

3DMC 2017 – 3D Metrology Conference

Aachen, Germany

<http://www.3dmc.events/>

October 9-11, 2017

Daniel Campbell

QIF Working Group, Chairman

Member, Board of Directors, DMSC

Director of Business Development, Capvidia



QIF: Quality Information Framework

What is **ANSI QIF**?

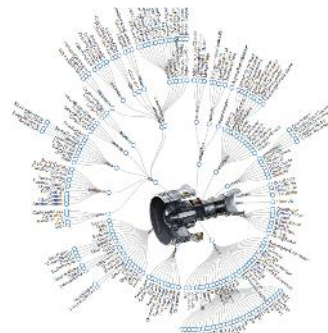
An overview

What is QIF?



Feature-Based Ontology
of Manufacturing Quality
Metadata

XML Technology:
Simple Implementation
and Built-In Code
Validation



Data semantically linked
to Model for full data
traceability to CAD

QIF Application Areas



Workflow Example



Process Stage 1:
Search the PMI applied to the QIF MBD model, and identify the necessary measurement tasks.
This list of tasks is called a Bill of Characteristics

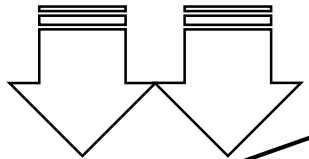
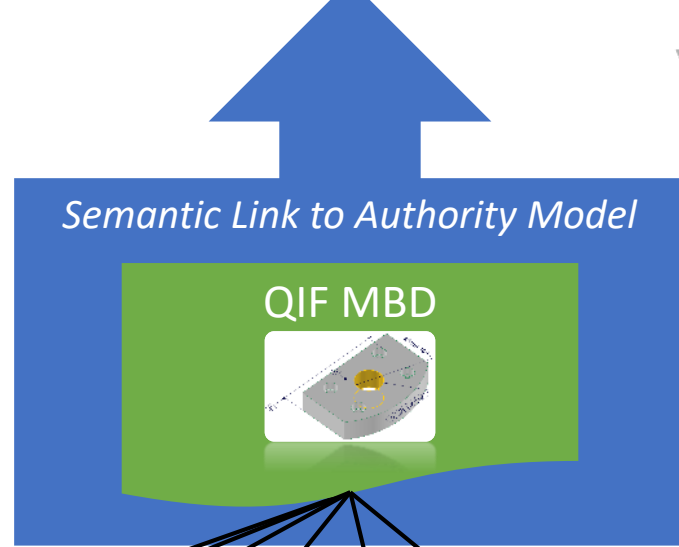
Process Stage 2:
Using a set of organizational Measurement Rules and a list of available Measurement Resources, assign measurement resources to measurement tasks.

Process Stage 3:
Generate a DMIS inspection program from the high level plan for any CMM measurement tasks that have been assigned.

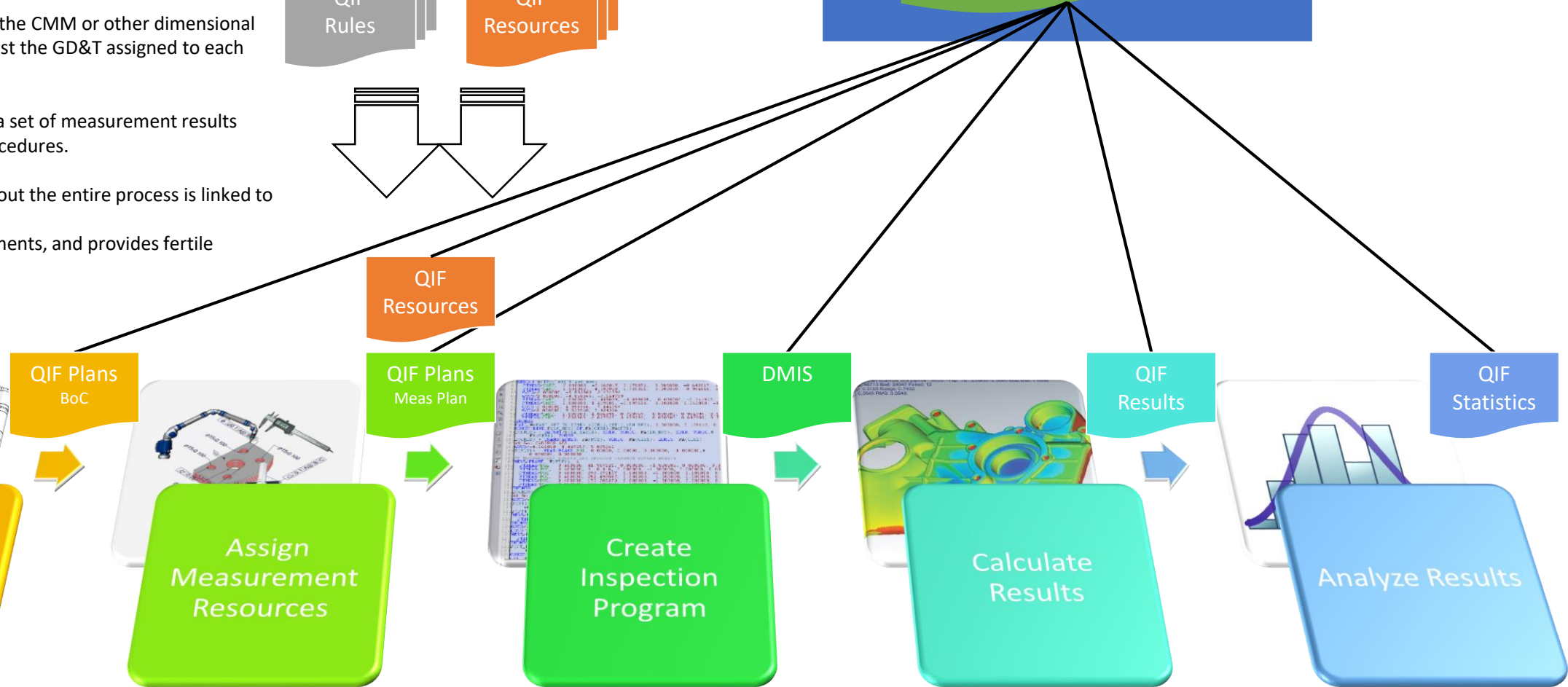
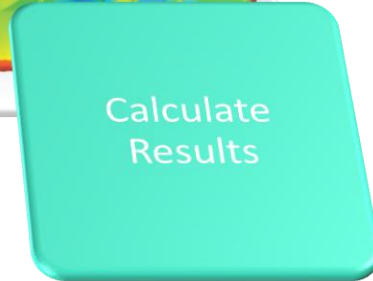
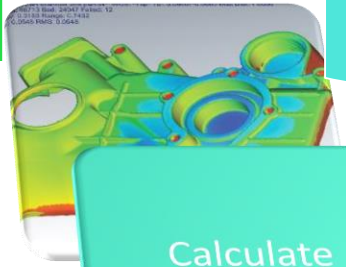
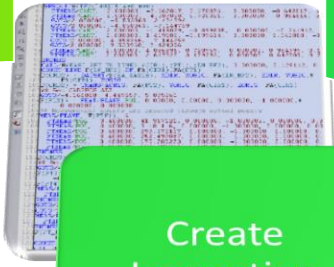
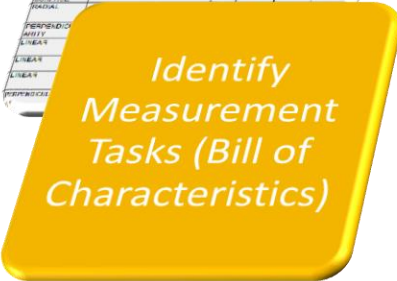
Process Stage 4:
Evaluate the point clouds from the CMM or other dimensional measurement equipment against the GD&T assigned to each feature.

Process Stage 5:
Carry out statistical analysis of a set of measurement results according to organizational procedures.

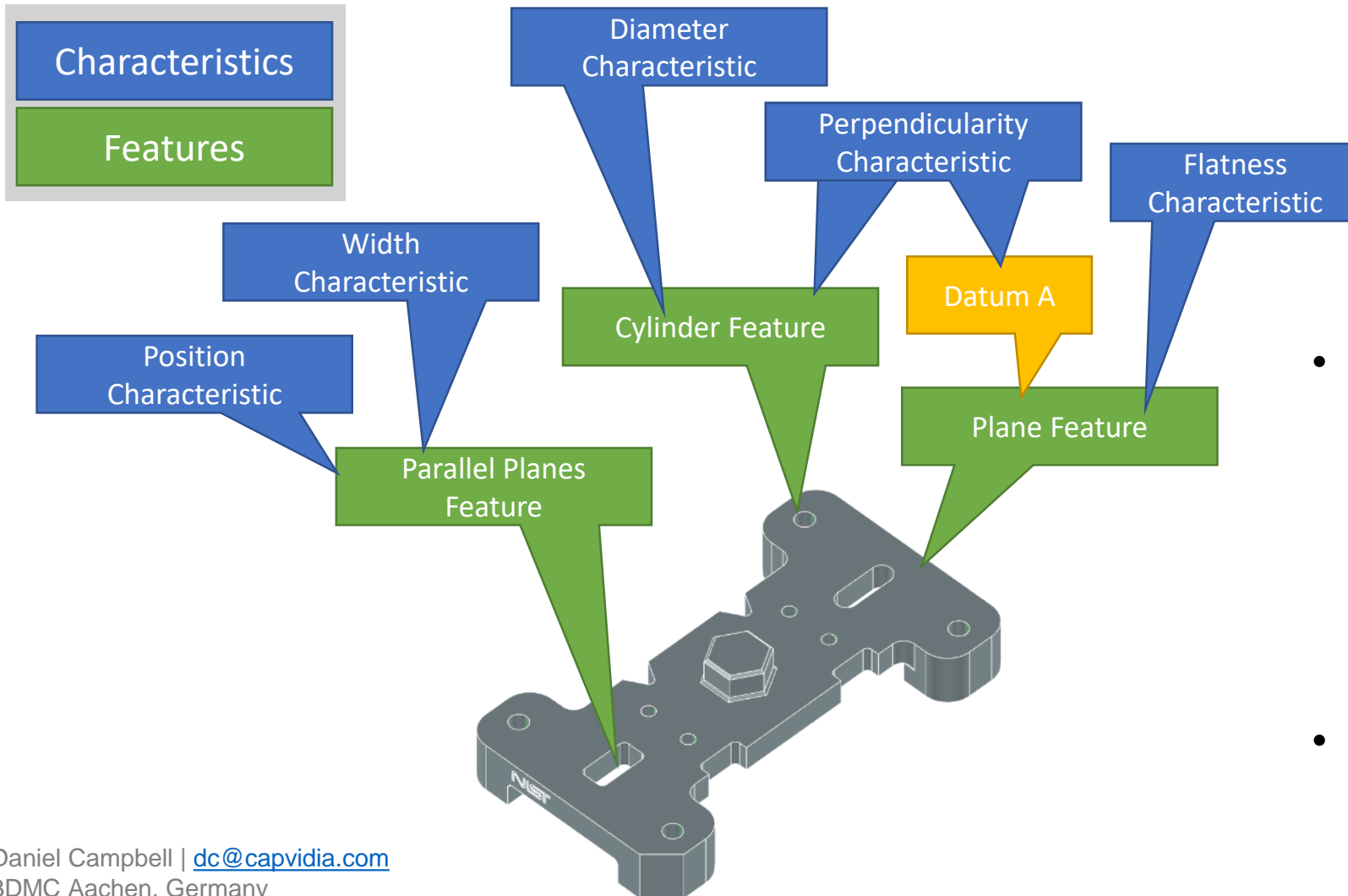
All QIF data generated throughout the entire process is linked to the authority model.
This fulfills traceability requirements, and provides fertile opportunities for data mining.



Characteristic	Measure	Min	Max	Units	Priority
LINEAR	ANNOZE BLUE PER XYZ-26	0.775	0.730	0.02	1
LINEAR	7204.020	0.760	0.660	0.02	1
LINEAR	4181.020	0.508	0.480	0.02	1
ANGULAR	3254.020	0.348	0.330	0.02	1



Features & Characteristics



The fundamental constructs behind QIF:
Features & Characteristics

- CAD geometry is wrapped by **Features**
 - Different concept from CAD features!
 - Sometimes referred to as:
 - Tolerance Features
 - Metrology Features
 - Measurement Features
- Features are referenced by **Characteristics**
 - Usually, these are GD&T

Digital Transformation of Industry

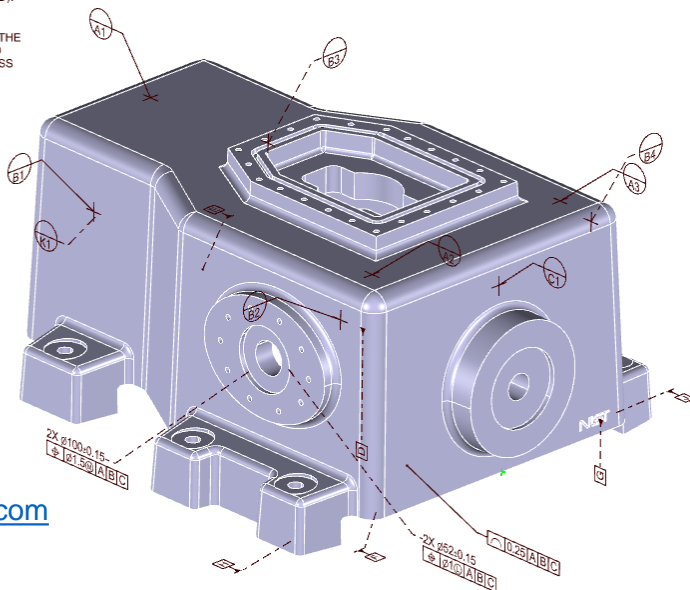


These are all about using DATA to solve
business problems
(Data, not software)
It's all about **Digital Transformation**

Model Based Definition (MBD)
Model Based Enterprise (MBE)
Industry 4.0
Digital Enterprise
Advanced Manufacturing Enterprise
Digital Twin
Digital Thread
Digital Tapestry

NOTES (UNLESS OTHERWISE SPECIFIED):

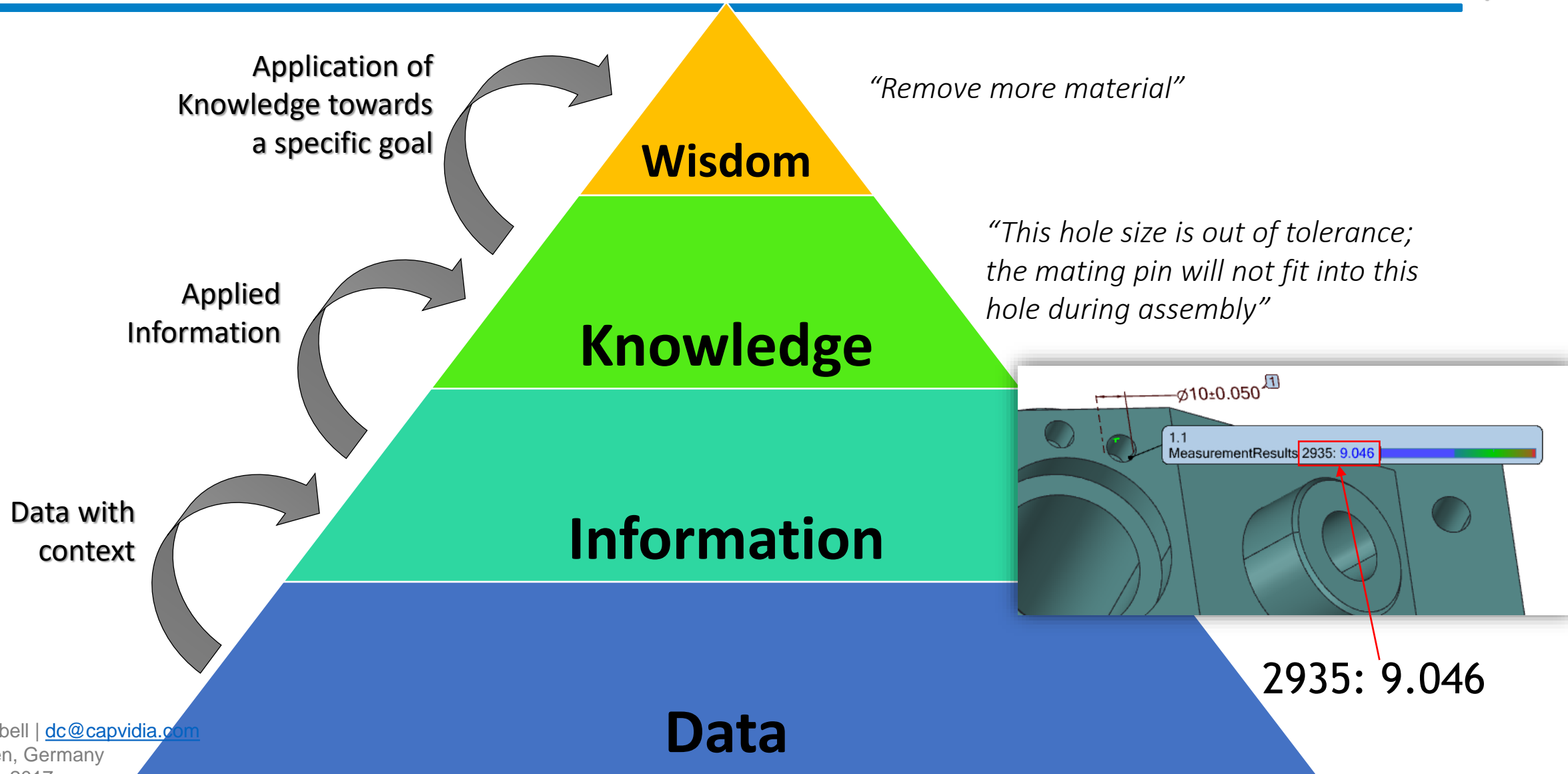
1. OBTAIN DIMENSIONS FOR ALL UNDIMENSIONED FEATURES FROM THE MODEL. ALL DIMENSIONS OBTAINED FROM THE MODEL ARE BASIC UNLESS OTHERWISE SPECIFIED.
2. ASME Y14.41-2003 APPLIES TO DATASET.
3. ASME Y14.5M-1994 APPLIES TO DIMENSIONING AND TOLERANCING.



Not all data is created equal. Consider:

dat txt tif csv xls
pdf xml prt stp jt

DIKW Pyramid & QIF



DIKW Pyramid & QIF



*Without **context**,
data cannot be
transformed into
knowledge.*

*QIF provides this
context.*

Wisdom

Knowledge

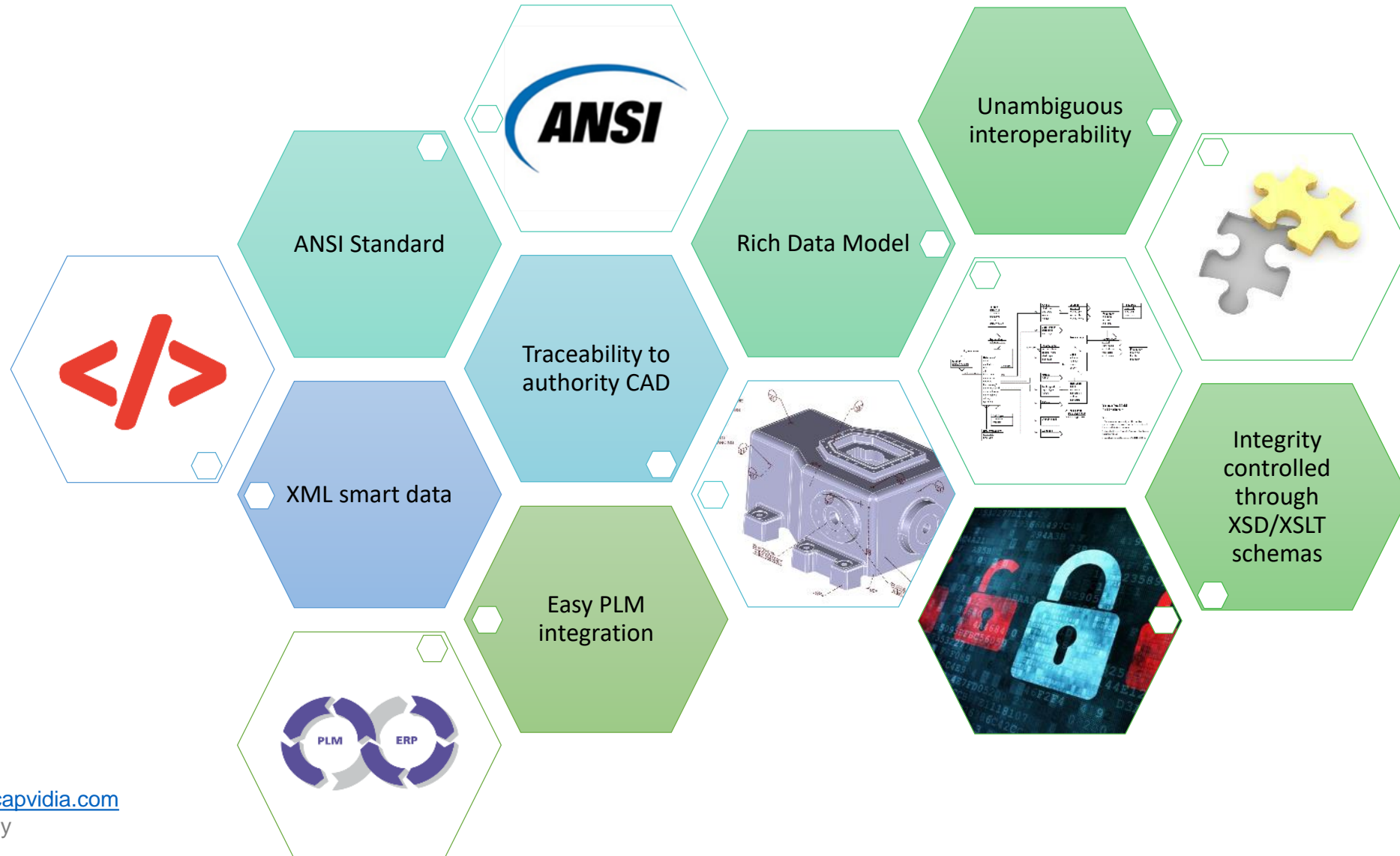
Information

Data



Raw Measurement Data

QIF Benefits



DMSC Members



Thanks!



Contact me:

Questions?

Daniel Campbell
QIF Working Group, Chairman
Member, Board of Directors, DMSC
Director of Business Development, Capvidia

*Dimensional Metrology
Standards Consortium*

DMSC



CAPVIDIA