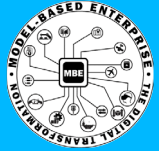


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Hybrid Standards and Ad-hoc Approach to Balance Near Term Needs with a Long Term Information Assurance Vision

Ben Kassel

Visiting Principal Faculty Specialist

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301 226 8873

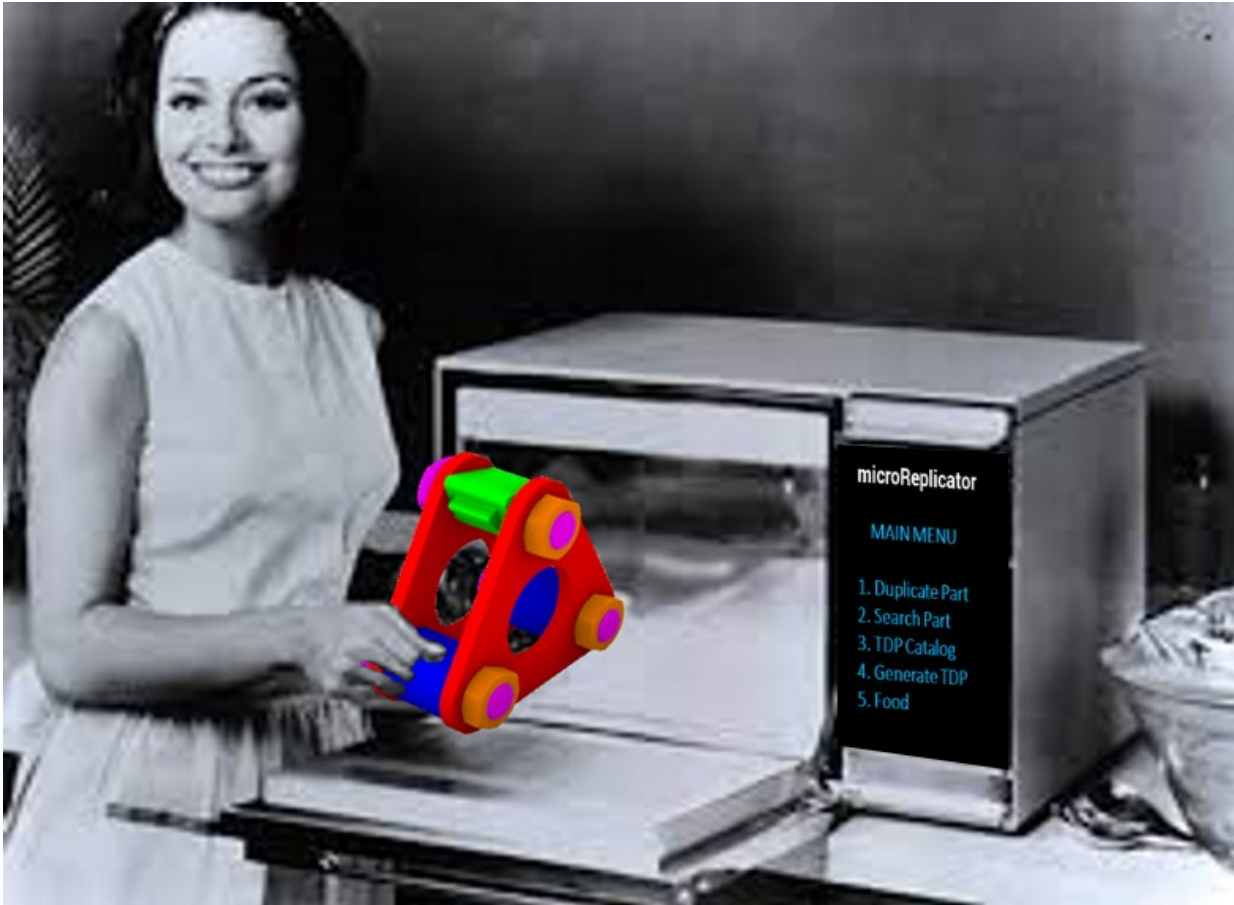


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Our entire manufacturing future is the vision of Bradbury, Asimov, Clark, and Roddenberry



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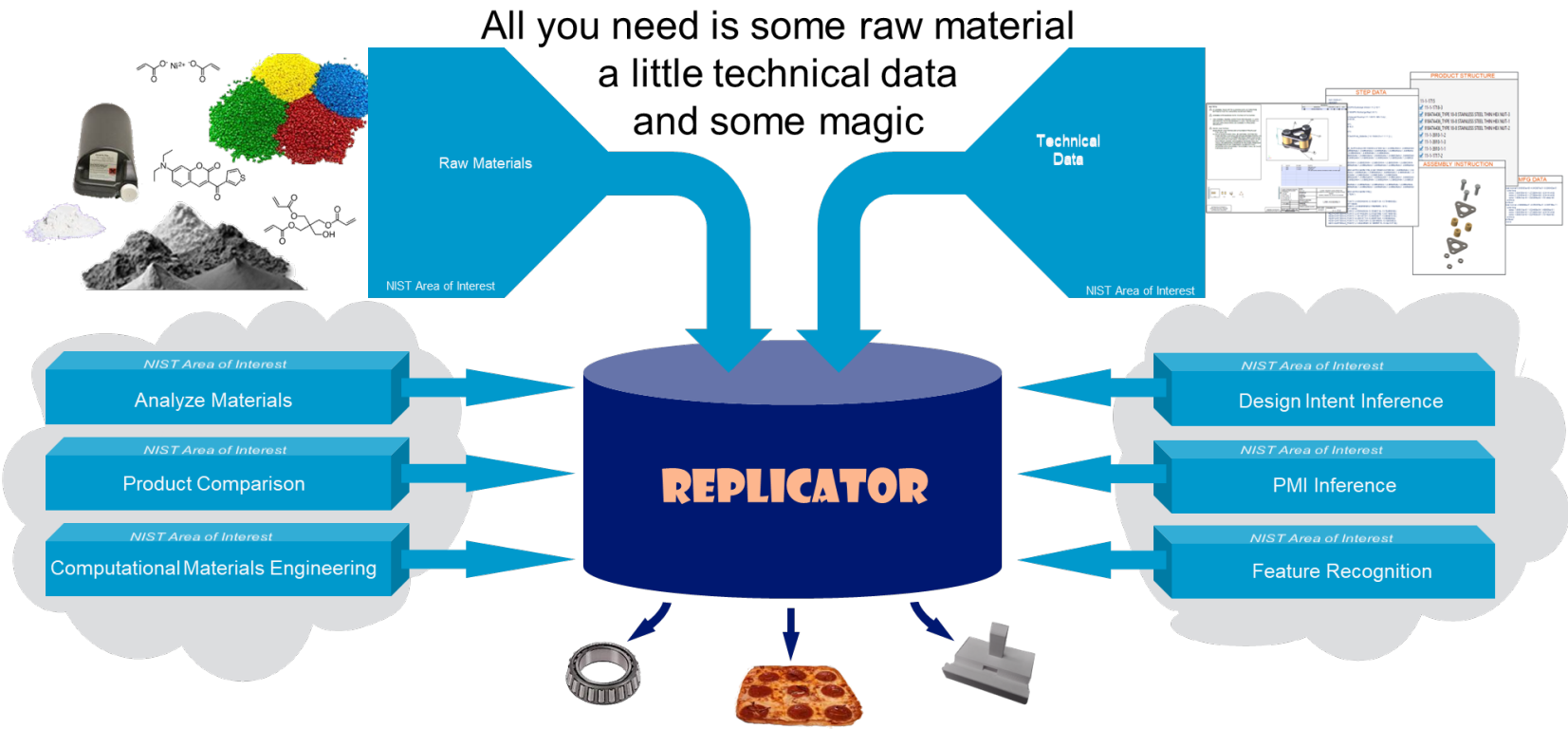
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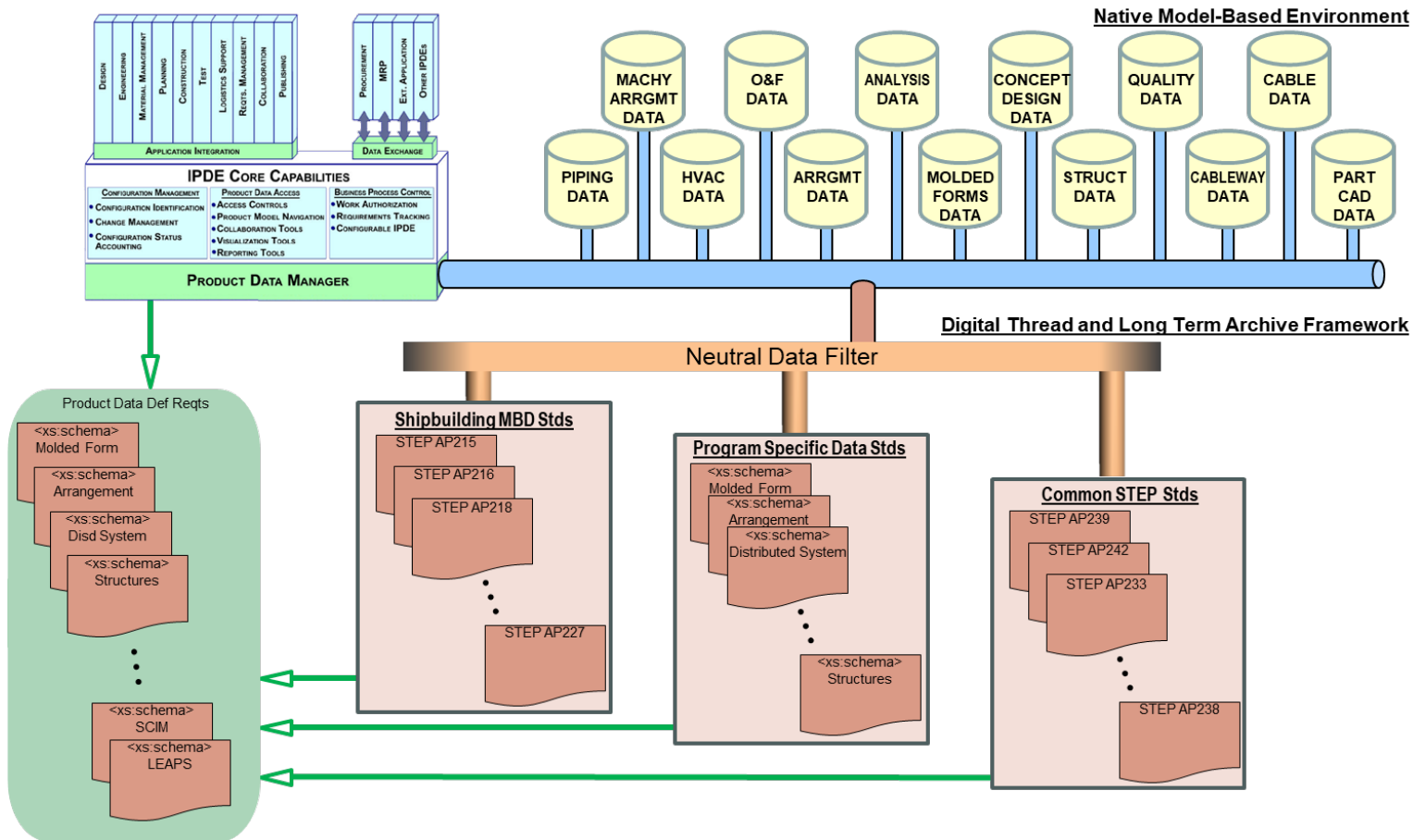
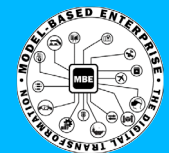
Our entire manufacturing future is the vision of Bradbury, Asimov, Clark, and Roddenberry



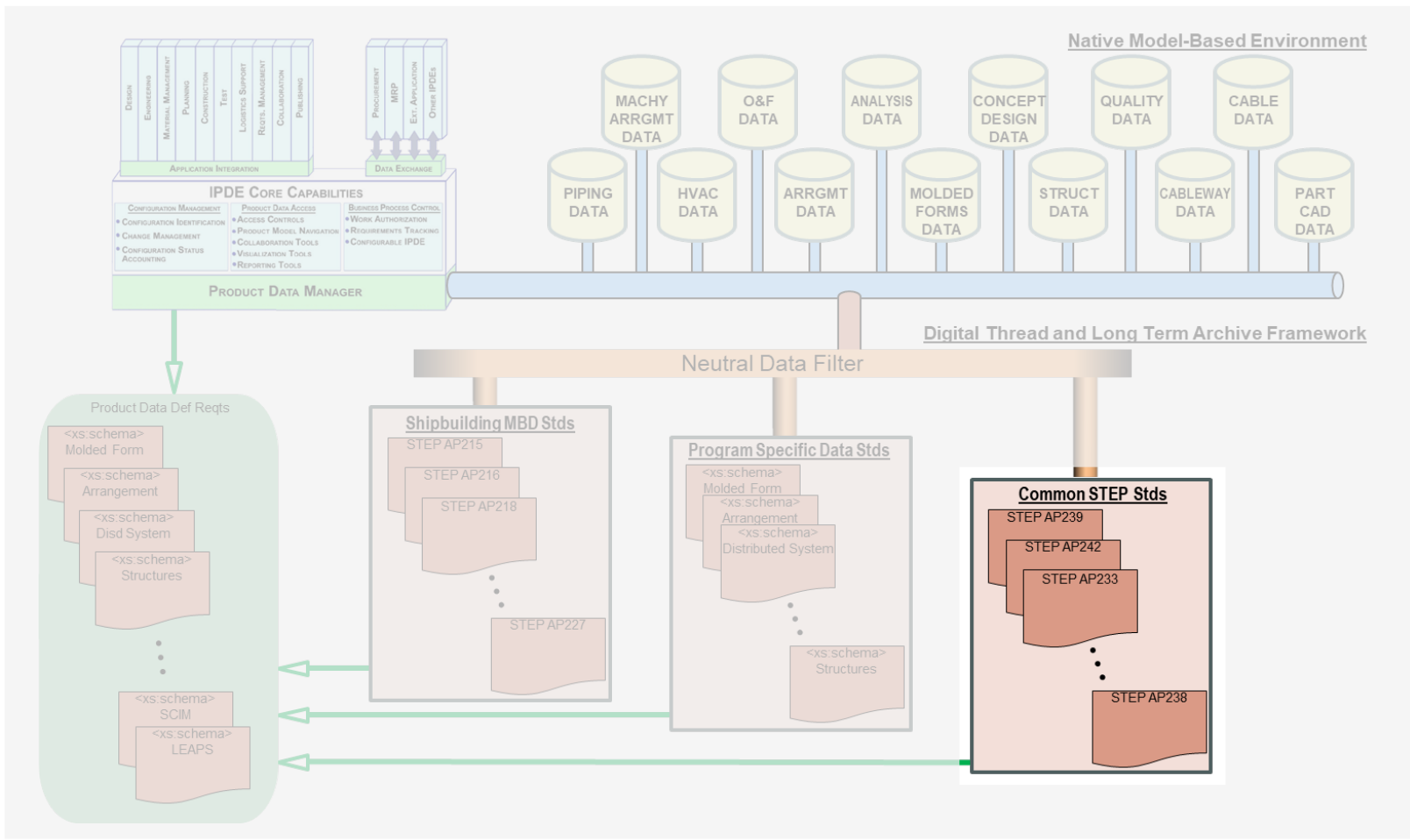
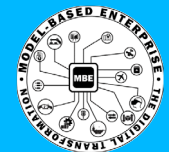
Model Based Enterprise



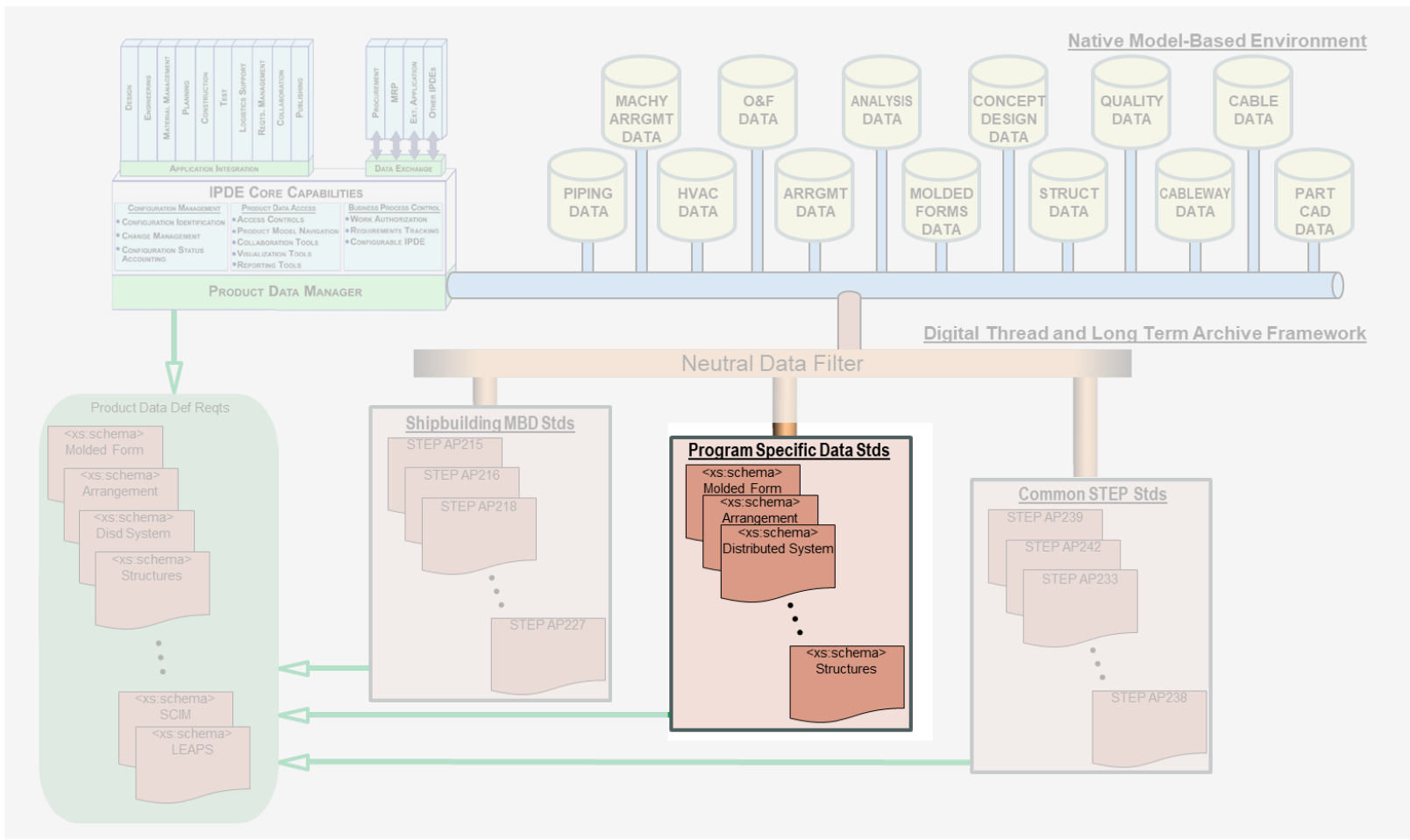
Standards Based Digital Thread and Long Term Archive Framework



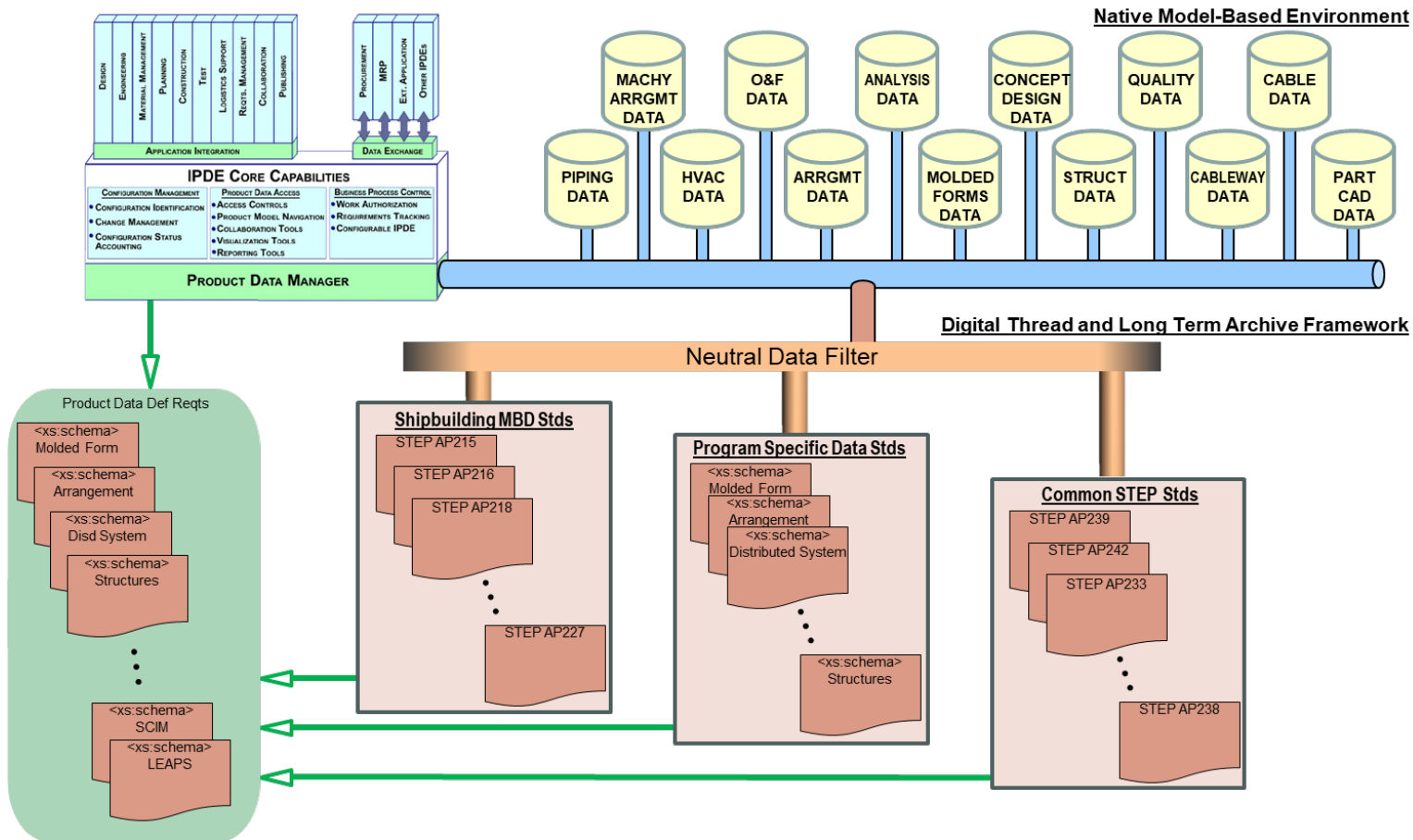
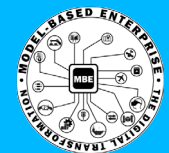
Standards Based Digital Thread and Long Term Archive Framework



Standards Based Digital Thread and Long Term Archive Framework



Standards Based Digital Thread and Long Term Archive Framework



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Welcome to my highly Integrated Digital Thread Enabled Model-Based Environment



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Silos Exist

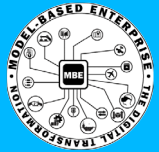
Fact of Life



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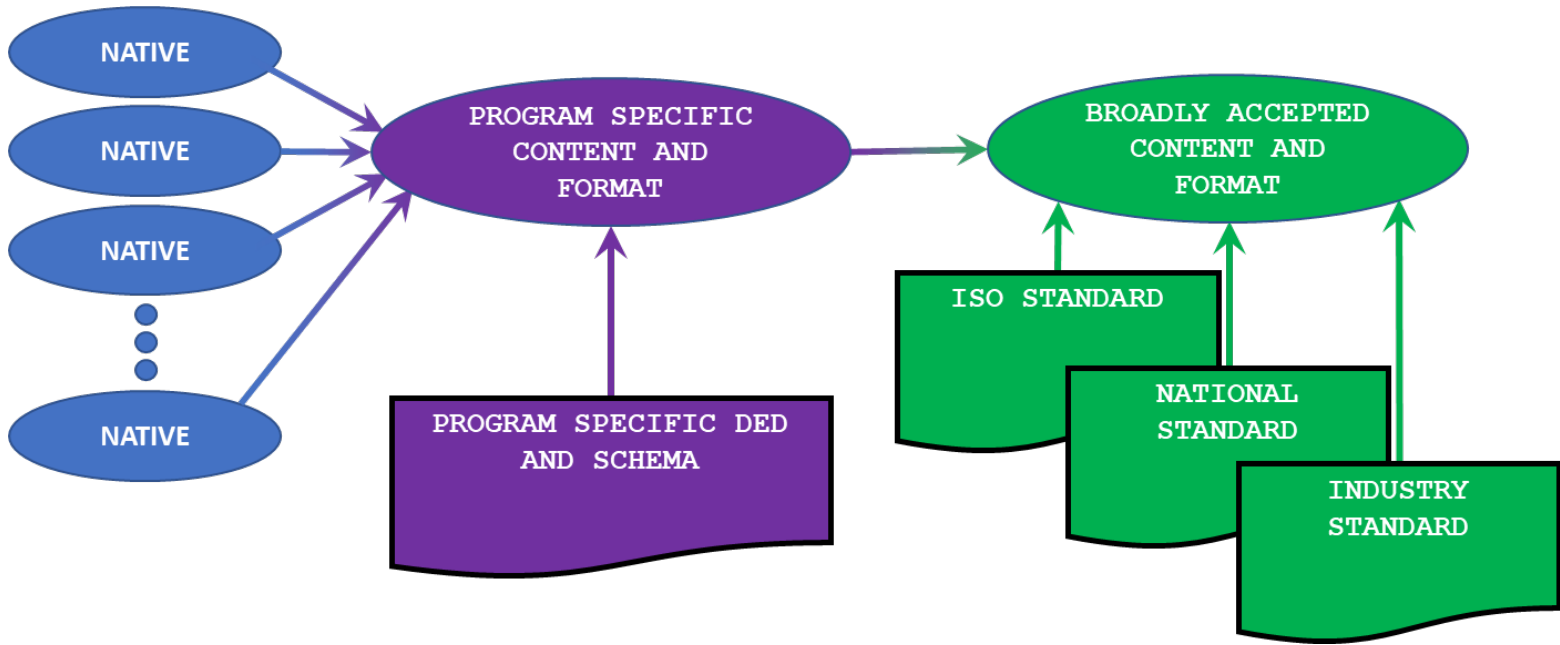
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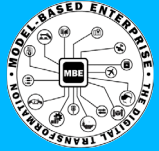




That was a mouthful

Now tell me what it means



**Part & System Definition**

- Caterpillar 3512
- Starboard Main Engine
- Propulsion System

Design Definition

- 12 cylinder
- 4 stroke
- Diesel engine

Physical

- Geometry
- Material connection

Engineering Definition

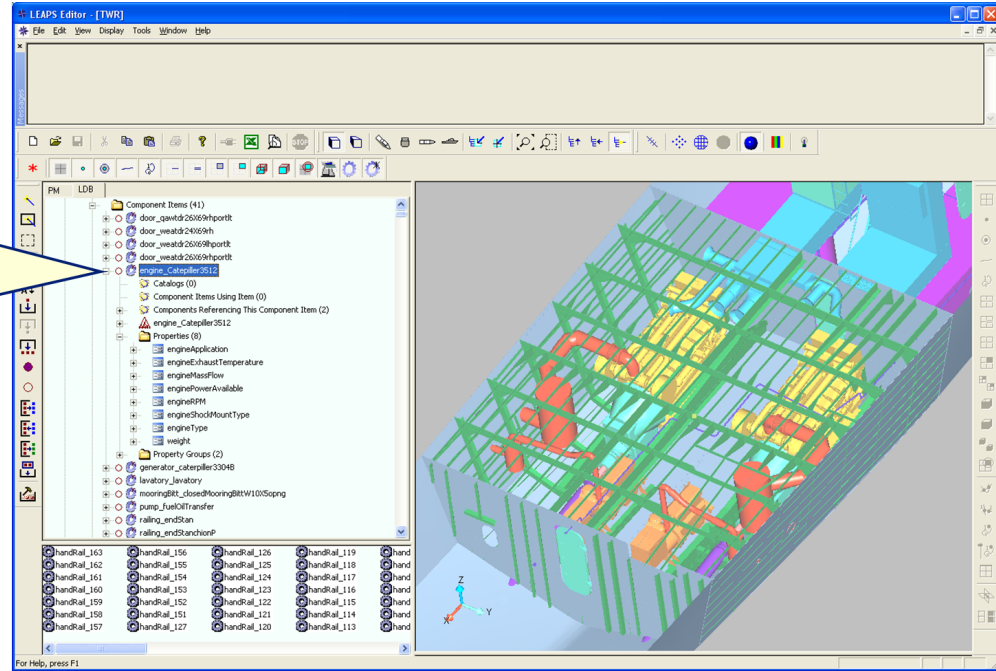
- 1175 HP
- 6464kg
- 170mm bore
- 190mm stroke

Process Definition

- Starting instructions
- shaft alignment

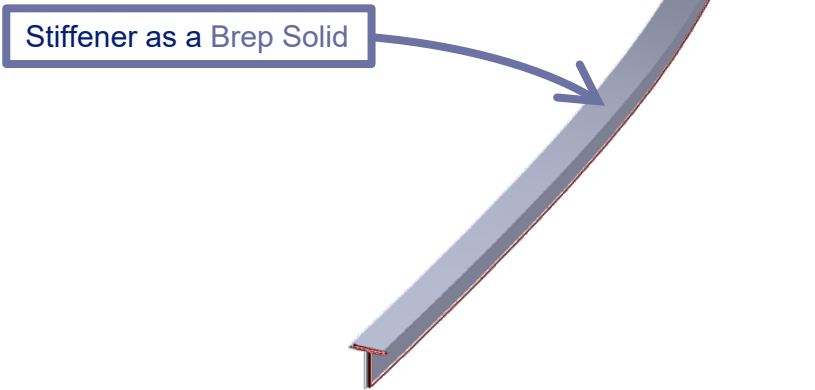
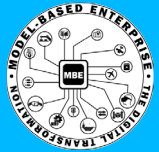
Logistics Support

- FGC
- SCLSS



But what about other stuff?

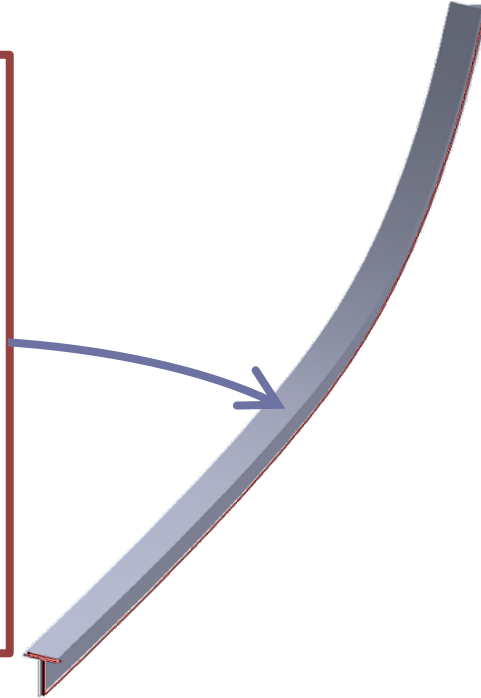






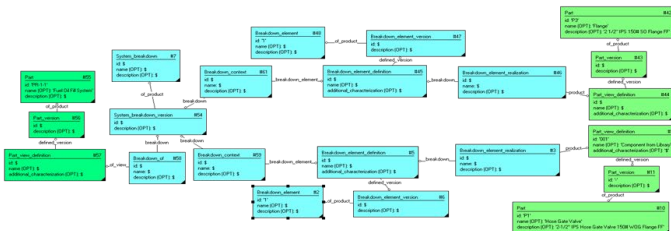
Stiffener as a parametric cross section and a trace

```
Entity name="npd:Profile_functional_definition" module="AP218"  
  Entity name="npd:W_shape_cross_section" module="AP218"  
    enumeration value="stiffener"  
    Property name="Depth"  
    Property name="Flange_thk"  
    Property name="K"  
    Property name="Radius"  
    Property name="Web_thk"  
    Property name="Width"  
  Entity name="npd:Section_properties" module="AP218"  
    Property name="Area"  
    Property name="Moi_u"  
    Property name="Moi_uv"  
    Property name="Moi_v"  
    Property name="Na_u"  
    Property name="Na_v"  
    Property name="Nominal_mass_per_len"  
    Property name="Tr"  
  Entity name="npd:Profile_curve_trace_line" module="AP218"  
    Entity_ref eref="geometry_schema:curve"  
  module="geometry_schema"
```



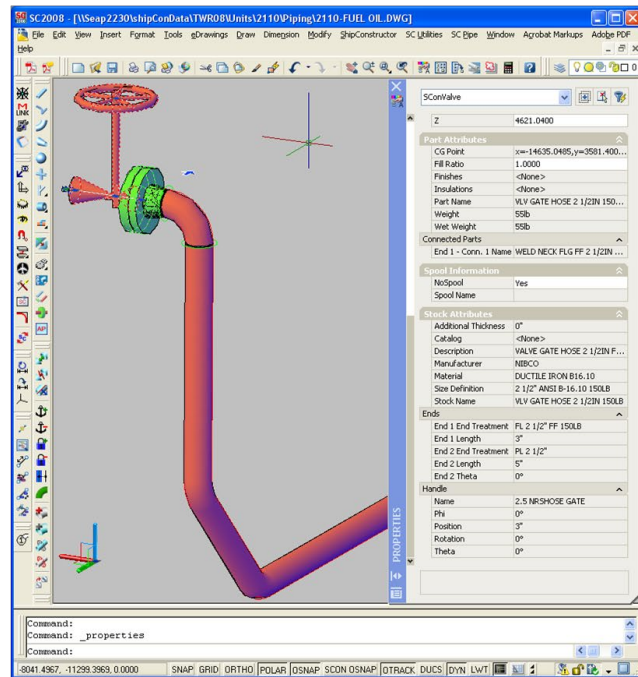
Sometimes my shape may seem a bit strange

But it is the shape I need



```

/* Fuel Oil Fill System Definition */
#58 = BREAKDOWN_OF($,$,$,#54,#57);
#54 = SYSTEM_BREAKDOWN_VERSION($,$,#7);
#7 = SYSTEM_BREAKDOWN($,$,$);
/* Hose Gate Valve as member of Fuel Oil Fill System */
#59 = BREAKDOWN_CONTEXT($,$,$,#54,#5);
#5 = BREAKDOWN_ELEMENT_DEFINITION($,$,$,$,(),#6);
#6 = BREAKDOWN_ELEMENT_VERSION($,$,#2);
#2 = BREAKDOWN_ELEMENT('1',$,$);
#3 = BREAKDOWN_ELEMENT_REALIZATION($,$,$,#5,#12);
/* Flange as member of Fuel Oil Fill System */
#61 = BREAKDOWN_CONTEXT($,$,$,#54,#45);
#45 = BREAKDOWN_ELEMENT_DEFINITION($,$,$,$,(),#47);
#47 = BREAKDOWN_ELEMENT_VERSION($,$,#48);
#48 = BREAKDOWN_ELEMENT('1',$,$);
#46 = BREAKDOWN_ELEMENT_REALIZATION($,$,$,#45,#44);
/* Connection between hose gate valve and flange */
#66 = INTERFACE_CONNECTION($,$,'bolted',#63,#64);
#65 = INTERFACE_CONNECTOR_DEFINITION($,$,$,'1/8" gasket,
4 - 3/8 - 16UNC" x 2" bolt',$,$,(),$,$);
#64 = INTERFACE_CONNECTOR_OCCURRENCE($,$,$,#65,#44);
#63 = INTERFACE_CONNECTOR_OCCURRENCE($,$,$,#65,#12);
ENDSEC;
END-ISO-10303-21;
  
```



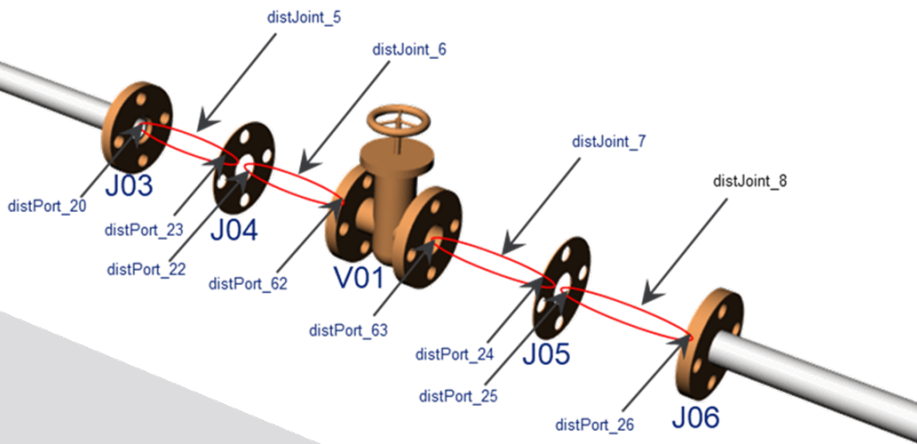
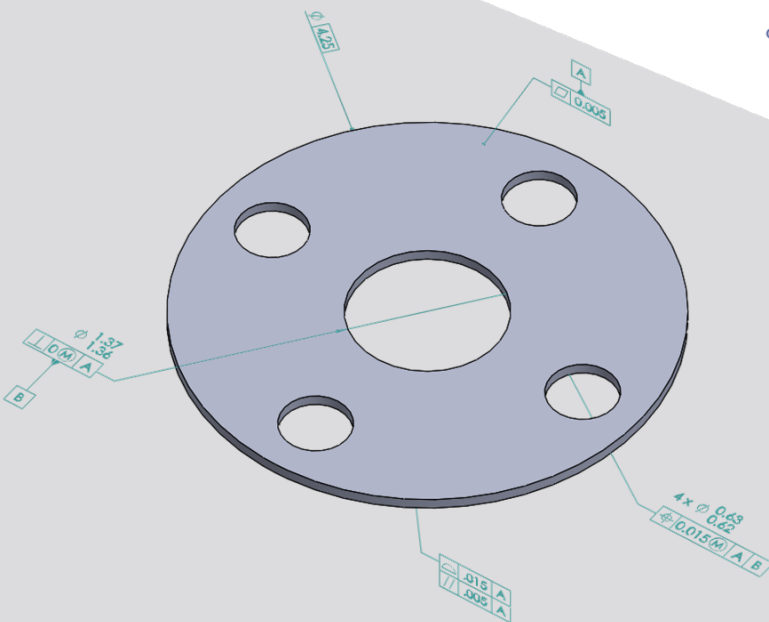
But what about other stuff?



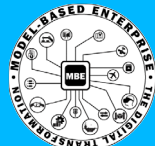
Shape Data and PMI is important

... but product data is so much more

Shape
Product Information
Manufacturing Information



Functional Definition
Systems Engineering
Simulation and Analysis
Configuration Control



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Casting



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Robotics and Assembly



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Nesting and Cutting



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Pipe Bending



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Welding



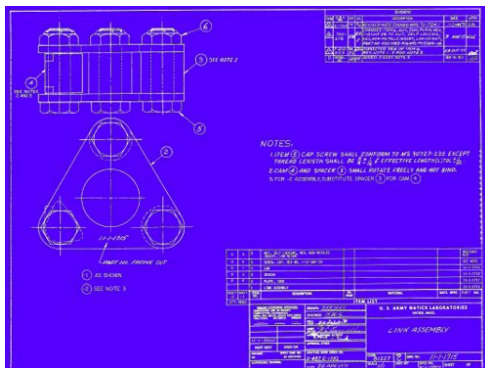
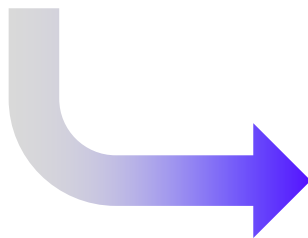
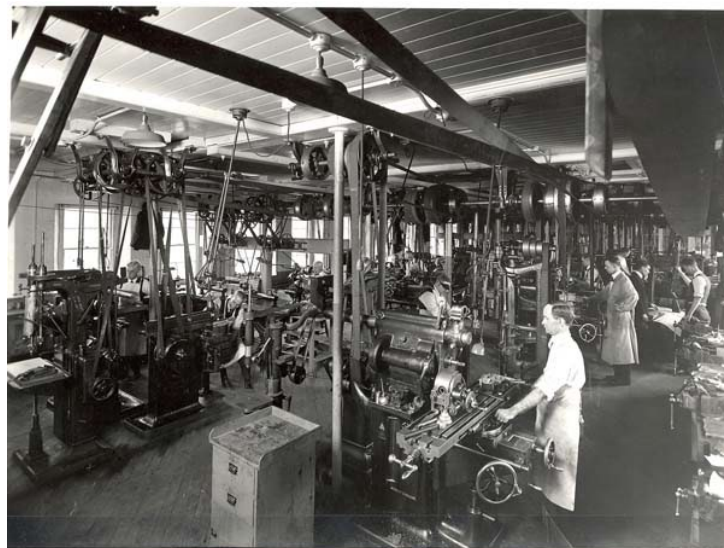
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my fave, good old fashioned material removal

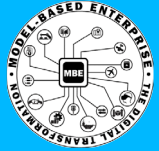


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