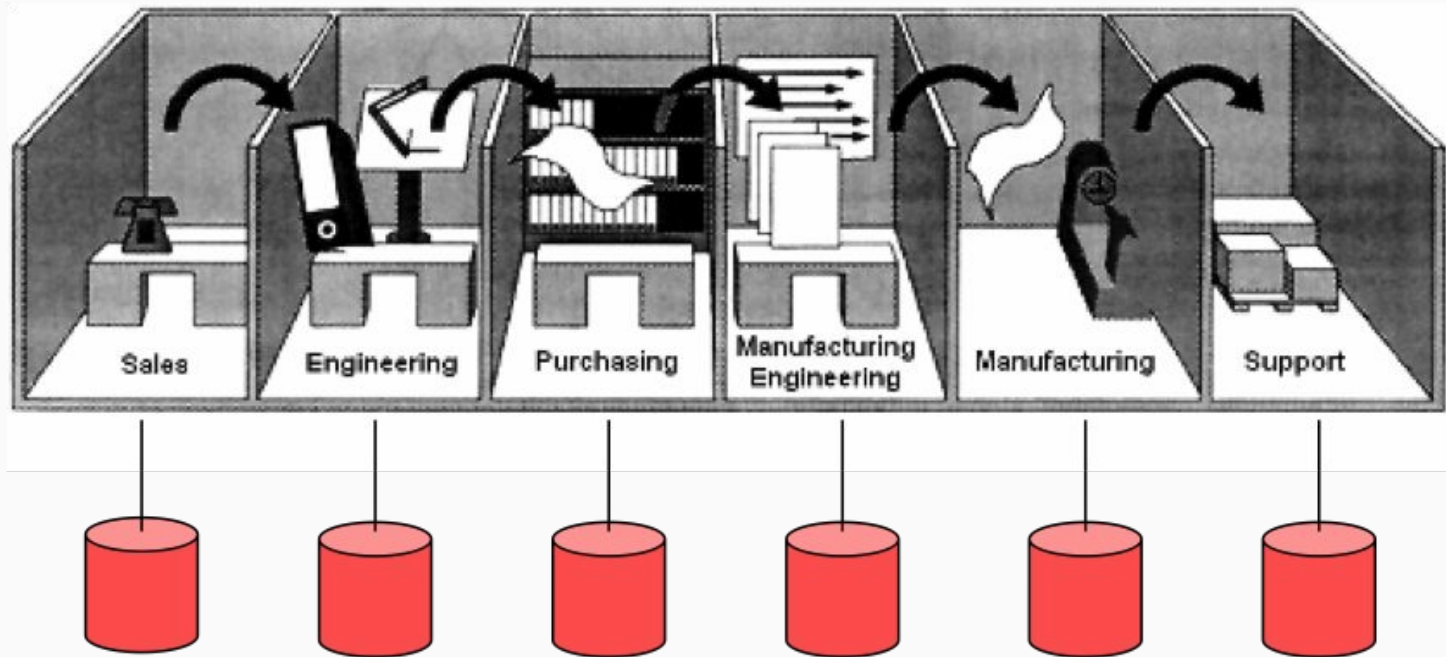




The Digital Future of PLM

Oleg Shilovitsky,
CEO OpenBOM, Blogger BeyondPLM

PLM Problem Over Years



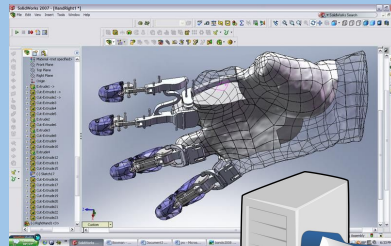
PLM Digital Evolution - Networks and Connected Apps

Paper



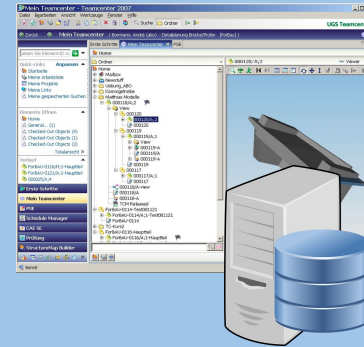
Drafting Boards

File



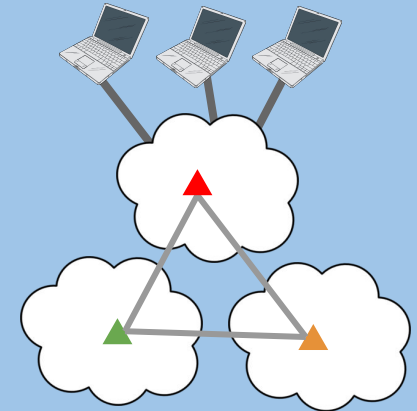
CAD Files

Data



PLM Database

Network



Connected Apps

Single Source Of Truth - Still The Best Way To Sell PLM?

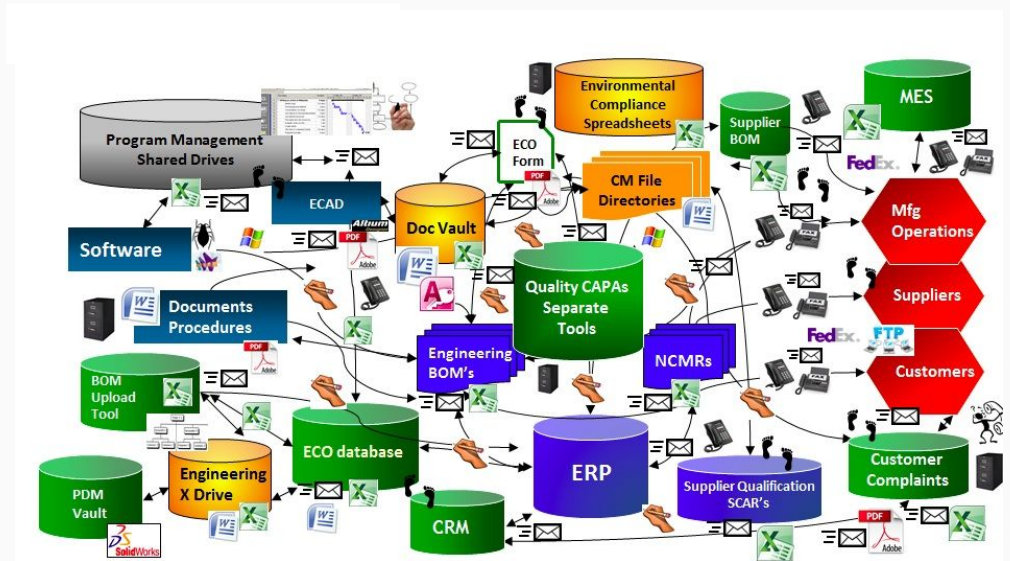
The image shows a Google search interface for 'product lifecycle management'. At the top, the search bar contains the text 'product lifecycle management'. Below the search bar, there are navigation tabs for 'All', 'News', 'Images', 'Books', 'Videos', and 'More', along with 'Settings' and 'Tools'. A row of filters includes 'software', 'process', 'supply chain', 'gartner magic quadrant', 'plm', 'agile', 'fashion', 'sap', 'icon', 'product development', 'engineering', 'marketing', 'diagram', and 'manuf'. The search results are displayed in a grid of 12 columns and 3 rows. Each result includes a thumbnail image, a title, and a URL. The thumbnails show various diagrams and charts related to PLM, such as circular diagrams, flowcharts, and matrices. The first row of results includes: 'Product Lifecycle Management' from caggenini.com, 'Ultimate Product Life Cycle M...' from smartsheet.com, 'PLM Software / Product Lifecycle ...' from plm.automation.siemens.com, 'What is Product lifecycle management (PLM)' from batchmaster.co.in, 'Product Lifecycle Management ...' from persistent.com, 'What is PLM?' from global-value-web.com, 'Product Lifecycle Management...' from amm-group.com, and 'ZIRA Product Lifecycle Management...' from zira.com.ba. The second row includes: 'Product Lifecycle Management...' from reuters.com, 'Product lifecycle - Wikipedia' from en.wikipedia.org, 'Product Lifecycle Management (...)' from plex.com, 'Product Lifecycle Management (PLM ...)' from configit.com, 'Product Lifecycle Management (PLM ...)' from sopheon.com, 'Product Lifecycle Management ...' from marketingtutor.net, 'Product Lifecycle Management' from infosoftwaresolutions.com, and 'Product Lifecycle Management ...' from engineering.com. The third row includes: 'Product Lifecycle Management (PL...)' from sooojunction.com, 'Product Lifecycle Management (PL...)' from ipcsautomation.com, 'Product Life-Cycle Management (PLM ...)' from stracongroup.com, 'Product Lifecycle Management ...' from thriveglobal.com, 'Product Lifecycle Management Software ...' from infolutch.com, 'Product Lifecycle Management (PL...)' from amessen.com, 'Product Lifecycle Management ...' from infosys.com, and 'PLM Services - Accenture' from accenture.com. At the bottom left, there is a 'Related searches' section with a list of terms: 'sap plm', 'what is enterprise resource planning erp', and 'product costing'. The bottom right of the search results shows a 'Related searches' section with a list of terms: 'Lifecycle Management - Devis...', 'Product Lifecycle Management', 'Product Lifecycle Management Solutions', 'Product Lifecycle Managem...', 'SAP PLM, Full form and Meaning', 'Product Lifecycle Managem...', and 'Product Lifecycle Management | English'.

Vision vs Reality

The ideal picture of PLM

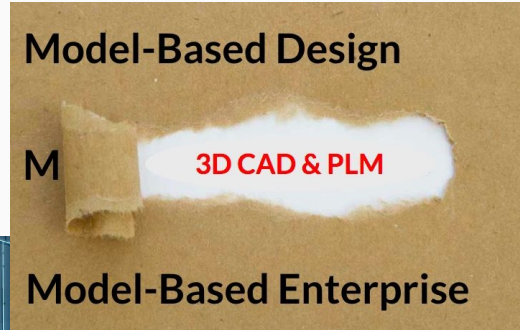


A typical company picture of PLM



Has The Term PLM Run Its Course?

Business process + Technology + Products



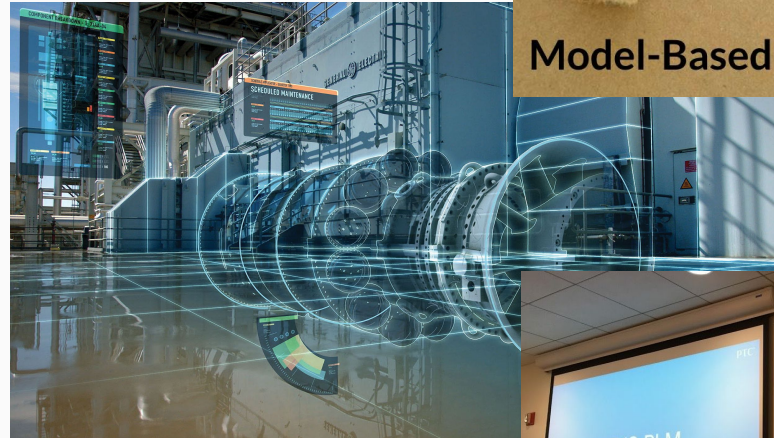
Concluding Remarks

The State of the PLM Industry: The Digital Revolution

- The global PLM ecosystem is alive and well, but we are still spending a lot of time on the basics
- Industry 4.0, IoT, Digital Twins & Threads, model-based whatever, Blockchain, digitalization, and other emerging topics are, in many ways, making us rethink what is PLM and how it needs to be enabled
- Everyone is talking about Digital Transformation, but the definitions aren't always the same
 - Perhaps, just a new name to what we have been trying to do for years?
 - It is time to stop trying to sell "PLM"?

The future is bright, but will your company be part of it.

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PLM's Future

From 2019 CIMdata PLM Status & Trends survey (2 of 2)

Has the term PLM run its course?

Response	Percentage
No	48%
Yes	52%

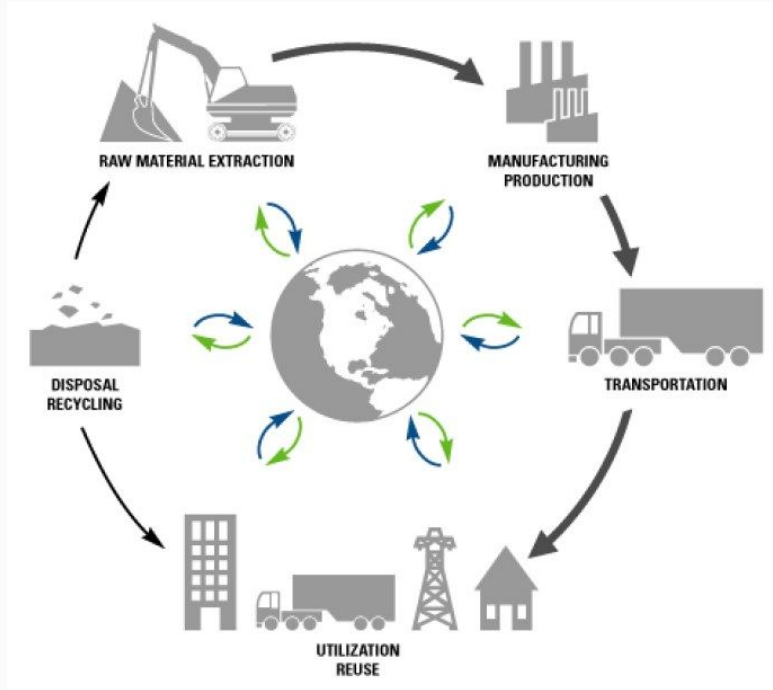
CIMdata comment: PLM may have worn out its welcome.

n=102

CIMdata Copyright © 2019 by CIMdata, Inc. 32

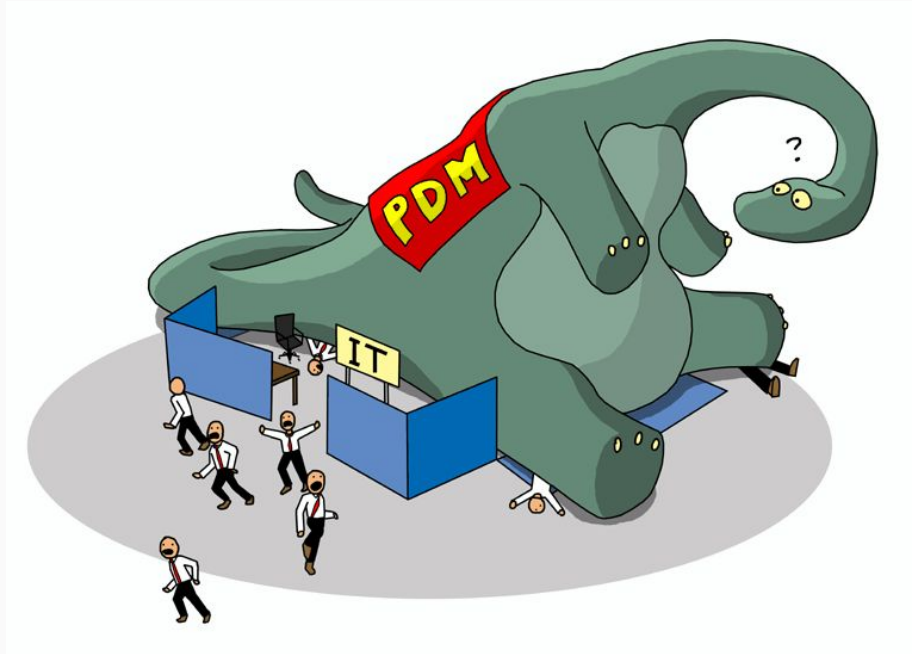


PLM Vision vs Reality of CAD Data Management



Source Wikipedia: https://en.wikipedia.org/wiki/Product_lifecycle

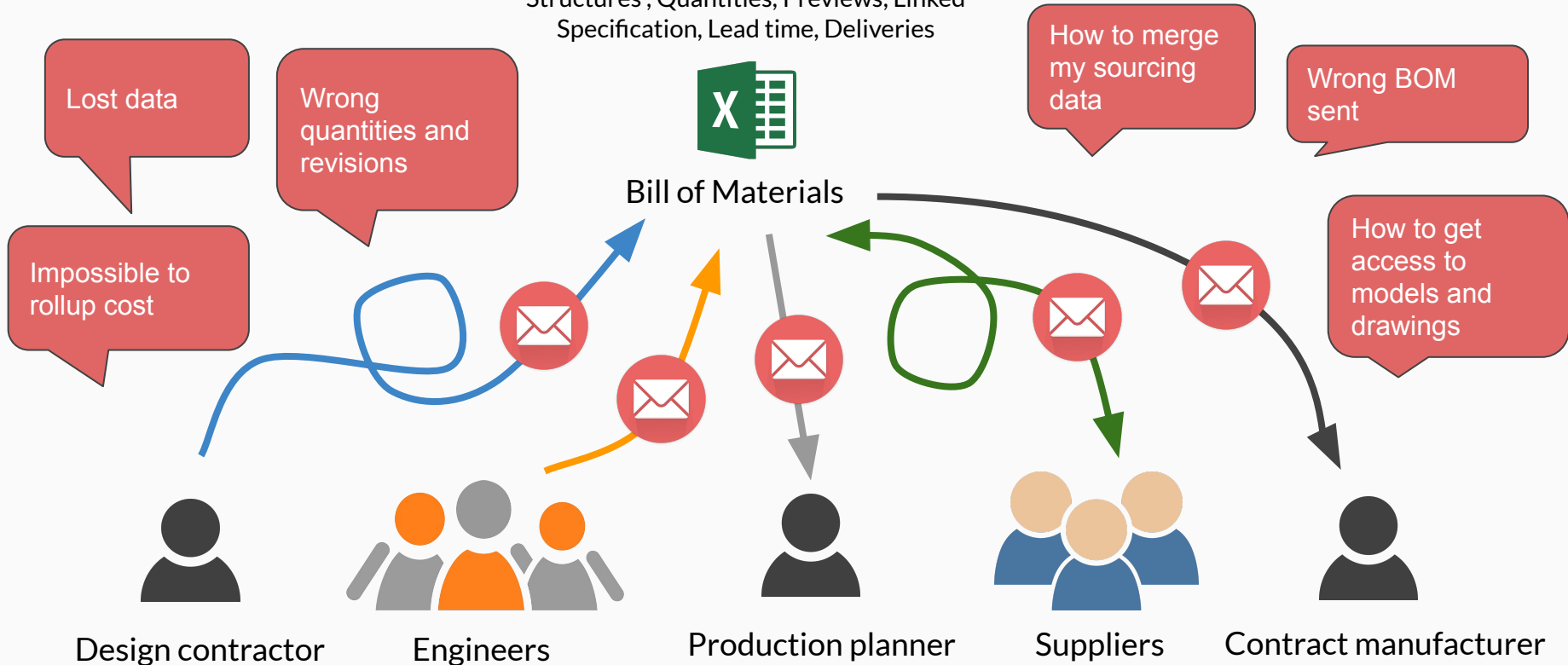
VS.



Source: Solidworks blog
(<https://blogs.solidworks.com/solidworksblog/2017/08/feeding-dinosaur-pdmpim-landscape.html>)

PLM Excels Are Representing Ages Of Pain

List of parts, Where used, Indented Structures, Quantities, Previews, Linked Specification, Lead time, Deliveries



The Reality of Many Manufacturing Organizations

Inventory and Purchase Order



BOM, Parts, Vendors

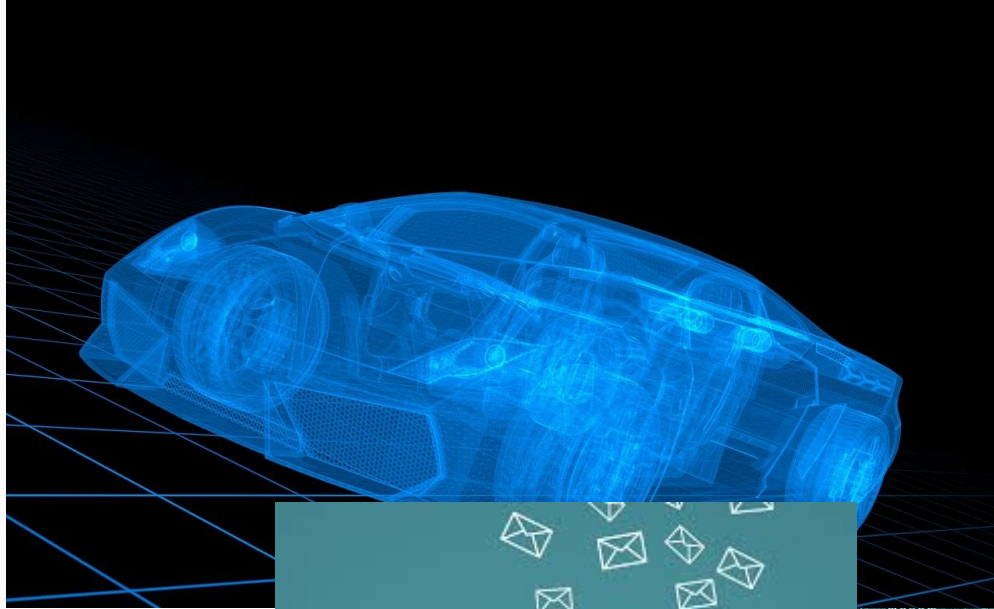


Item Number	Description	Quantity	Revision	Reference Designation	Effective Date	Category Name	Lifecycle Phase	Level	Preferred Cost	Distributor Name	Distrib
006804-01	Abstat Sensors, 10 Pair Dispenser	1	01	2	6/1/2016	S&L - Top Level Assembly Development	Testing	1	520.10	5200.10	
006806-01	Dispenser, 10 Pair Sensor Pack	1	01	2		Part Fabricated	Testing	1	0	50.00	
006808-01	Cutter Sleeve, 10 Pack Sensor	1	01	3		Part Fabricated	Testing	1	0	50.00	
006810-01	Network, Sensor Carton Clear Sleeve	8	01	1		Part Fabricated	Concept	1	NA	NA	
006812-01	Alarm, Sensor 2 Pack	10	01	1		Part Fabricated	Testing	1	520.82	5200.10	
006814-01	Cable, Combined 3 Stern Audio	1	01	3		Part Fabricated	Concept	2	5.52	53.82	
006816-01	Label, Sensor 2 Pack Product	1	01	4	6/1/2016	Part Fabricated	Testing	2	0	50.00	
006818-01	Network, 2 Pack Product Label	0	Dead	REF		Network	Concept	2	NA	NA	
006820-01	Cutter Box, Sensor 2 Pack	1	01	3		Part Fabricated	Testing	2	8.01	59.02	
006822-01	Network, Sensor 2 Pack Cutter Box	0	Dead	REF		Network	Concept	2	NA	NA	
006824-01	Cable Inserter, Sensor 2 Pack	1	01	2		Part Fabricated	Testing	2	RU	RU	
006810-01	Network, 2 Pack Product Label	0	Dead	REF		Network	Concept	2	NA	NA	
006812-01	Abstat Sensor	2	02	1		Part Fabricated	Testing	2	58.14	148.28	
006814-01	Abstat Sensor	1	04	1	1/29/2016	Part Fabricated	Testing	1	58.14	58.14	
006816-01	Labeling, Abstat Sensor	1	01	3	1/27/2016	Part Fabricated	Testing	4	0.41	50.45	
006818-01	Network, Sensor Housing Logo	0	01	REF		Network	Concept	4	0.16	50.16	
006820-01	Label, Individual Sensor Product	1	01	4	6/1/2016	Part Fabricated	Concept	4	NA	NA	
006822-01	Network, Sensor Product Label	0	01	REF		Network	Testing	4	NA	NA	
006824-01	Screen, Abstat Sensor Label	1	02	2	5/28/2015	Part Fabricated	Testing	4	0	50.00	
006826-01	PCBA, Abstat Sensor	1	02	1	5/27/2015	Part Fabricated	Testing	4	5.58	25.58	NA
006828-01	Abstat Sensor	1	02	1	5/27/2015	Part Fabricated	Testing	4	5.58	25.58	NA
006830-01	Microphonic, Abstat Sensor	2	01	M1	5/27/2015	Part COPIES	Active	3	0.4426	RU	Digkey
006832-01	Filtering, Abstat, Abstat Sensor	1	01	02	5/27/2015	Part Fabricated	Testing	3	0.18	RU	RU
006834-01	Jack, 3 Stern Audio	1	01	M1	5/27/2015	Part COPIES	Active	3	0.9719	RU	Digkey
006818-01	Label, Individual Sensor Product	1	01	2	5/27/2015	Part Fabricated	Testing	3	1.95	51.95	
006820-01	Network, Sensor Addressive Pad	0	01	REF		Network	Testing	4	NA	NA	
006822-01	Label, 10 Pair Sensor Product Information	1	01	4	6/1/2016	Part Fabricated	Testing	1	0	50.00	
006814-01	Network, 10 Pair Sensor Product Info Label	0	01	REF		Network	Concept	1	0	50.00	

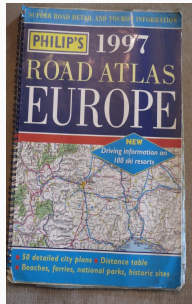
Digital Transformation

Data Management

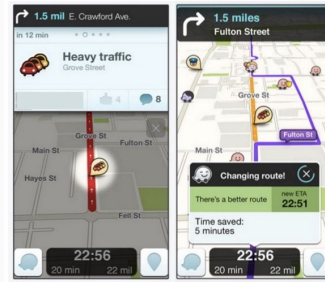
Digital.... What?



Digital Transformation of Driving - 30 years

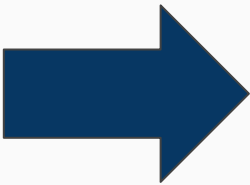
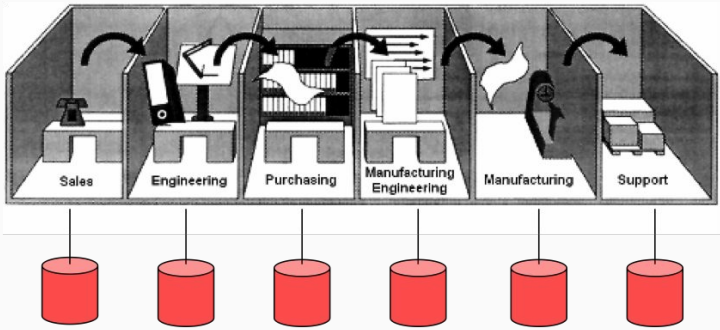


Siloed information - maps, locations, shops, traffic, changes, hotels, restaurants, gas stations...



Organized network of data about roads, traffic, weather, hotels, cars, places of interest, people and many others...

What is Digital PLM?



Digital PLM - Work Is Not Done In A Single Place Anymore

Network coordination and manufacturing efficiency



Ford Rouge Factory



Ford Model T (1918)
41 hours (from raw materials into a completed car)
Network: assembly conveyor system



23 assembly plants in 5 countries



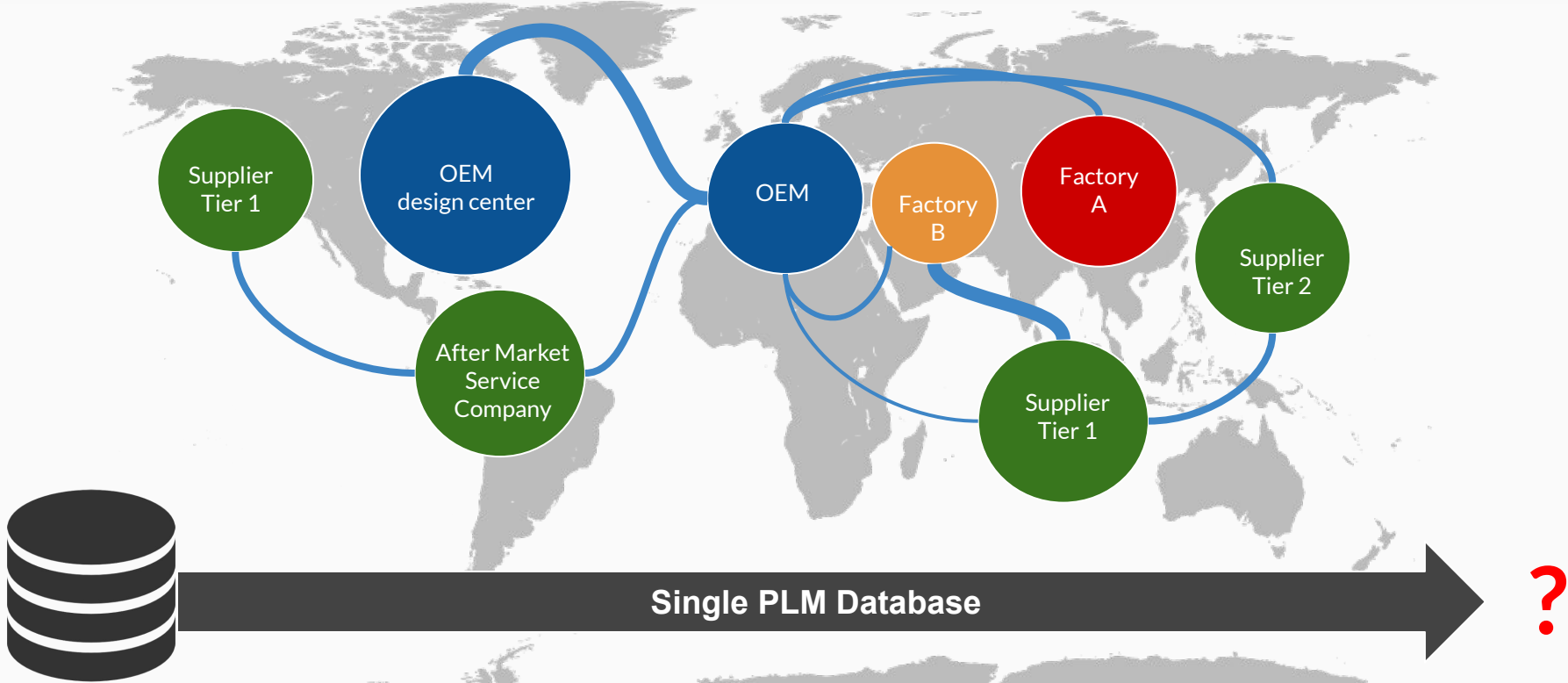
Suppliers wanted: If you are a supplier and have questions or want your information considered for our cutaway features, contact James Clark at automotiveneers@supplierbusiness.com or through www.supplierbusiness.com



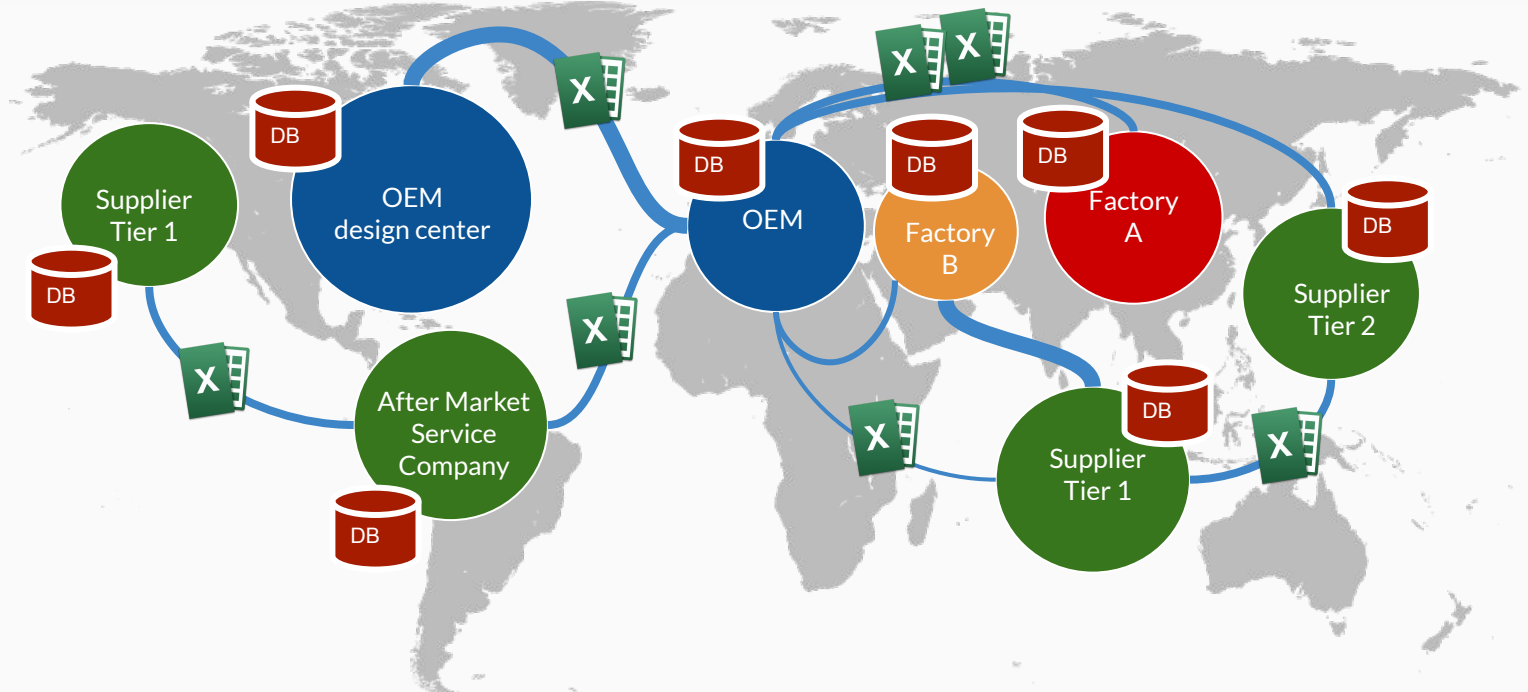
SupplierBusiness

BMW 3 Series (2018)
~20 hours final assembly
Network: 100+ major suppliers located globally

A Single PLM Database Vision - How Real Is That?

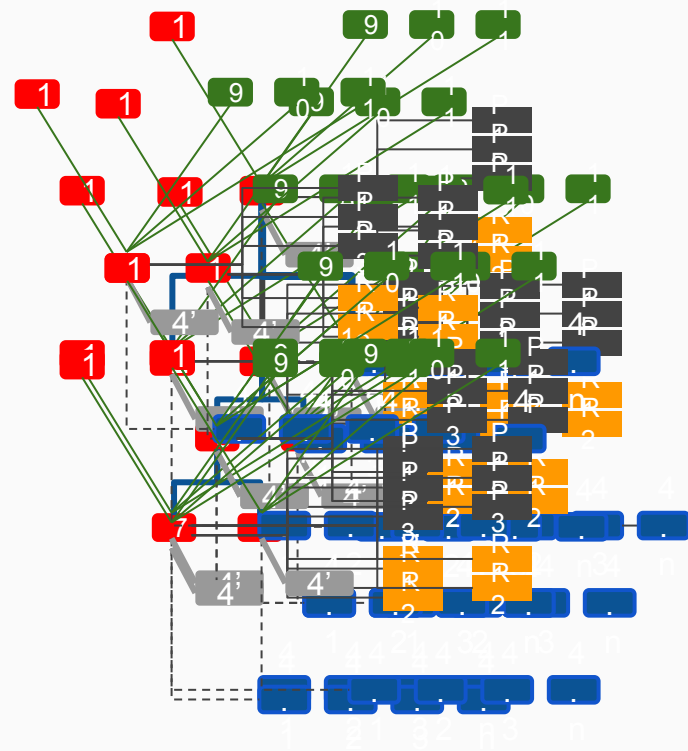
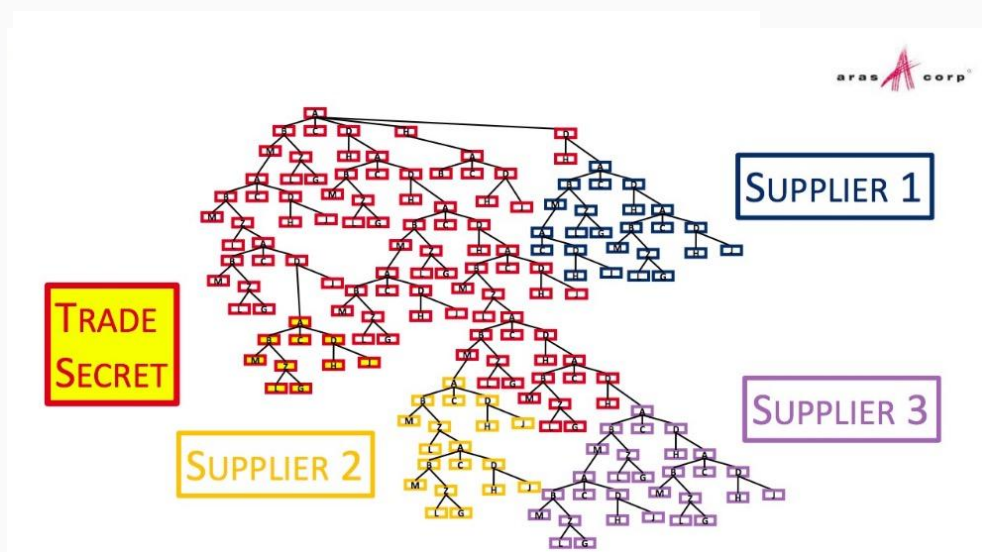


The Reality Of A Single PLM Database



Multi-disciplinary data, complex network and orchestration

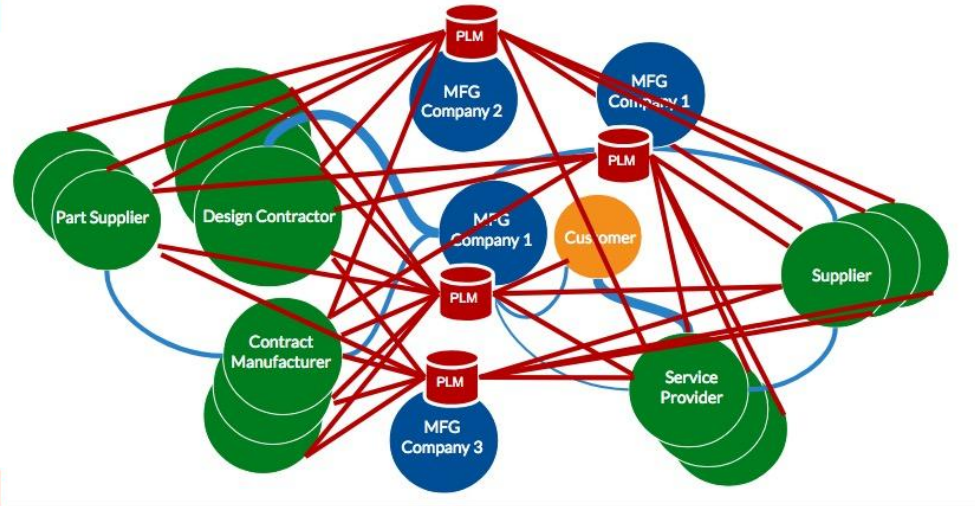
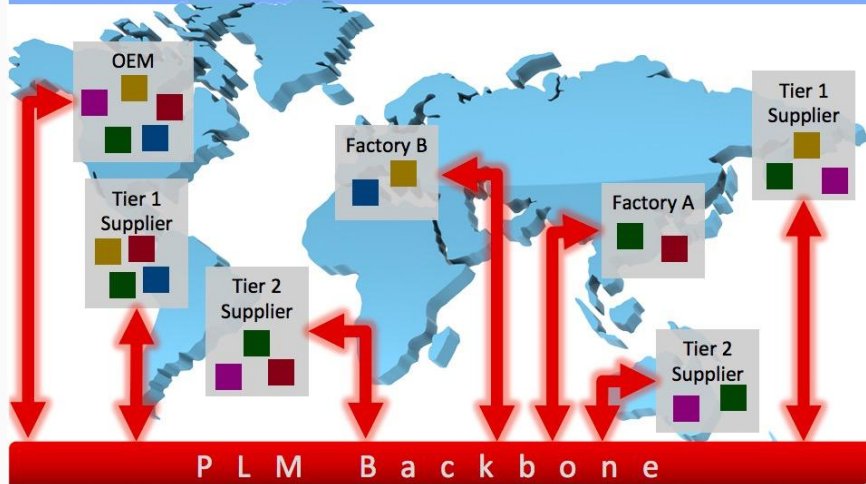
Structure Over Time In Multiple Databases



Visible Simplicity Vs. Database Complexity

The Backbone Approach to PLM

Global Product Data Interoperability Summit | 2014



ELYSIUM Parker HONEYWELL BOEING GLOBAL PRODUCT DATA INTEROPERABILITY SUMMIT 2014 BOEING is a trademark of Boeing Management Company Copyright © 2014 Nürthing, Drummel, Corporation. All rights reserved. GPOB_2014.pdf | 18

Customers Perspective



It is complex



It is expensive

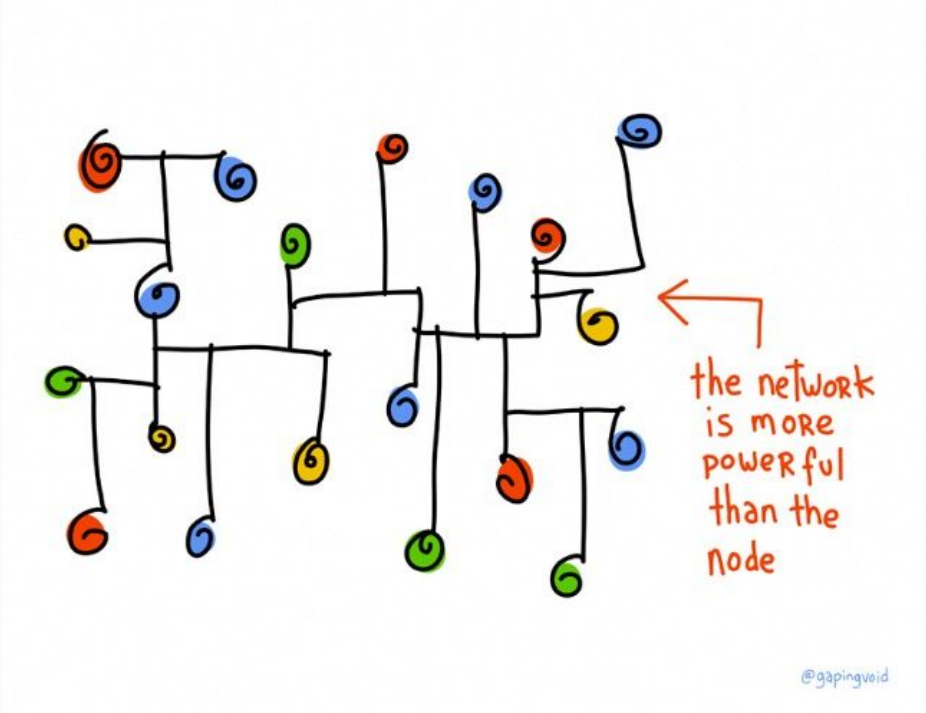


Upgrade takes tons of
time and resources

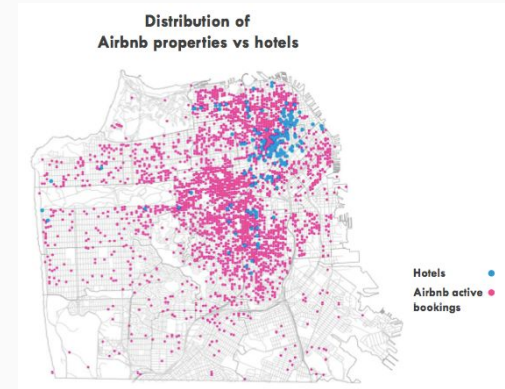
We Need To Build Networks



VS



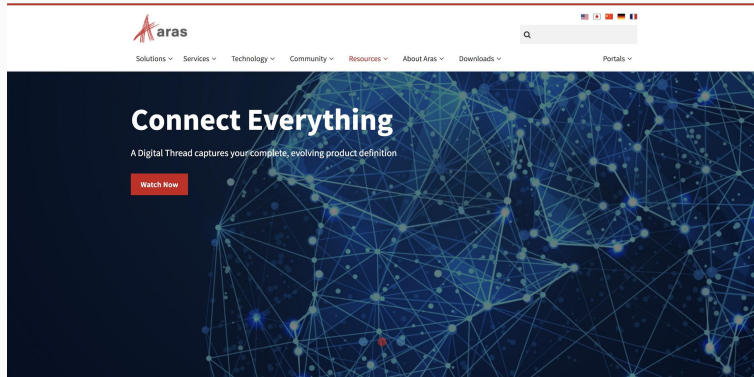
The Era Of Networks Is Coming



What common between these companies?

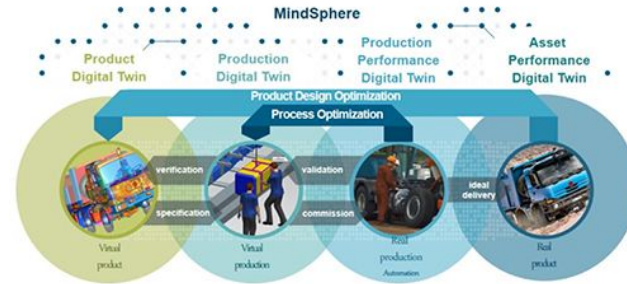
They are **NETWORK** based

PLM Vendors Are Already Adopting Network Marketing...



Digitalization's value fully realized
Digital threads connect the twins

SIEMENS
Ingenium for life.



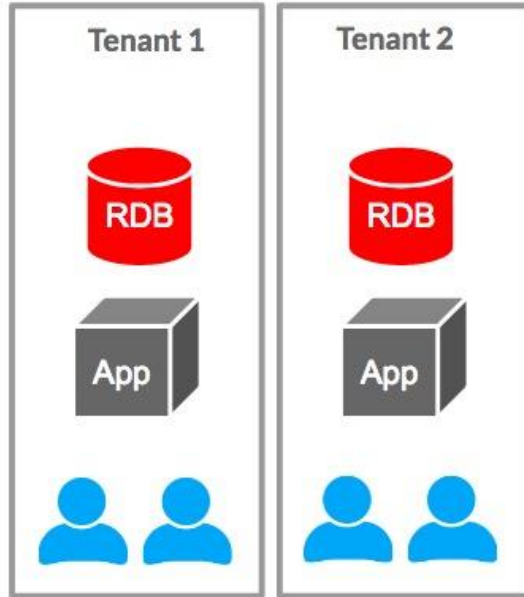
A Digital Thread to Follow Through the Manufacturing Process

#3DEXPERIENCE

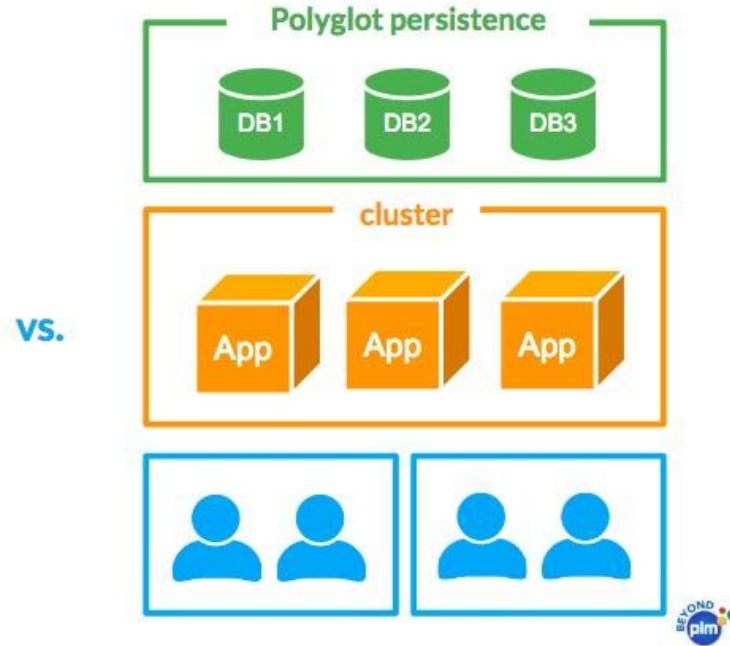
3 DASSAULT
SYSTEMES

Technology: Multi-Tenant Models

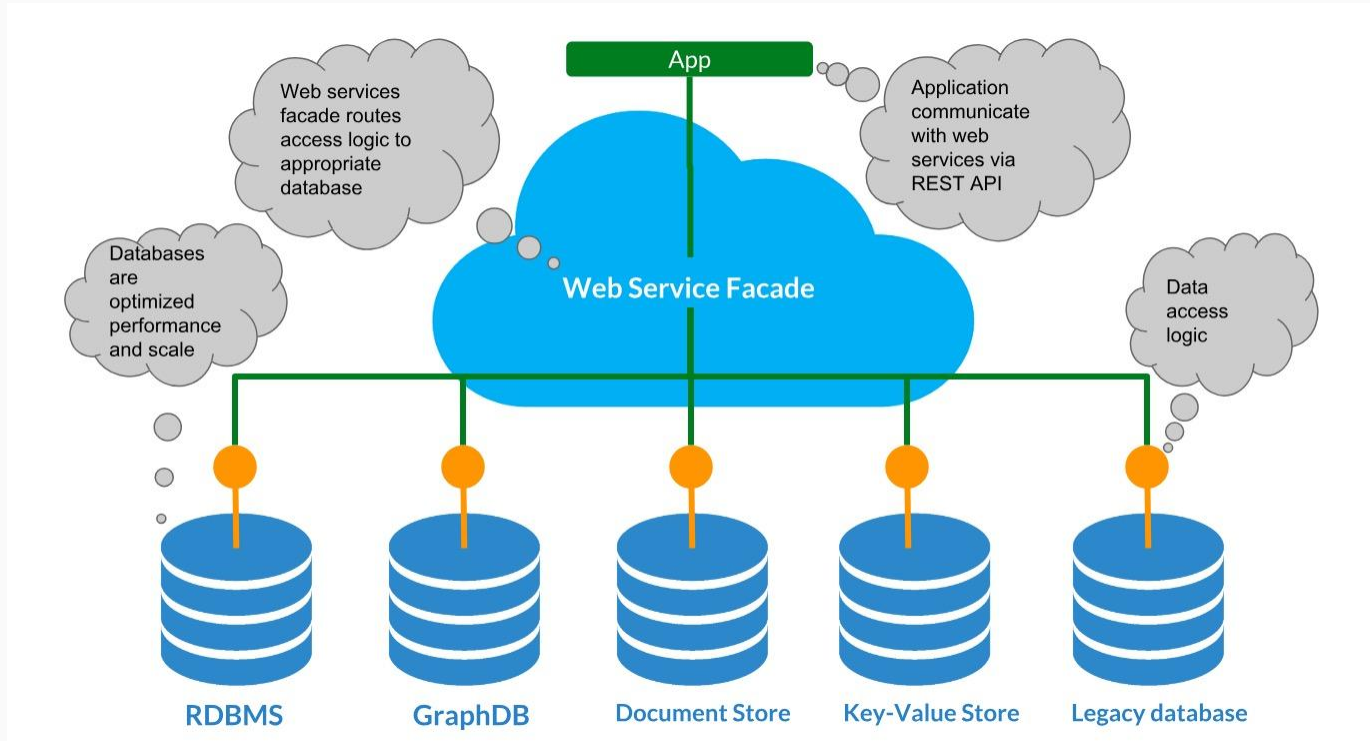
Single Tenant Model



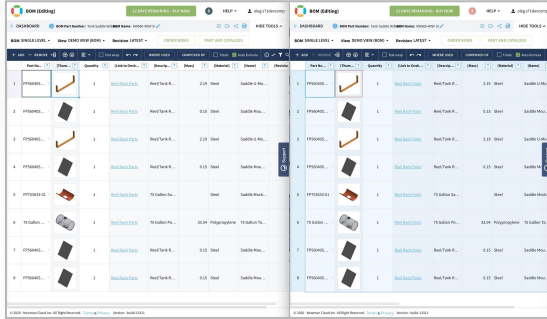
Multi-Tenant Model



Technology: Data Management And Polyglot Persistence



Technology: Real-Time Collaboration Apps



Part No.	Part	Quantity	Location	Material	Weight	Volume	Unit
1	PP100001	1	Steel	Steel	2.10	0.00	kg
2	PP100002	1	Steel	Steel	0.10	0.00	kg
3	PP100003	1	Steel	Steel	2.10	0.00	kg
4	PP100004	1	Steel	Steel	0.10	0.00	kg
5	PP100005	1	Steel	Steel	0.10	0.00	kg
6	PP100006	1	Steel	Steel	0.10	0.00	kg
7	PP100007	1	Steel	Steel	0.10	0.00	kg
8	PP100008	1	Steel	Steel	0.10	0.00	kg



Clear Communication

Less Confusion

Saves Time

Increase Productivity

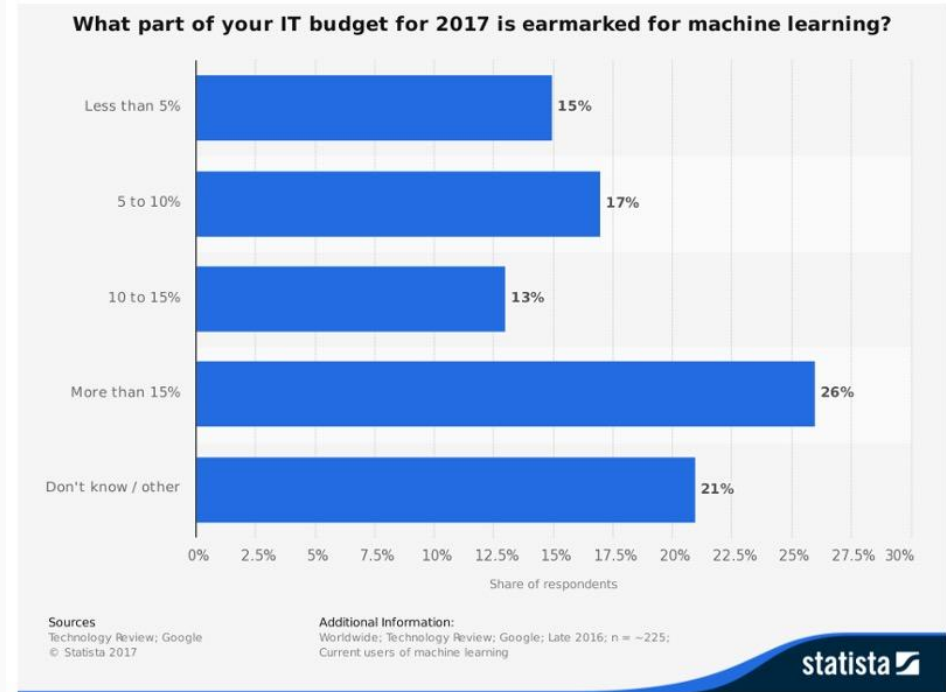
Saves Money

It's fun

Technology: Machine Learning

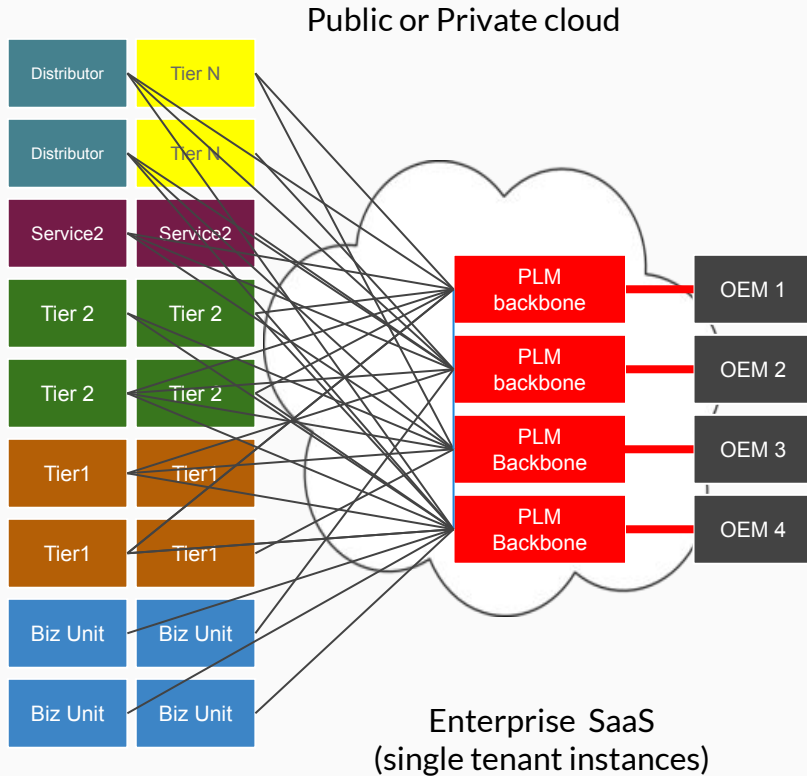


- Optimize routes and options
- Detect anomalies
- Identify objects
- Segment data

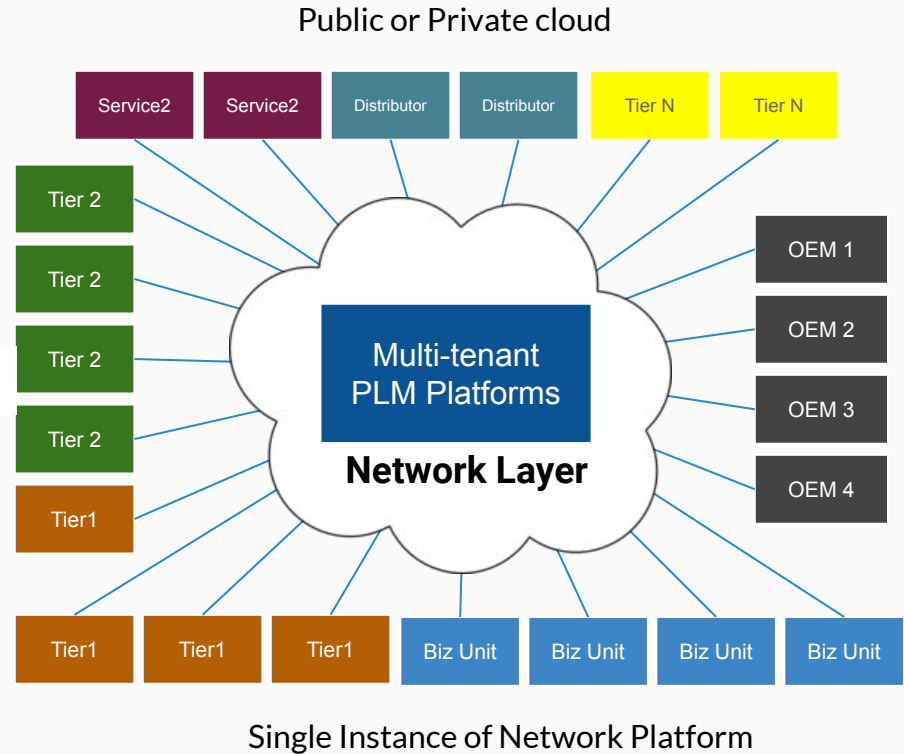


<https://www.redpixie.com/blog/examples-of-machine-learning>

Multi-Tenant Platforms Add A Network Architecture Layer

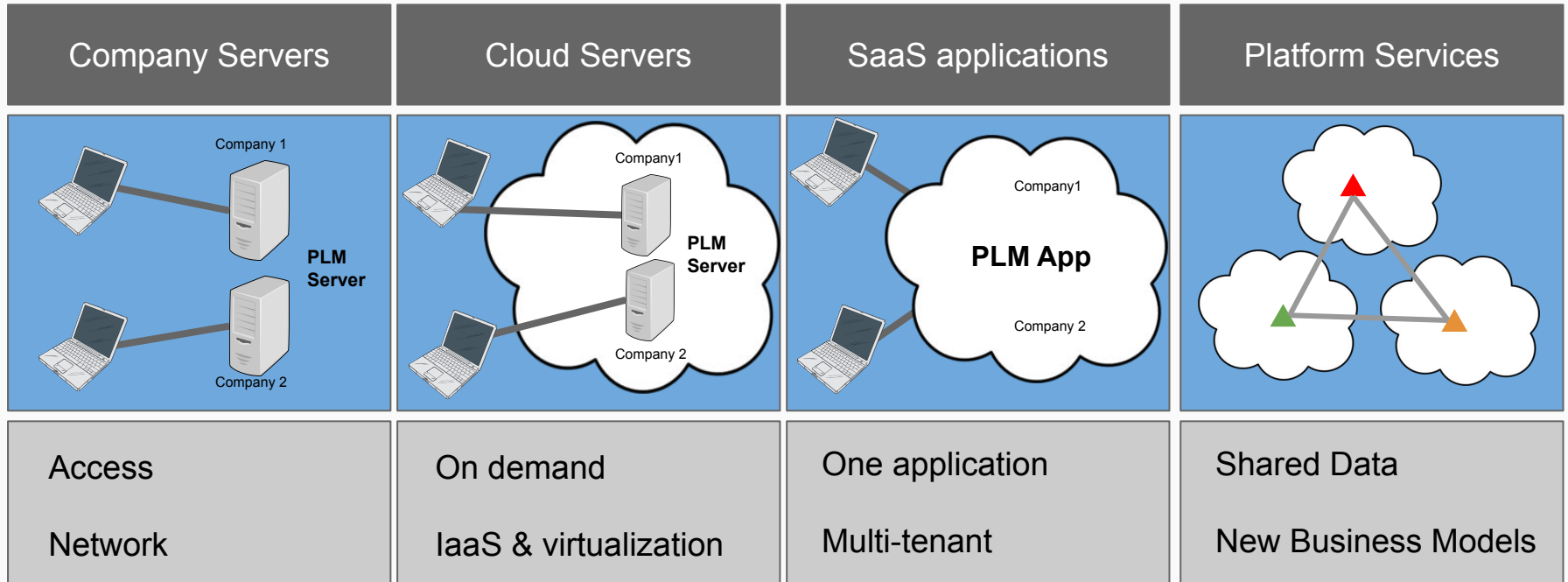


VS



PLM IT Evolution

We are here....



1990s

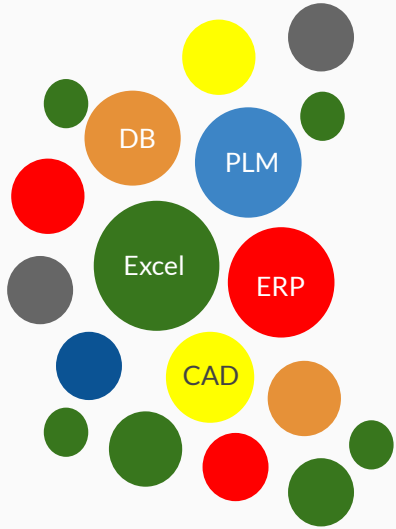
2000s

2010s

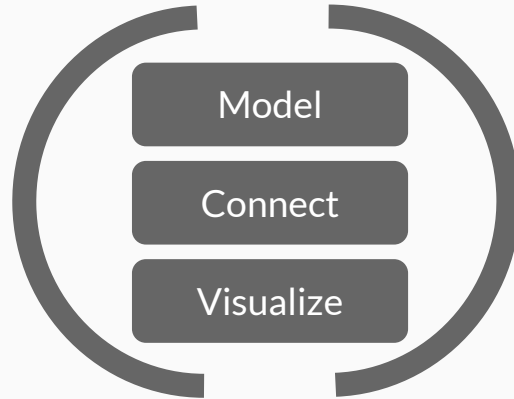
2020s

....

Digital PLM Value Chain Transformation



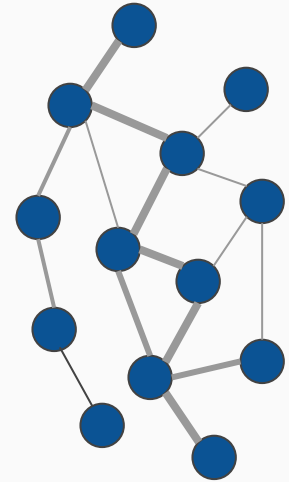
Analog Data



Digital Technologies



Digital assets



Share & Collaborate

THANK YOU!

Got A Question? Talk to me online and offline.



oleg@openbom.com



@olegshilovitsky



@beyondplm



@openbom

