND

FEEL FREE TO TAKE NO NOTICE AT ALL!!