

Data Integration for Predictable Project Outcome “Keeping the Estimate Alive”

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Meet Our Speaker (Author)

Jan Willems

Project Controls Director

- ▶ Global experience for over 35 years in the business of Project Controls across industries
- ▶ Almost 30 years with Fluor in Project Controls – Planning, Cost, Estimating
- ▶ Strong focus on Automation and Integration
- ▶ Currently Global SAP Support, Global Master Data Manager and Tool Development/Integration Lead on our major Business Transformation initiative
- ▶ Fluor Fellow in Data Integration
- ▶ jan.willems@fluor.com



Meet Our Speaker (Presenter)

Anton van der Steege, CCP

Project Controls Director

- Mechanical Engineer started in Metals industry and moved to Project Management in 1997
- Almost 20 years with Fluor in Project Controls – Cost Management
- Focus on Data Sharing and Integration between systems and tools
- Currently Global Cost Lead and Fellow in Cost Management for Fluor
- Serves on DACE Board / SIG CEPI
- anton.van.der.steege@fluor.com

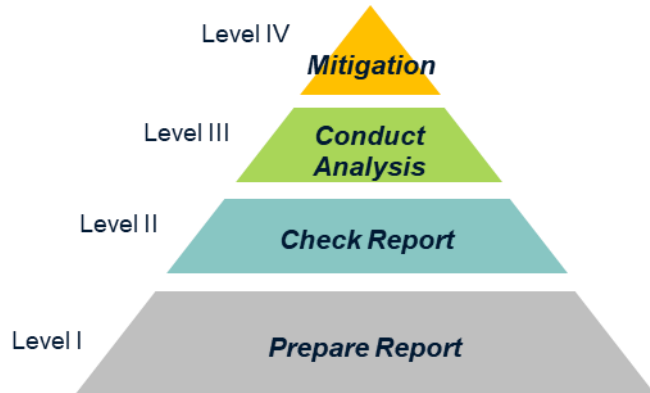


UNPREDICTABLE OUTCOME COSTS BILLIONS IN INVESTMENT AND PRODUCTION LOSSES

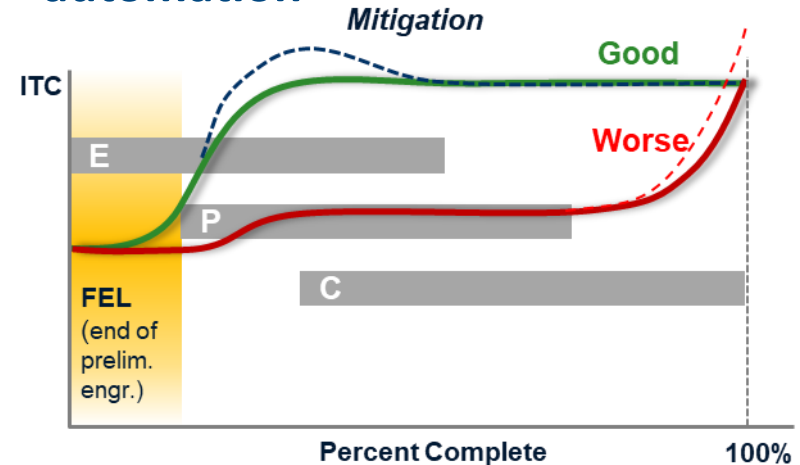


We Don't Spend Effort where we Should

- ▶ 80 % of Project Controls' time is spent on gathering and cleaning data
- ▶ 15 % is spent on making the data look nice
- ▶ 5 % is for analysis and mitigation

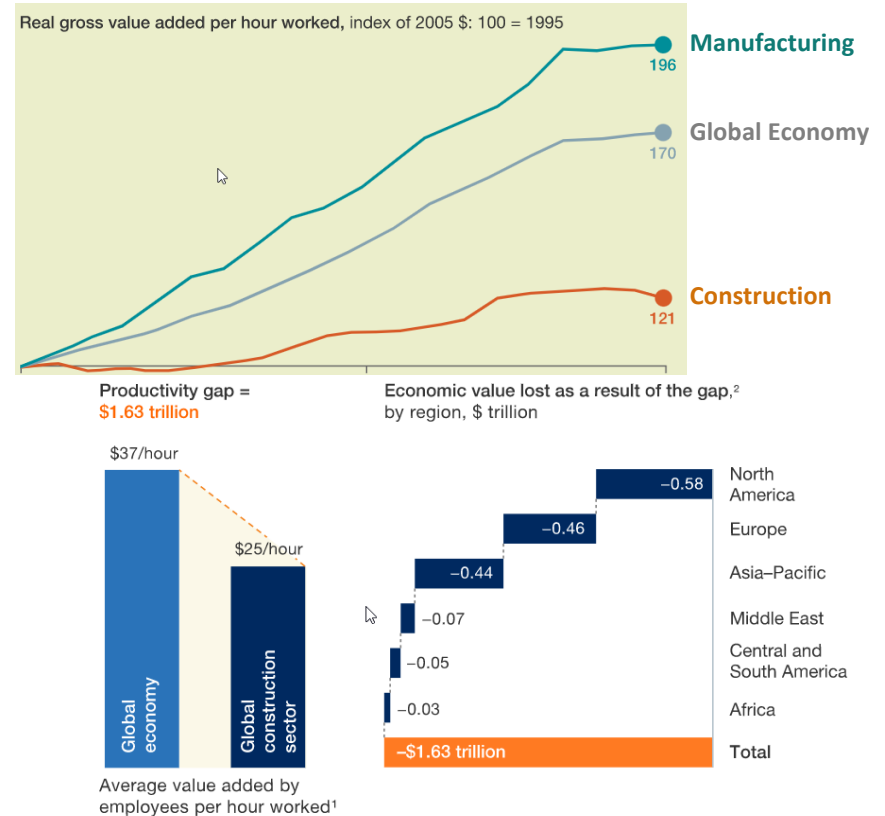


- ▶ Early fixes are “Better, Faster, Cheaper”
- ▶ Setup is key but often overlooked
- ▶ Large data volumes beg for automation



Our Industry is not a Stellar Performer ...

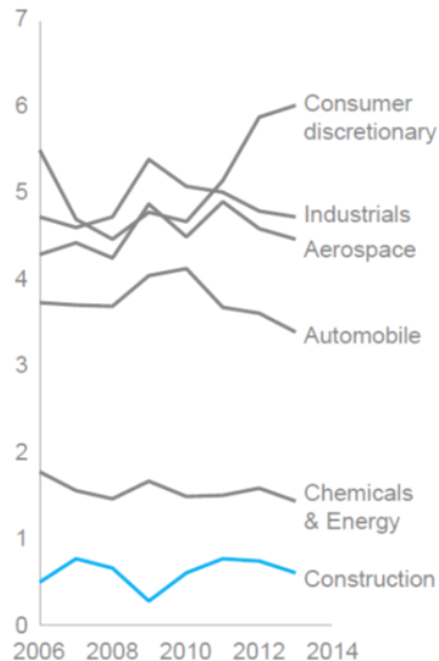
- ▶ The Engineering and Construction Industry has not jumped on the improvement train.
- ▶ Other sectors have seen dramatic increases in productivity.
- ▶ Our Clients have seen this and do not understand why we are not there yet.
- ▶ McKinsey study only ranks Agriculture and Hunting lower than us ...



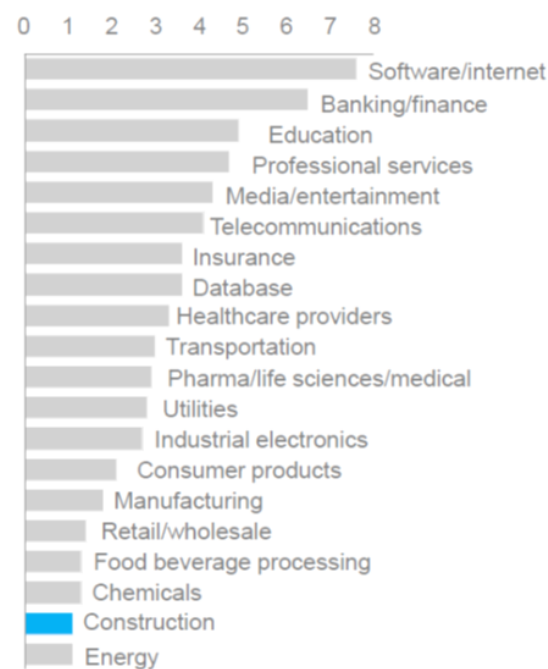
and we Tend to be Stingy too ...

- ▶ It has always worked that way and I know how to do it.
- ▶ Why do we need this new stuff?
- ▶ I don't have time/budget/people/... for this.
- ▶ Let the guy from Document Control build a dashboard!!!

Construction is the lowest spender on R&D across select major industries
% of Revenue spend on R&D



Spend on IT is 1%, which is among the lowest across all sectors
% of Revenue spend on IT

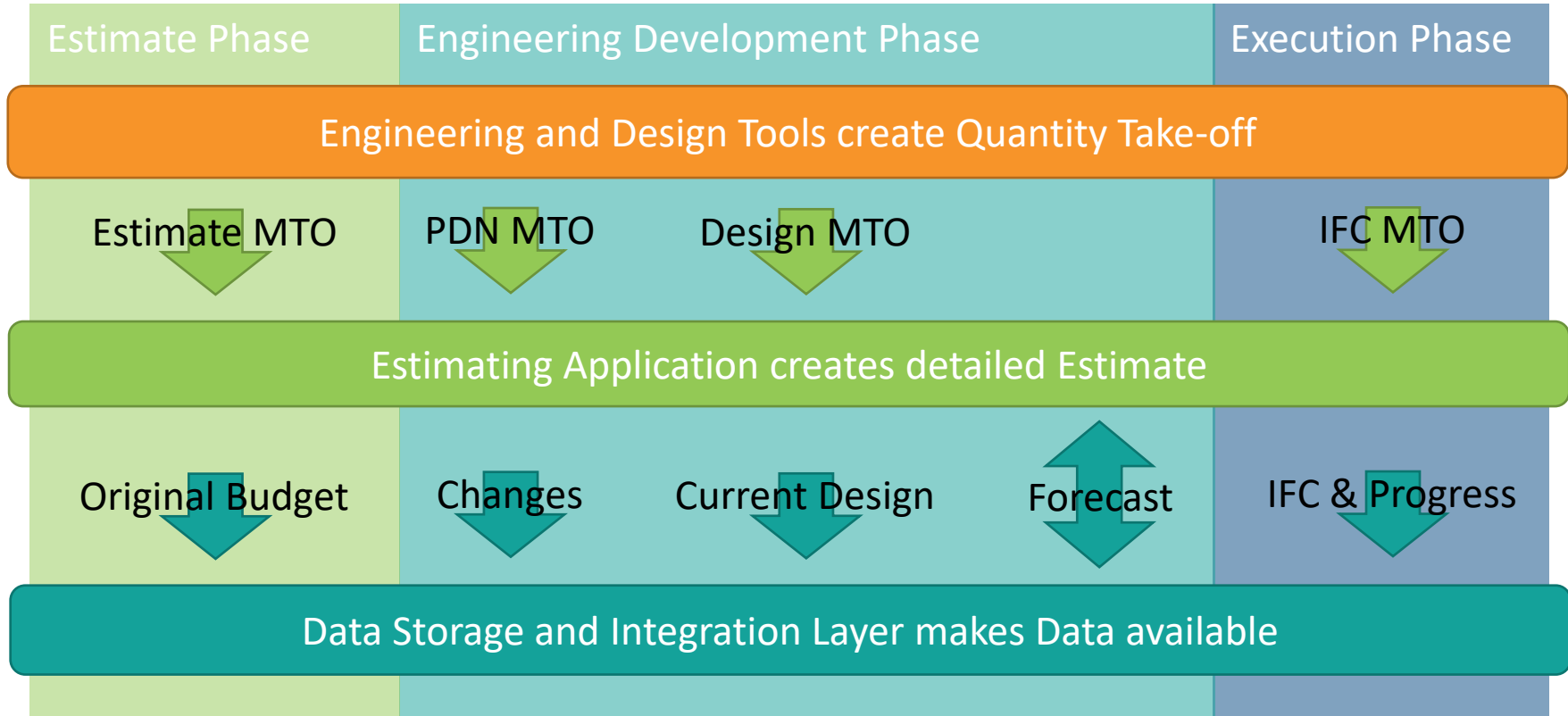


IMPROVE CONTROL OF KEY PROJECT SUCCESS FACTORS BY **CONTINUOUS MONITORING AND FORECASTING**

Keeping the Estimate Alive



Keep the Estimate Alive!



Keeping the Estimate Alive

- ▶ The process looks simple and straightforward
- ▶ And basically, it is ...
- ▶ But it takes a lot of work to build an environment to make it possible, this is what we will talk about today



DATA INTEGRATION IS REQUIRED TO IMPLEMENT THE PROCESSES TO ACHIEVE PREDICTABLE OUTCOME

Easier Said than Done ...



Do not Automate a Bad Process with Lousy Data

“Automating a mess yields an automated mess.”

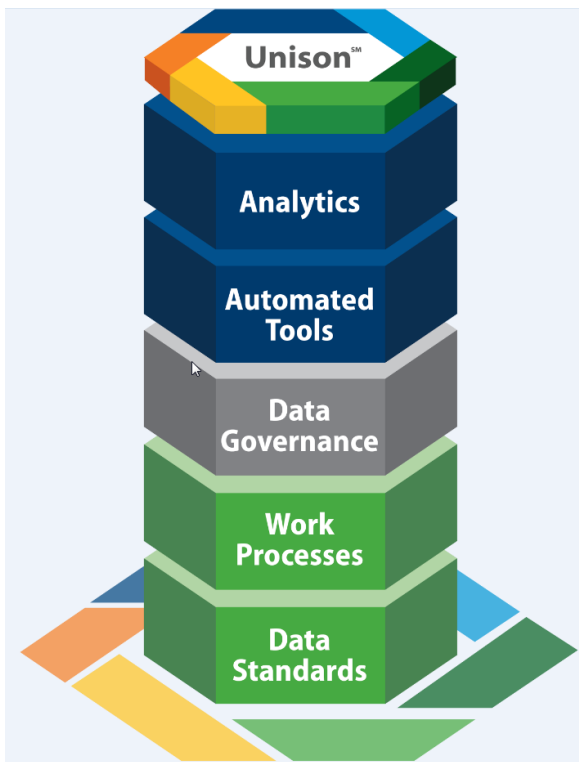
“Heavy investments in information technology have delivered disappointing results – largely because companies tend to use technology to mechanize old ways of doing business.”

“Instead of embedding outdated processes in silicon and software, we should obliterate them and start over.”

Michael Martin Hammer (13 April 1948 – 3 Sept 2008)
was a Jewish-American engineer, management author,
and a former professor of computer science at MIT



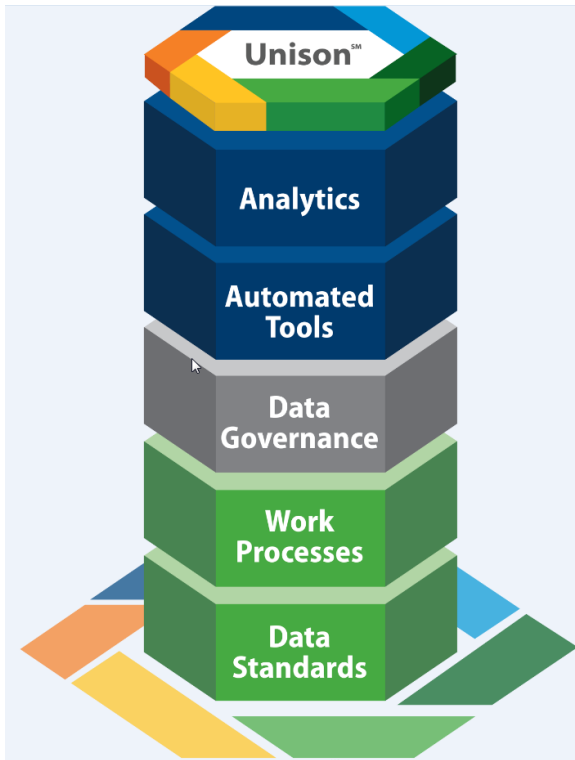
TOP-Down – The EASY ROAD



- ▶ Buzzwords and Graphics
- ▶ “Quick Wins”, instantaneously pleasing management
- ▶ Doomed to fail, but some get rich on prolonging the problem
- ▶ Building dashboards and analytics on top of bad data only advertises how bad your data is ...



THE ROAD LESS TAKEN ... *(it makes all the difference)*



- ▶ Experience with IBM Watson
- ▶ Needed to build a foundation of standardized data resulting from standardized work processes
- ▶ *Reculer pour mieux sauter*
- ▶ As solid foundation and backbone for using attributes in classification.

Coding is not Reliable

- ▶ **This is a DOG**
- ▶ **It is a dog because someone CODED it as a dog**
- ▶ **If we feel it does not really look like a dog, we can:**
 - Correct the coding
 - Map/transform the incorrect coding to what we think it should be
 - Dump it all in Excel and do our own thing as you can never trust others ...



Let's bring in Attributes and Classification

- ▶ By introducing attributes we can determine the object based on classification and taxonomy.
- ▶ Classification relies on agreed attributes that determine the object
- ▶ Attributes should be defined as part of the standard process, otherwise they just become a more complex type of CODING.



Attribute Defines	FISH	DOG
Legs	0	4
Tail	Yes	Yes
Skin	Scales	Fur
Breathing	Gills	Lungs
Body Temperature	Cold	Warm

Attributes Need to be Exhaustive

- ▶ If attributes are not sufficient to uniquely classify an object in the taxonomy, they are not exhaustive enough.
- ▶ This can lead to confusion and inaccuracy.
- ▶ If the attributes do not exclusively define the object to the level of detail required, additional attributes need to be defined.



Attribute Defines	DOG??	DOG
Legs	4	4
Tail	Yes	Yes
Skin	Fur	Fur
Breathing	Lungs	Lungs
Body Temperature	Warm	Warm

Define the Correct Number of Attributes

- ▶ We need to determine the minimal number of attributes required .
- ▶ These attributes should be defined and agreed early on and should be resulting from an approved data entry work process – no excessive additional “coding”.



Attribute Defines	CAT	DOG
Legs	4	4
Tail	Yes	Yes
Skin	Fur	Fur
Breathing	Lungs	Lungs
Body Temperature	Warm	Warm
Sound	Meow!	Arf!
Happy	Purrs	Wiggles Tail

Define the Correct Number of Attributes

- ▶ When attribute values can be added freely, no business rules can be determined to properly classify objects.
- ▶ Controlled and governed data is key to successful, automated classification.



Attribute Defines	CAT	UNKNOWN
Legs	4	4
Tail	Yes	Yes
Skin	Fur	FLUFFY!!!
Breathing	Lungs	Lungs
Body Temperature	Warm	Warm
Sound	Meow!	Meow!
Happy	Purrs	Purrs

Dogs, Cats, and Fish on Projects

- Attributes allow for client naming conventions to determine average prices, unit effort, quantities and all other activities on the attribute which because material attributes are used for automation

Shell Project Export

V	W	X	Y	Z	AG
QTY REQUIR	AVG UNIT PRJ	EST CATEGORY	EST MATL GRADE	EST ENDS	SIZE 1
0.20	66.20	Pipe	CS	Beveled end	14

Marathon Project Export

QTY REQUIR	AVG UNIT PRJ	EST CATEGORY	EST MATL GRADE	EST ENDS	EST MANU METHOD
10.00	66.20	Pipe	CS	Beveled end	Seamless

Value Added Info
Same Across Projects

WEIGHT	RIB ITEM CODE	RIB ABBREV DESCR	TOBEINSTALLED
287.7	84.07V10XXXX.S-14IN	Pipe;CS;S-40;Beveled end;S-14IN	10

POSC/CESAR
MESC
STEP
ISO 10303
ISO 14224
ISO 15926
ISO 19008
CFIHOS
CSI
DIN 276

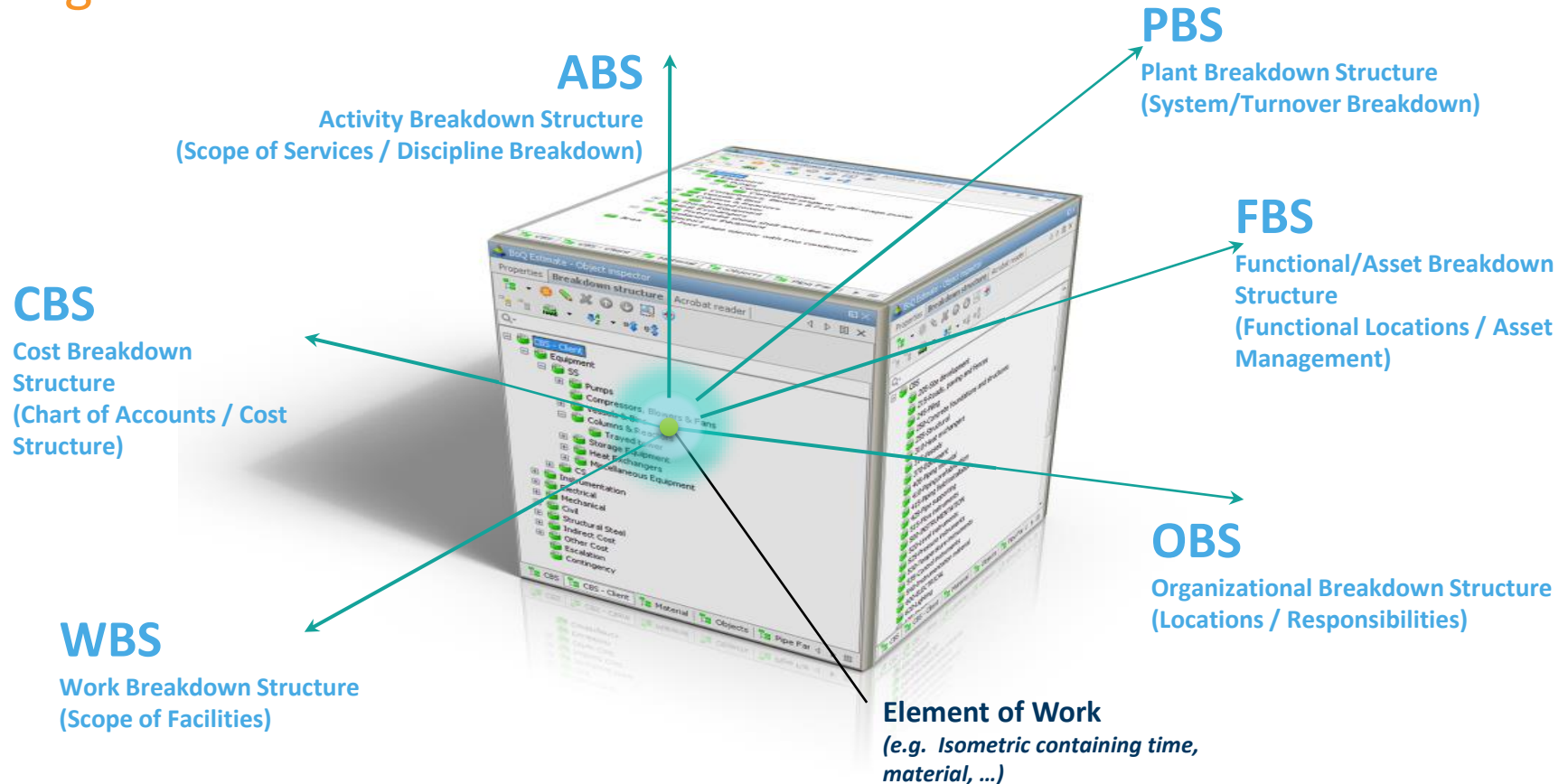
What does this do for the Concept of “Attribute Driven Classification”

- ▶ **Create multiple standardized Classifications for different purposes.**
 - Can classify the objects based on (a combination of) attributes
 - Stores the Class as a separate, identifiable attribute on each record
 - Allows for aggregation, sorting, filtering and database actions
 - Not only multiple classifications, but also multiple levels of Classification can be created. They can be related or not.
- ▶ **Multiple “Orders” of Classification**
 - Starting at the detailed attribute level
 - Multiple, subsequently higher order classifications aggregate details



Multiple, Parallel Classifying Hierarchies

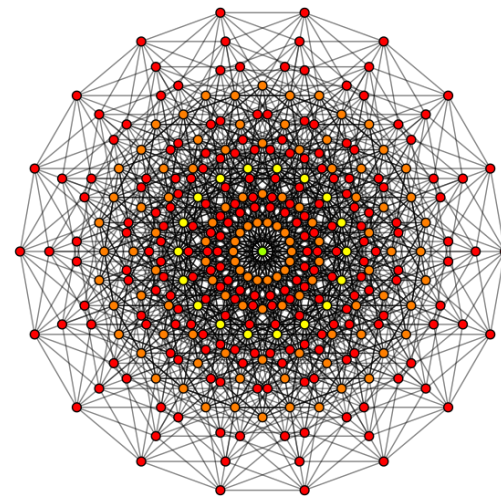
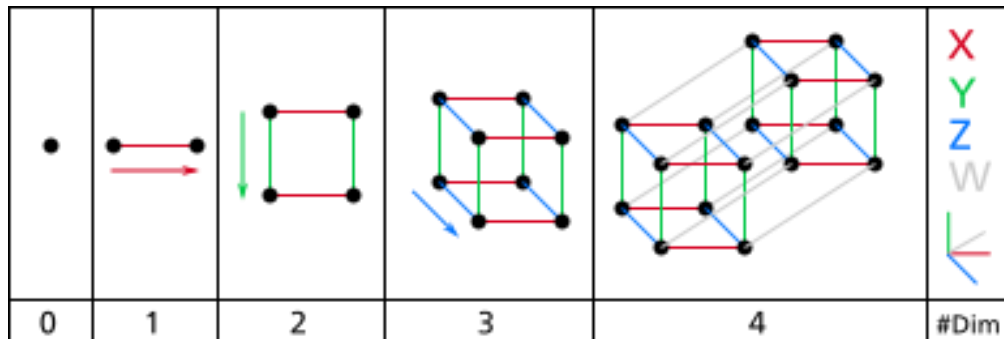
e.g. Breakdown Structures





Welcome to n-Space ...

- ▶ Multiple, parallel, hierarchical structures
- ▶ Driven by Classification and not Coding
- ▶ Universally applicable, endless combinations and permutations in reporting and analysis



Questions

