



- Engineer, turned CAD admin, turned PTC Windchill admin
- Currently manage a fantastic team responsible for Engineering Systems at Weatherford
- Helped deploy PTC Windchill globally for past thirteen years
- Chair the PTC Windchill Infrastructure Technical Committee
- Regular world event attendee since 2002
- Regular presenter



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“Only in our dreams are we free. The rest of the time we need wages.”

*-Sir Terry Pratchett (Author)*



## Weatherford

- Weatherford supports the sustainable development and production of oil and gas resources, wherever they exist, to ensure the world's current and future energy needs can be met safely, efficiently and economically.
- Headquartered in Switzerland, Weatherford operate in more than 100 countries across the globe and employ more than 49,000 people.
- A public company  
(NYSE/Euronext Paris/SIX:**WFT**)  
Revenues of \$14.9 Billion in 2014.



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## Weatherford Locations

### ♥ Corporate Locations



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“If it wasn't for the fun and money, I really don't know why I'd bother.”

-Sir Terry Pratchett (Author)

## Weatherford's Primary Business is Services

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Weatherford is Weatherford's biggest customer/supplier

- Internal Sales (sales/transfers within the business) account for over 80% of Weatherford's Manufacturing Production
- A manufacturing plant makes a part/assembly
- It is sold internally to a service location
- The inventory becomes a serialised asset
- Customers are charged for the use of the equipment as part of a service contract



Fully implemented globally!

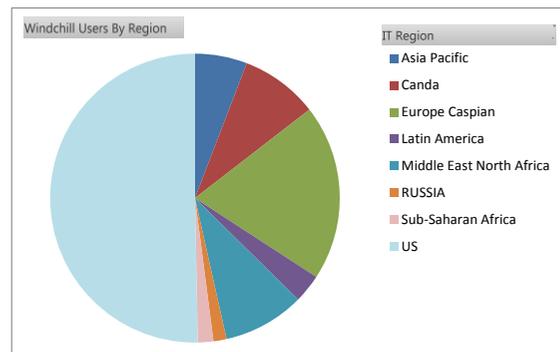
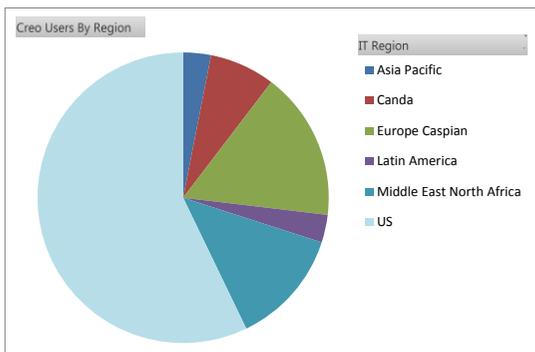
- PTC Windchill WTParts with configuration management (BOMs)
- Document Management with relationships to PTC Windchill WTParts
- CAD Data Management, PTC Creo and Inventor with links/associations to PTC Windchill WTParts
- Classification (PTC Windchill PartsLink), all PTC Windchill WTParts are classified. Classification drives GL code into ERP
- Release To Production
- Change Management Closed Loop Enterprise wide with ERP integration
- All implemented consistently across Engineering enterprise wide
- All my previous presentations have been on functionality and implementing (climbing the mountain)
- Today I am talking about what you gain from implementation (the view from the top)

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## Users By Region

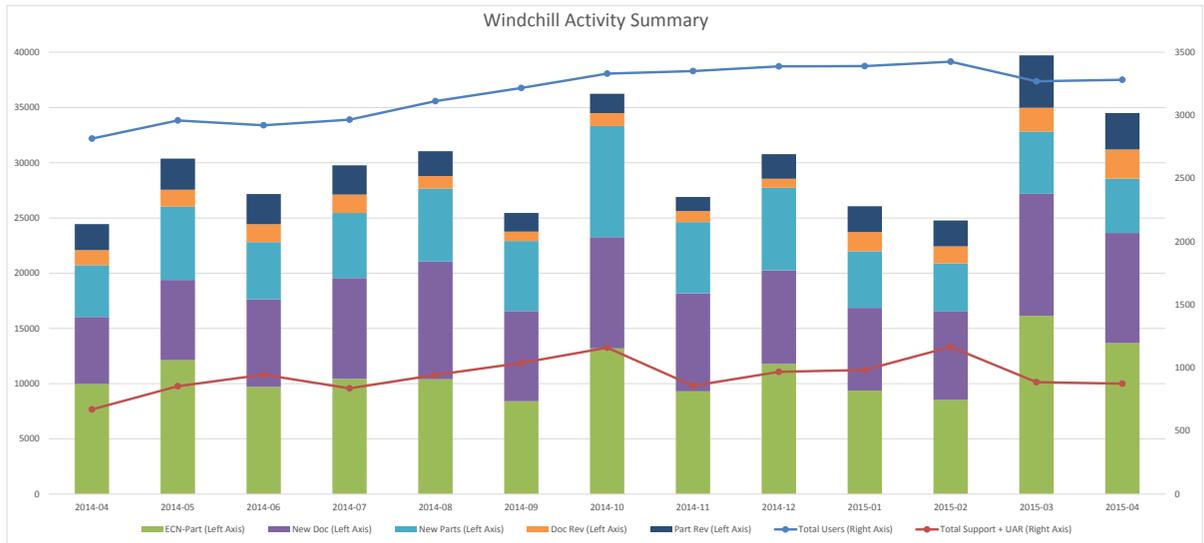
More than 800 PTC Creo Users, over 3000 PTC Windchill Users



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Based on objects being promoted (Released/Prototype/Etc.) per calendar month



Weatherford's Proven Business Advantages with PTC Windchill

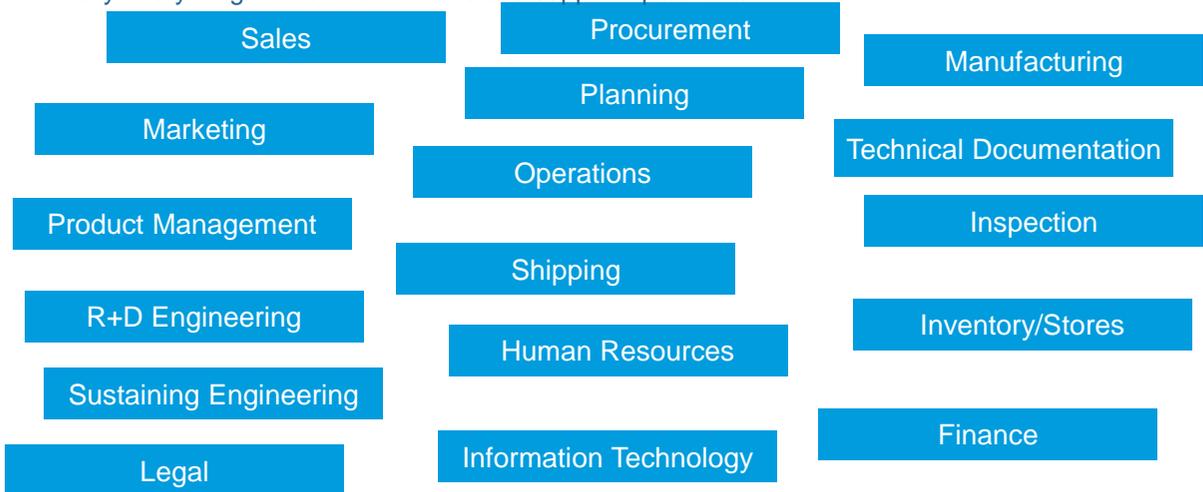
“business – a person, partnership, or corporation engaged in commerce, manufacturing, or a service; profit-seeking enterprise or concern.”

-dictionary.com

## Many Departments Make Up a Business

Weatherford Departments (not exhaustive)

- Mostly everything at Weatherford exists to support operations

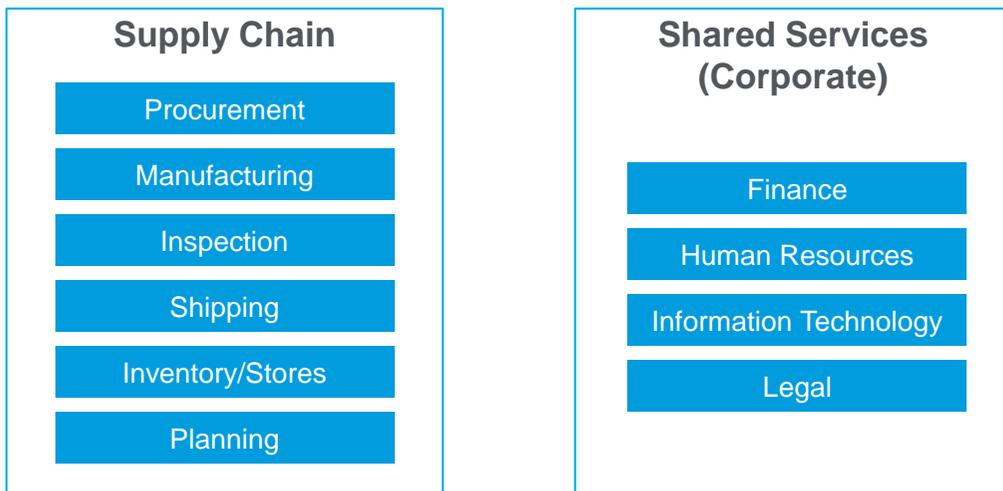


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## Many Departments Make Up a Business

Group some departments together to make discussion easier



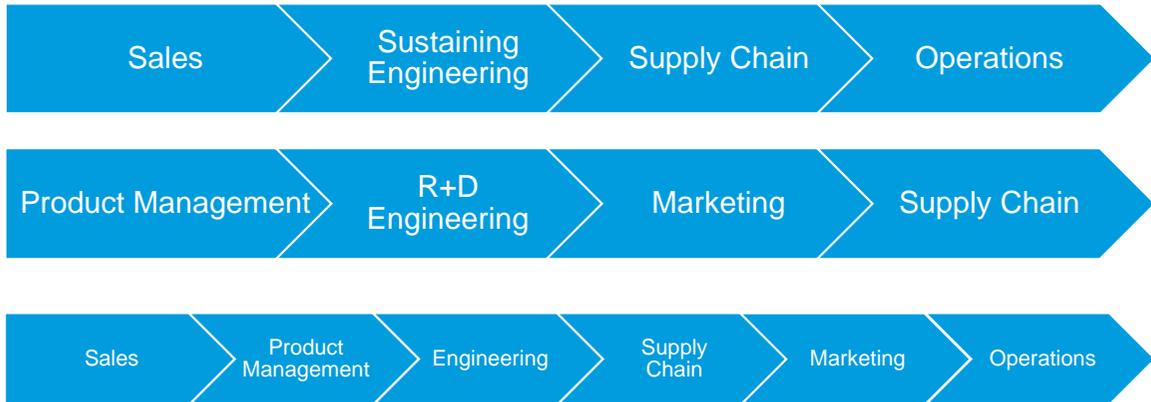
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## Information Flows Between Departments To Deliver Product/Service

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Some data flows for delivery to customer, Shared Services facilitate through the process



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## Business benefit is not always the same as Engineering benefit

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In general using PTC Windchill requires more work in Engineering



- Usually PTC Windchill replaces another system or method of operating and is more comprehensive
- Maintaining more information in any system is always going to be more work
- It is this extra information, associated process management and access control that adds value
- There are advantages in Engineering from using PTC Windchill, they come with a cost
- Typically the extra effort in Engineering brings benefits in other departments
- The process as a whole can be shorter and more efficient  
**(only if PTC Windchill replaces something or someone)**

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“Sometimes it is better to light a flamethrower than curse the darkness.”

“Build a man a fire, and he'll be warm for a day. Set a man on fire, and he'll be warm for the rest of his life.”

*-Sir Terry Pratchett (Author)*

## Business Benefits. Consistent Toolset and Process

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PTC Windchill is a tool to be used, it doesn't start like that, but over time that is how it ends up (if you are lucky/persistent)

- I asked an Engineering manager who has been using PTC Windchill since 2002 what business benefits it had brought to his group
- After he finished laughing he finally responded:  
“I don't even think of it as a system anymore, I have questions I need answered, it tells me”
- This is a really good illustration of one of the main business benefits, consistent process and toolset
- This makes it easier for Engineering staff to transition between groups/products
- It also makes data consumption more straightforward for Supply Chain and other data customers
- If Windchill is used/implemented consistently, a small team can support a large user community
- Weatherford have >3,000 users and a team of 10 supporting them 300:1
- Most of the systems PTC Windchill displaced were more typically 50:1 or less

“This isn't life in the fast lane, it's life in the oncoming traffic.”

*-Sir Terry Pratchett (Author)*

## Business Benefits. Consistent WTPart Data. CAD Re-use

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Although this is an obvious evolution when using a single integrated system, it was surprisingly difficult to achieve

- Weatherford adopted standard “core” attribute definitions and attribute values for some critical data
- Material Specification, Coating Specification, Weld Specification, Heat Treatment, Etcetera
- These attributes are maintained on the PTC Windchill WTPart. The CAD documentation associated to the WTPart does not duplicate those values
- The CAD data is purely geometry, all attributes defining the physical properties are on the PTC Windchill WTPart
- This facilitates easy re-use of CAD data to create something similar, e.g. same but different material
- Creating a new PTC Windchill WTPart with identical geometry but different physical properties takes a few seconds and does not require a license of CAD
- Maintaining less CAD data reduces costs for data management and Engineering changes

### WTPart Data

Basic Attributes	Number	Name	UOM
	02400847	Body, Hanger PH 10.750 65.7# VT P-P WS307	each
Described By	Document Number	Version	
	C004131367 (Drawing)	A.3	
	C004131368 (Model)	A.3	
Attribute	Value	Attribute	Value
COATING 2 SPECIFICATION	WC101	COATING 2 SPECIFICATION SUPPLEMENTS	S19
COATING SPECIFICATION	WC101	COATING SPECIFICATION SUPPLEMENTS	S19
HEAT TREATMENT SPECIFICATION	none	HEAT TREATMENT SPECIFICATION SUPPLEMENTS	S0 (none)
MARKING SPECIFICATION SUPPLEMENTS	S44	MATERIAL SPECIFICATION	WS307
MATERIAL SPECIFICATION SUPPLEMENTS	S4	MAXIMUM OUTSIDE DIAMETER	11.220 in

### CAD Data

Part = 02400847 A.3 / Material = WS307 S4

DRAWING UNITS: INCH [mm]		<b>WELL CONSTRUCTION</b>	SHEET : 1 OF 1		© Weatherford 2014. All rights reserved. This document is copyrighted and whether containing patentable or non-patentable subject matter, is and remains the proprietary and confidential information of Weatherford International Ltd. and by receiving this document the recipient agrees that this document is loaned in confidence with the understanding that neither it nor the information in it will be reproduced or disclosed, in whole or in part for any purpose except the limited purpose for which it is loaned. This document and any facilities hereof shall be returned to Weatherford International Ltd upon demand.
TOLERANCES (DRIVEN BY IMPERIAL SIZE)		Location: Spencer_Roed	SIZE : D		
INCH	mm	UNLESS OTHERWISE SPECIFIED	SCALE : 0.35	WEIGHT: 428.2	
X	±.12 [±0.04]	1 THREADS (25u in / 3.2mm) /	NAME: Body, Hanger PH 10.750 65.7# P-P		
X.X	±.025 [±0.001]	2 MACHINED SURFACES 250u in (6.3µm)	MODEL FILE	MODEL VERSION	3RD ANGLE
X.XX	±.010 [±0.25]	3 BREAK ALL DIMS 0.016 (0.40)	C004131368	A.3	DRAWING FILE
X.XXX	±.005 [±0.13]	4 X 45° OR RO.016 (0.40)	C004131367		DRAWING VERSION
ANGLES	X°±1/2°	5 0.031 (0.80) MAX CORNER RAD	A.3		A.3
		6 ALL DIAMETERS CONCENTRIC			
		7 WITHIN 0.010 (0.25) T.I.R.			
		8 THREAD ENTRY AND EXIT ANGLES TO BE 25-45° FROM THREAD AXIS			

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This is not something we set out to do, but it is a fantastic accidental benefit.

- Each WTPart corresponds to a single Item in ERP
- All PTC Windchill WTPart attribute data is made available to a number of downstream systems;
  - Business Reporting
  - Endeca (Search Index)
  - Amber Road (Compliance)
  - VCS (Vendor Communication System)
- The PTC Windchill WTPart attribute data combined with ERP data allows fantastic reporting
  - The business analysis this supports has benefitted supply chain many times
- The accurate and consistent PTC Windchill WTPart attribute data supports automated downstream processes
- In some cases decisions can be made without needing a human to review documentation
- Engineering change is handled by the same processes as new data, ensuring maintenance

Weatherford's Proven Business Advantages with PTC Windchill

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This is something we set out to do, it works well

- All PTC Windchill WTParts are classified, supporting search and retrieval by attribute data
- Many of our library parts also have CAD data associated
- O-rings (a critical component) in particular have had significant time spent on ensuring good data
- This makes it easy for an Engineer to find a component for their design and use the CAD
- In 2015 (by May), Weatherford Engineering used over 7000 O-rings in new Releases
- Compared to how library parts were previously handled, this saves at least 5 minutes/component
- The re-use is also beneficial for Supply Chain, this is an ongoing/recurring saving

Part - 00767675, O-ring -124 WE203 (HNBR 70 standard) SAE A5568, A.6 (Design)

Visualization and Attributes | Weatherford Attributes | More Attributes

**Visualization and Attributes**

Name: O-ring -124 WE203 (HNBR 70 standard) SAE A5568  
 Status: Checked in  
 Modified By: ptload(Admin)  
 Last Modified: 2014-01-23 05:00 CST  
 Classification: Enterprise Shared Parts \ Gaskets-Rings and Seals \ Rings \ O-ring-standard size

Number	File Name	Version	Name	Context	Association
CO01800306	CP400877.IPT	A.2	O-RING #2-124 HSN 70	Enterprise Shared Documents	Image
CO00170656	00767675.prt	A.4	O-ring -124 WE203	Enterprise Shared Documents	Owner

“Nothing I can say or devise, and nothing anybody else can say or devise, is going to be perfect.”

-Sir Terry Pratchett (Author)

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ADVANTAGE<sup>™</sup>