AUTODESK **UNIVERSITY** 2015

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A PLM Case Study – Fanning the Flames of Innovation

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Learning Objectives

- See how Autodesk PLM 360 was quickly implemented and adopted for the Ember product
- Learn about Bill of Materials and Change Management during the Ember development process
- See how PLM 360 is used for Supply Chain, Quality, and Compliance tracking with the Ember
- Learn how Autodesk PLM 360 is well suited for next-generation customers

Your AU Experts

Brian Schanen

Brian Schanen works for Autodesk as a Product Manager for Autodesk PLM 360. He is responsible for evangelizing Autodesk PLM and Data Management both internally and externally, ensuring customer success with PLM. This includes building and delivering materials for nurturing prospects, customers, and the partner channel on Autodesk PLM and PDM solutions. With 14 years of PLM/PDM experience, he is an Autodesk University veteran speaker, and on any given day, you can find him coaching prospects, mentoring new customers, and even assisting in deployments of Autodesk PLM.

Laruent Rains

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Introduction

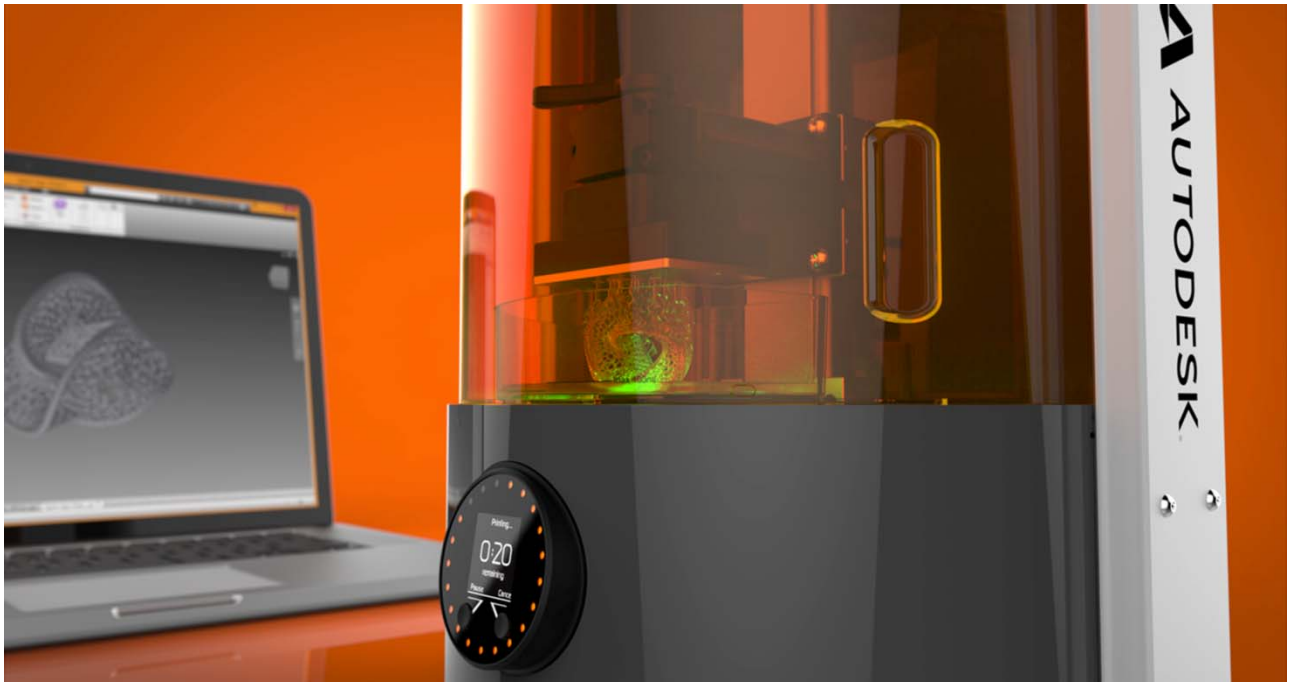
In this class we'll take an in-depth look at the use of Autodesk PLM 360 with the Ember - Autodesk's Spark Powered, ultra high resolution 3D printer.

You'll see how the Ember development team implemented PLM 360 and overcame challenges with Bill of Material management, the ebb and flow of Change Orders, and Supplier management in bringing this product to market.

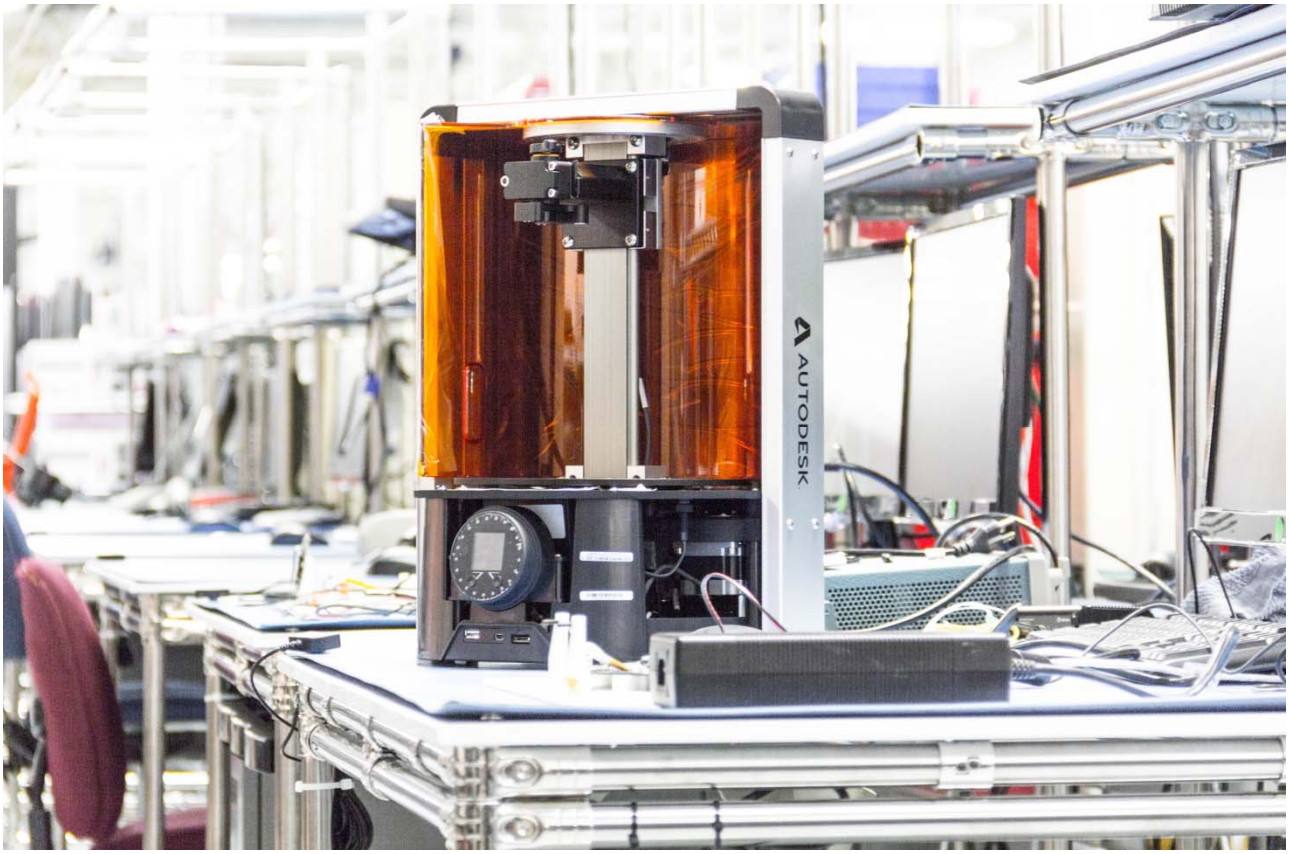
Watch how initial data was imported to Autodesk PLM 360, then how Autodesk PLM 360 was tailored for the different workflows and teams of users - from internal to contract manufacturers. Quality management, along with Compliance tracking within Autodesk PLM 360 will also be highlighted in this course. Come and see how a company operated within a company, and leveraged Autodesk PLM 360.

Ember Defined

The Ember 3D printer is an SLA (stereolithography) printer from Autodesk. Ember works with digital light processing (DLP) to cure the photosensitive resin, layer by layer providing the high resolution needed in industries like jewelry, dental and small scale prototyping.



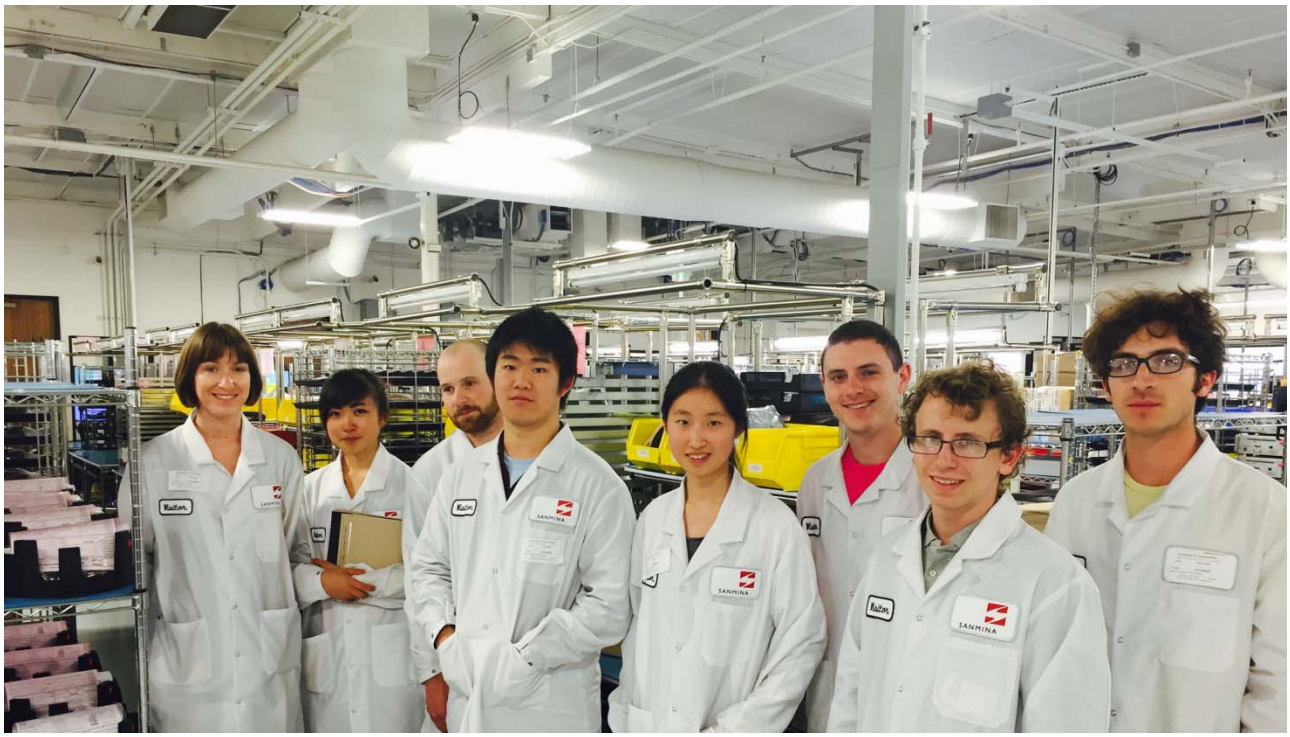
Autodesk built Ember specifically to take full advantage of the power and flexibility of their new Spark 3D printing platform. Spark is an open platform that provides a common foundation for building 3D printing software, hardware, and materials. Ember's print preparation software, Autodesk Print Studio, was built using the Spark Platform's APIs and algorithms. Autodesk will also embed Spark Powered 3D printing functionality into our full range of professional design tools, beginning with Fusion 360 and Inventor.This will provide our customers with a more streamlined workflow, by preparing, optimizing and outputting their 3D models directly to Ember.



Why Hardware?

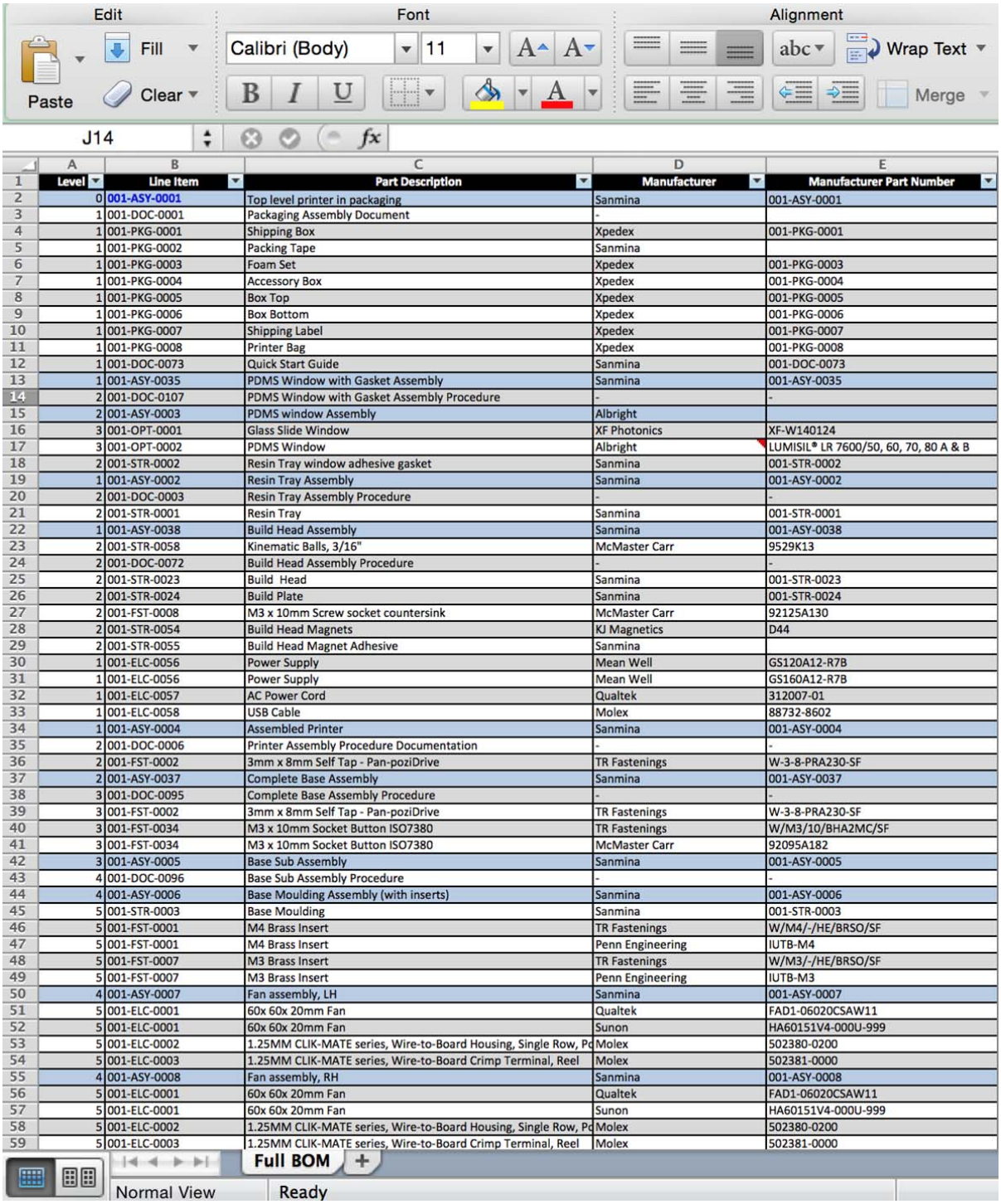
3D printing will be an essential part of how things are made. Last year, Autodesk announced the launch of the open Spark 3D printing platform to help advance the entire 3D printing industry including hardware, software, materials and services. The most effective way to understand hardware is to make Hardware so the Ember printer was developed and released for sale.

Within Autodesk, the Ember team operated as a start up. The team was lean with roughly 12 people, and in the summer this rises to about 20 people. This team was mostly engineers, with a Project and Production Manager. The Ember is manufactured int he US, with a contract manufacturer in San Jose, CA.



Life Before PLM 360

As with many startup companies, there were a variety of tools utilized in the development process. Out of necessity and because the teams were spread out, the usual go-to collaborative tools were employed. These included Google Drive share, Google Docs spreadsheet, MS Excel for Change Orders (ECO), and email.

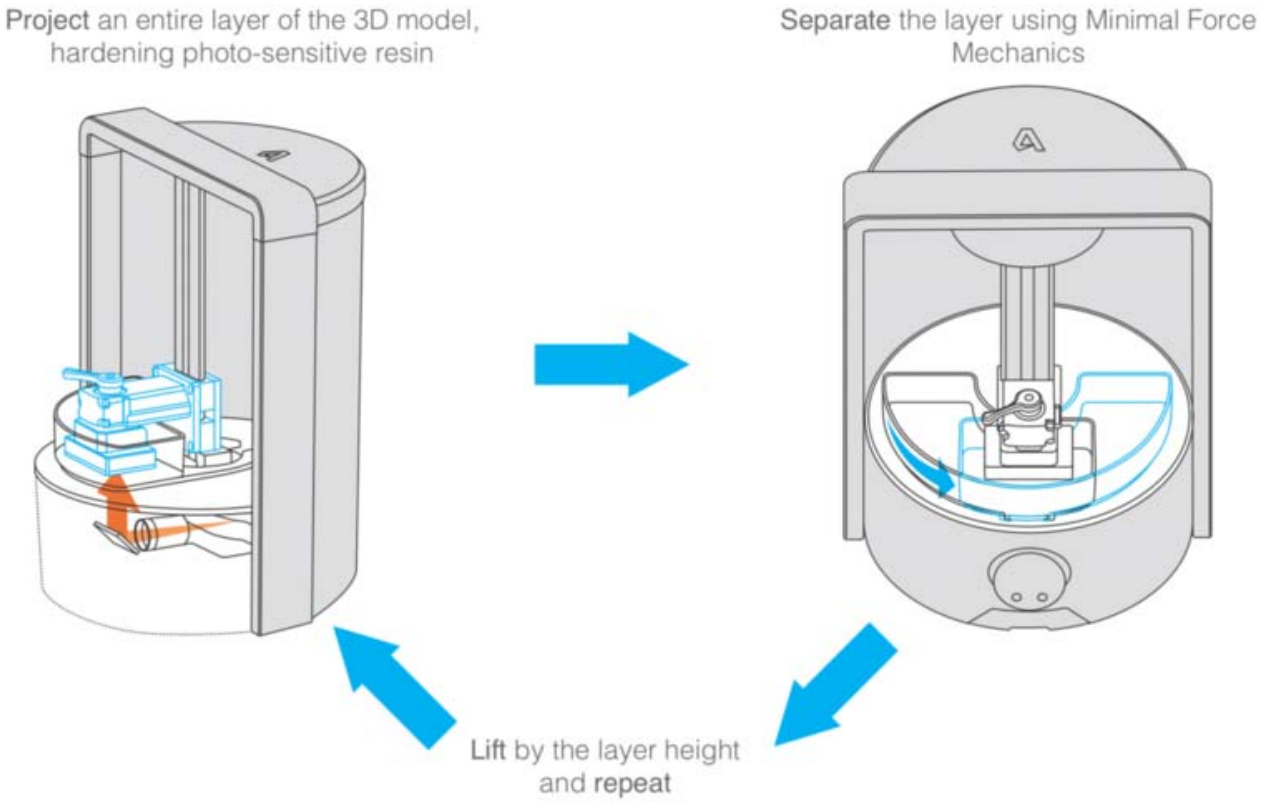


Level	Line Item	Part Description	Manufacturer	Manufacturer Part Number
0	001-ASY-0001	Top level printer in packaging	Sanmina	001-ASY-0001
1	001-DOC-0001	Packaging Assembly Document	-	
1	001-PKG-0001	Shipping Box	Xpedex	001-PKG-0001
1	001-PKG-0002	Packing Tape	Sanmina	
1	001-PKG-0003	Foam Set	Xpedex	001-PKG-0003
1	001-PKG-0004	Accessory Box	Xpedex	001-PKG-0004
1	001-PKG-0005	Box Top	Xpedex	001-PKG-0005
1	001-PKG-0006	Box Bottom	Xpedex	001-PKG-0006
1	001-PKG-0007	Shipping Label	Xpedex	001-PKG-0007
1	001-PKG-0008	Printer Bag	Xpedex	001-PKG-0008
1	001-DOC-0073	Quick Start Guide	Sanmina	001-DOC-0073
1	001-ASY-0035	PDMS Window with Gasket Assembly	Sanmina	001-ASY-0035
2	001-DOC-0107	PDMS Window with Gasket Assembly Procedure	-	-
2	001-ASY-0003	PDMS window Assembly	Albright	
3	001-OPT-0001	Glass Slide Window	XF Photonics	XF-W140124
3	001-OPT-0002	PDMS Window	Albright	LUMISIL® LR 7600/50, 60, 70, 80 A & B
2	001-STR-0002	Resin Tray window adhesive gasket	Sanmina	001-STR-0002
1	001-ASY-0002	Resin Tray Assembly	Sanmina	001-ASY-0002
2	001-DOC-0003	Resin Tray Assembly Procedure	-	-
2	001-STR-0001	Resin Tray	Sanmina	001-STR-0001
1	001-ASY-0038	Build Head Assembly	Sanmina	001-ASY-0038
2	001-STR-0058	Kinematic Balls, 3/16"	McMaster Carr	9529K13
2	001-DOC-0072	Build Head Assembly Procedure	-	-
2	001-STR-0023	Build Head	Sanmina	001-STR-0023
2	001-STR-0024	Build Plate	Sanmina	001-STR-0024
2	001-FST-0008	M3 x 10mm Screw socket countersink	McMaster Carr	92125A130
2	001-STR-0054	Build Head Magnets	KJ Magnetics	D44
2	001-STR-0055	Build Head Magnet Adhesive	Sanmina	
1	001-ELC-0056	Power Supply	Mean Well	GS120A12-R7B
1	001-ELC-0056	Power Supply	Mean Well	GS160A12-R7B
1	001-ELC-0057	AC Power Cord	Qualtek	312007-01
1	001-ELC-0058	USB Cable	Molex	88732-8602
1	001-ASY-0004	Assembled Printer	Sanmina	001-ASY-0004
2	001-DOC-0006	Printer Assembly Procedure Documentation	-	-
2	001-FST-0002	3mm x 8mm Self Tap - Pan-poziDrive	TR Fastenings	W-3-8-PRA230-SF
2	001-ASY-0037	Complete Base Assembly	Sanmina	001-ASY-0037
3	001-DOC-0095	Complete Base Assembly Procedure	-	-
3	001-FST-0002	3mm x 8mm Self Tap - Pan-poziDrive	TR Fastenings	W-3-8-PRA230-SF
3	001-FST-0034	M3 x 10mm Socket Button ISO7380	TR Fastenings	W/M3/10/BHA2MC/SF
3	001-FST-0034	M3 x 10mm Socket Button ISO7380	McMaster Carr	92095A182
3	001-ASY-0005	Base Sub Assembly	Sanmina	001-ASY-0005
4	001-DOC-0096	Base Sub Assembly Procedure	-	-
4	001-ASY-0006	Base Moulding Assembly (with inserts)	Sanmina	001-ASY-0006
5	001-STR-0003	Base Moulding	Sanmina	001-STR-0003
5	001-FST-0001	M4 Brass Insert	TR Fastenings	W/M4/-/HE/BRSO/SF
5	001-FST-0001	M4 Brass Insert	Penn Engineering	IUTB-M4
5	001-FST-0007	M3 Brass Insert	TR Fastenings	W/M3/-/HE/BRSO/SF
5	001-FST-0007	M3 Brass Insert	Penn Engineering	IUTB-M3
4	001-ASY-0007	Fan assembly, LH	Sanmina	001-ASY-0007
5	001-ELC-0001	60x 60x 20mm Fan	Qualtek	FAD1-06020CSAW11
5	001-ELC-0001	60x 60x 20mm Fan	Sunon	HA60151V4-000U-999
5	001-ELC-0002	1.25MM CLIK-MATE series, Wire-to-Board Housing, Single Row, Pc	Molex	502380-0200
5	001-ELC-0003	1.25MM CLIK-MATE series, Wire-to-Board Crimp Terminal, Reel	Molex	502381-0000
4	001-ASY-0008	Fan assembly, RH	Sanmina	001-ASY-0008
5	001-ELC-0001	60x 60x 20mm Fan	Qualtek	FAD1-06020CSAW11
5	001-ELC-0001	60x 60x 20mm Fan	Sunon	HA60151V4-000U-999
5	001-ELC-0002	1.25MM CLIK-MATE series, Wire-to-Board Housing, Single Row, Pc	Molex	502380-0200
5	001-ELC-0003	1.25MM CLIK-MATE series, Wire-to-Board Crimp Terminal, Reel	Molex	502381-0000

In addition, part numbering was based off of an xls sequence. Revisions, while used, were tied to the file name of Bill of Materials in .xls format. BoMs for sub assemblies followed no standard format, as they were derived from various CAD and PCB design systems.

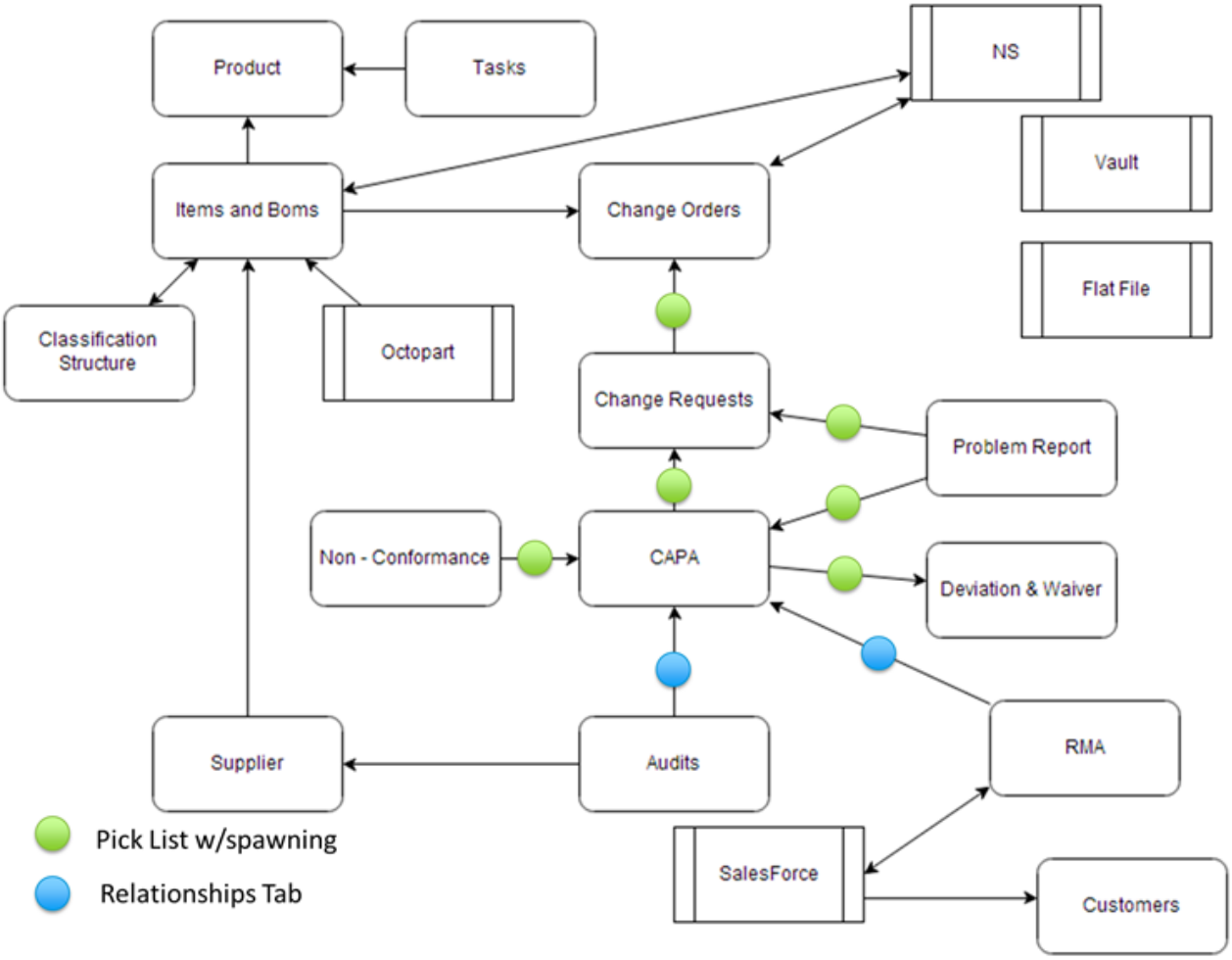
Introducing PLM 360

Through internal discussions at Autodesk, the Ember team and PLM 360 technical experts got together to discuss the challenges with bringing Ember to production. Though the Ember team was technically Autodesk, they exhibited the same core challenges our next generation customers - an ideal fit and right in the core capabilities of Autodesk PLM 360.



Mentoring on PLM 360

With the challenges defined and team members established, the next step was to procure a PLM tenant for the Ember team. This PLM site was set up based off of a template tenant that all customers, resellers, and trial prospects get as a starting point with PLM 360. It has out-of-the-box Workspaces pre-built for Product development, Items & BoMs, Change Orders, Supplier Tracking, and more. Weekly meetings were established and the decision was made to tackle the Bill of Materials problem first.



Managing Items and BoMs

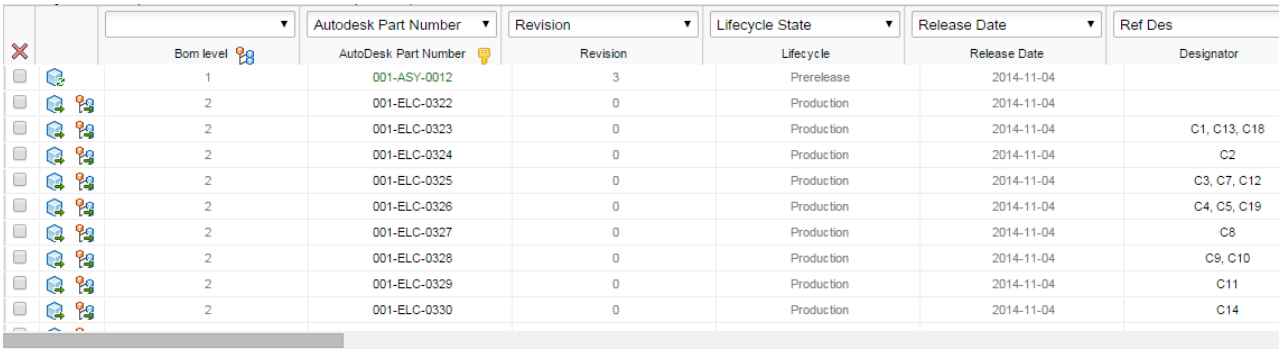
The details about the Ember - Items, part numbers, descriptions, manufacturing part numbers, cost, revisions - all of this was housed in several different formats, separate locations, and in separate spreadsheets. The initial steps were to compile the latest data, and load it into Autodesk PLM 360.

The Import Process

The good news, if any, about using spreadsheets for Item and Bill of Material management is the ability to import this data directly into PLM 360. The Import tool is a core part of Autodesk PLM 360. It can be run by anyone with the appropriate permissions to do so within PLM 360. Note: setting up these privileges is an Administrative function.

Bom level	AutoDesk Part Number	Designator	Quantity	Value	Comment	Description
3	001-ASY-0012		1		**Isaac UI PCBA**	**Isaac UI PCBA 520-0003-003 Rev A**
4	001-ELC-0322		1		Isaac UI PCBA Bare PCB	Isaac UI PCBA Bare PCB; Source: "Isaac UI_410-0003-003_2014-09-
4	001-ELC-0323	C1, C13, C18	3	4.7uF	CAP 4.7uF 50V 0805(2012)	CAP 4.7uF 50V ±20% 0805 (2012 Metric) Thickness 1.45mm SMD
4	001-ELC-0324	C2	1	10nF	10nF 50V 0603(1608)	CAP 10nF 50V ±10% 0603 (1608 Metric) Thickness 1mm SMD
4	001-ELC-0325	C3, C7, C12	3	0.1uF	CAP 0.1uF 50V 0603(1608)	CAP 0.1uF 50V ±10% 0603 (1608 Metric) Thickness 1mm SMD
4	001-ELC-0326	C4, C5, C19	3	0.1uF	CAP 0.1uF 6V3 0402	CAP 100nF 6.3V ±20% 0402 (1005 Metric) Thickness 0.6mm SMD
4	001-ELC-0327	C8	1	4.7uF	TAJB475K020R	Capacitor, Tantalum, 4.7uF 10% 20V MCCT-B (3528)
4	001-ELC-0328	C9, C10	2	1.0uF	CAP 1.0uF 16V 0603(1608)	CAP 1.0uF 16V ±10% 0603 (1608 Metric) Thickness 1mm SMD
4	001-ELC-0329	C11	1	10uF	CAP 10uF 25V 0805(2012)	CAP 10UF 25V ±10% 0805 (2012 Metric) Thickness 0.8mm SMD
4	001-ELC-0330	C14	1	120pF	CAP 120pF 50V 0402	CAP CER 120PF 50V 5% NP0 0402
4	001-ELC-0331	C17	1	10nF	CAP 10nF 50V 0603(1608)	CAP 10nF 50V ±10% 0603 (1608 Metric) Thickness 1mm SMD
4	001-ELC-0332	D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21	21		LTST-C170AKT	LED ORANGE CLEAR 0805 SMD
4	001-ELC-0333	D22, D23	2		PMEG3010CEH	very low VF MEGA Schottky barrier rectifiers
4	001-ELC-0334	D24	1		BAT54	Schottky Barrier Diode
4	001-ELC-0335	DISPLAY	1		DD-128128FC-6A	Univision UG2828GDEDF11 Display (mechanical only)
4	001-ELC-0336	FB1	1		BLM15PD121SN1D	FERRITE 120OHM @ 1GHZ 1300MA SMT 0402

The Bill of Material data living within spreadsheets needed a little cleansing. PLM 360 will map fields that do not match in name or syntax, but once you get the pattern right you can quickly import items, hierarchy, cost, suppliers, and more.



	Bom level	AutoDesk Part Number	Revision	Lifecycle	Release Date	Designator
	1	001-ASY-0012	3	Prerelease	2014-11-04	
	2	001-ELC-0322	0	Production	2014-11-04	
	2	001-ELC-0323	0	Production	2014-11-04	C1, C13, C18
	2	001-ELC-0324	0	Production	2014-11-04	C2
	2	001-ELC-0325	0	Production	2014-11-04	C3, C7, C12
	2	001-ELC-0326	0	Production	2014-11-04	C4, C5, C19
	2	001-ELC-0327	0	Production	2014-11-04	C8
	2	001-ELC-0328	0	Production	2014-11-04	C9, C10
	2	001-ELC-0329	0	Production	2014-11-04	C11
	2	001-ELC-0330	0	Production	2014-11-04	C14

For a deep-dive on the import process, including tailoring PLM for your needs, please watch this 6 part video tutorial: https://www.youtube.com/playlist?list=PLQ_I2j-3dBCMGws_5Hzb3bF5jNyq2ulZd

Regarding Part Numbering

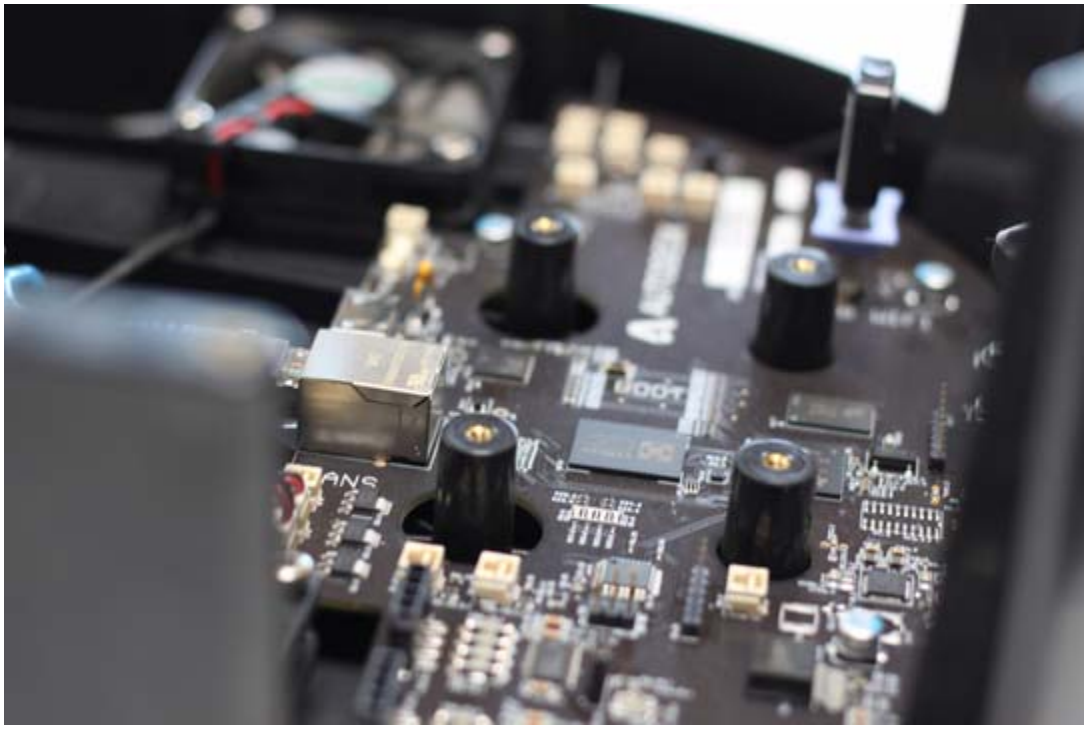
Part numbering outside of a management system is also prone to errors. In this case, it was based in xls, has a numeric prefix for the product line, followed by a three letter category, followed by a numeric sequence. All of this delineated by dashed. While this format is fine, the process of sequencing is manual. Autodesk PLM 360 comes with a configurable Part Numbering generator, allowing you to 'teach' PLM your numbering scheme. This is based off an included Classification system within PLM 360, giving you the ability to define your product lines and rules for assigning Item numbers, descriptions, and building component catalogs.

#	Item
1	001-ELC-0314 - CRYSTAL 32.768KHZ 12.5PF SMD [REV:1]
2	001-ELC-0315 - OSC 24.576MHZ 3.3V SMT [REV:1]
3	001-DOC-0145 - Build Head with Brass Inserts Assembly Procedure [REV:1]
4	001-ELC-0312 - CRYSTAL 24.000MHZ 18PF SMD [REV:1]
5	001-ELC-0313 - XTAL 25MHZ 30PF SMT [REV:1]
6	001-ELC-0311 - EEPROM 256Kb I2C SOIC8 [REV:1]
7	001-DOC-0150 - Projector Serial Number Label [REV:1]
8	001-DOC-0151 - Resin Tray Serial Number Label [REV:1]
9	001-ELC-0367 - Non-Inverting Buffer / CMOS Logic level Shifter with LSTTL-Compatible Inputs [REV:1]
10	001-ELC-0309 - IC INVERTER SINGLE 1INPUT SC705 [REV:1]
11	001-ELC-0310 - DUAL BUFFER/DRIVER WITH 3-STATE OUTPUTS [REV:1]
12	001-ELC-0307 - MAX6818 Octal DeBounce [REV:1]

Configuring Fields

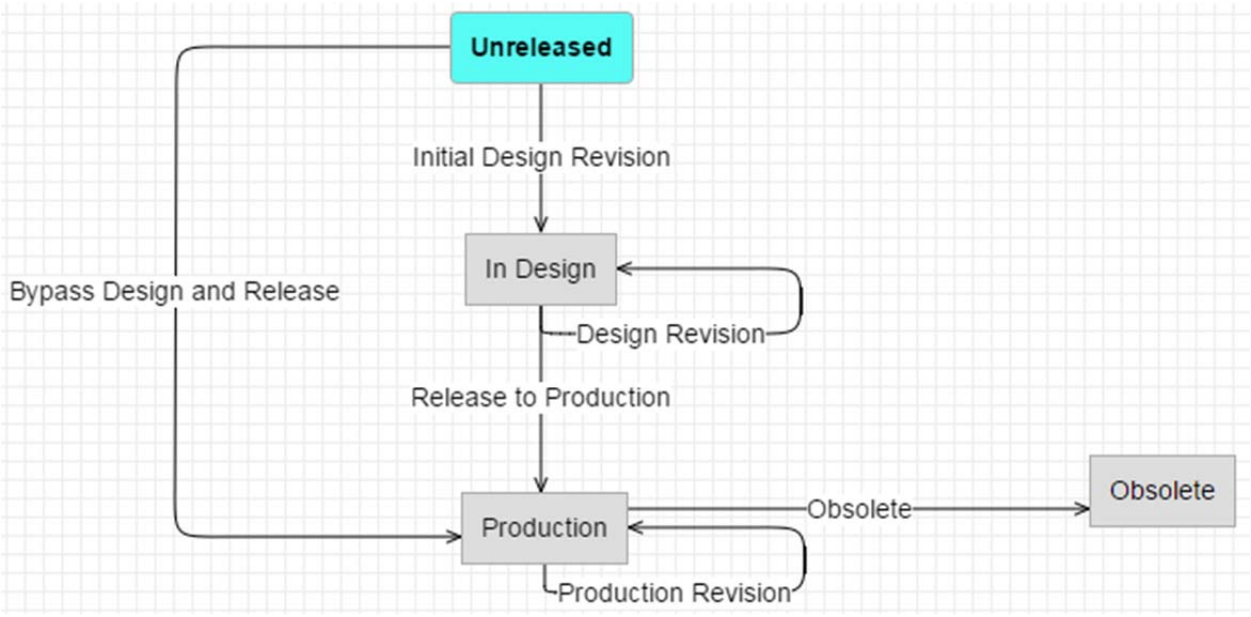
Autodesk PLM 360 tenants come with Workspaces, and those Workspace contain Fields. You may also know these as properties or metadata. There are both system fields that are intrinsic and configurable fields of various data types that can be created or altered to match the needs of the product.

The Administration side of PLM 360 contains the Workspace Manager, and this is where a Workspace can be tailored to exactly what a company needs. In the case of Ember, the terminology was inline with the out-of-the-box PLM tenant for the most part, with only a few modifications needed.



Revision Management

Revision and Lifecycle Management is another core part of Autodesk PLM 360. The process to move from Work in Process to Released/Production, the automated Revisioning, and rules around access is a significant benefit of PLM. Added to this is the ability to view historic releases, and compare Items and Bill of Materials of a product. Autodesk PLM 360 is configurable here too, with the ability to use numeric or alpha Revision schemes (all numeric in the case of Ember).



Managing Engineering Change

With the product data loaded into PLM 360, along with revision rules, field names and nomenclature, the next step was to gain control of the change process. As with the Items and Bill of Materials, this process leveraged a combination of email and spreadsheet forms to nominate, approve, and sign off on changes to the Ember.

Related Change Information Attached *(must use as part of the ECR review and release process and must be completed to receive approval for ECN*

☐ Marked/revised drawing	☐ User Manual	☐ Test system(s)
☐ Marked BOM	☐ Standard Operation Guide	☐ Assembly/process
☐ Circuit design/Gerber	☐ Appearance/ID	
☐ Production tooling (Please describe) _____	☐ Other *(please describe)* _____	

ITEMS AFFECTED *(check all items that might apply) - ECN*

☐ Engineering /Design Functionality	☐ Packaging	☐ Service Requirements
☐ Tooling	☐ Labeling	☐ Supplier Tooling/Instrumentation
☐ Fixtures & Equipment	☐ Performance Spec	☐ BOM
☐ Gages	☐ Safety	☐ Documentation
☐ Validation	☐ Volumes	☐ Work Instructions/Procedures
☐ Piece Cost	☐ Material Specs	☐ Environmental Impact
☐ Obsolescence	☐ Mass/Size	☐ Floor Space/ Storage
☐ Standards *(i.e. MFi, Bluetooth SIG Certs etc.)*	☐ Warranty	☐ Test Systems
☐ Certification/Compliance *(i.e. FCC, CE, CCC etc.)*	☐ Prototype	☐ Provisioning Systems
☐ Shipping/Receiving	☐ Dimensional/Tolerance	☐ Other (Describe) _____
☐ Inventory	☐ Styling/Appearance/Color	

INVENTORY PLANNING *(required for ECN)*

	Units	Unit Cost	Extended cost
	N/A	N/A	N/A
	-	$ -	0.00

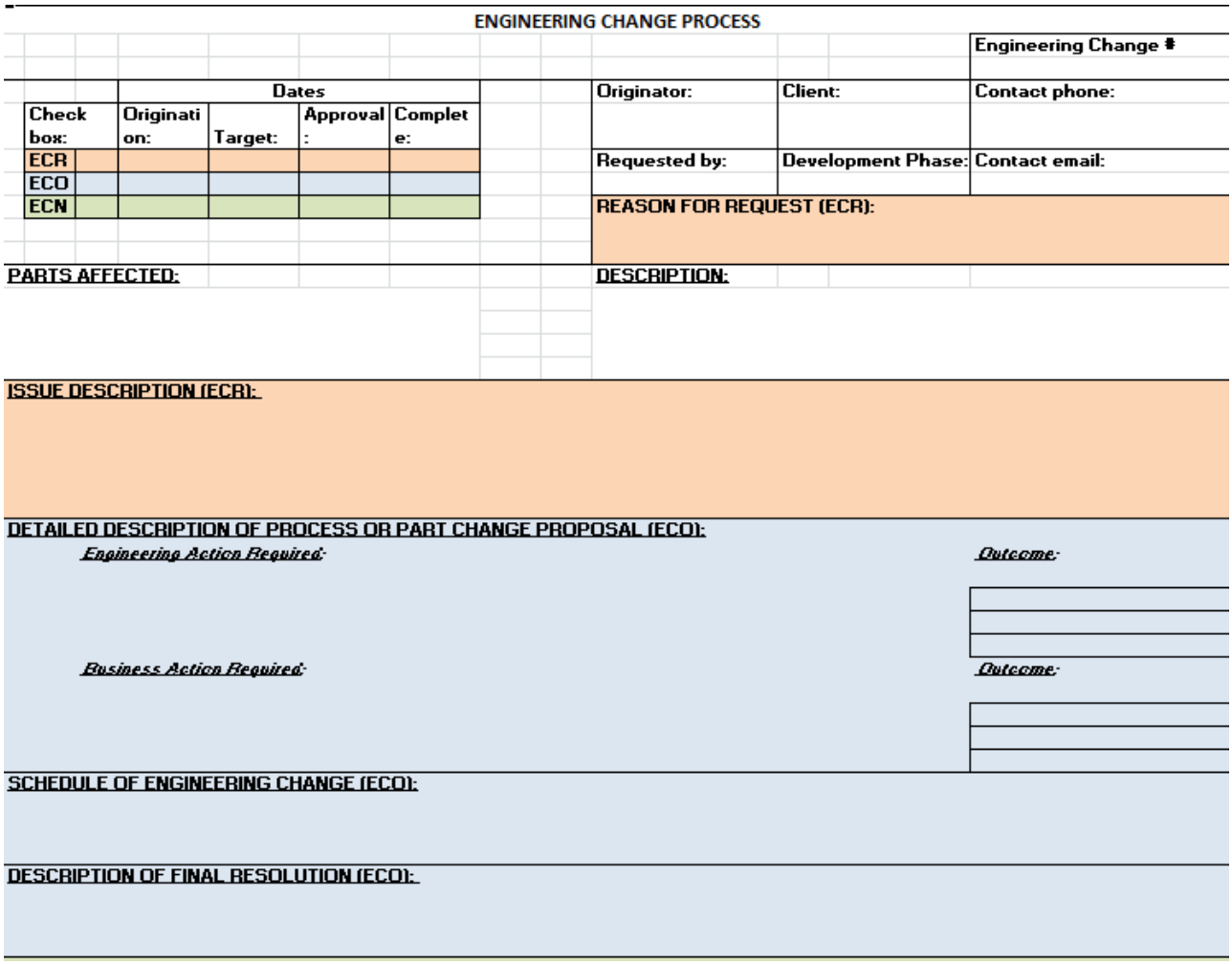
☐ Supplier(s) bank required before change	☐ Running change (use until depleted)
☐ Internal/CM bank required before change	☐ Rework All inventory (immediate)
☐ No effect	☐ Rework All inventory (after ECN complete)
☐ Scrap material	☐ Coordinated change
☐ WIP (date code change)	

APPROVALS (ECR & ECO):

	Name:	Signature:	Date:
Originator:			
Project Manager:			
Manufacturing Ops:			
CM			
Client Representative:			
Industrial Engineering Lead:			
Mechanical Engineering Lead:			
Electrical Engineering Lead:			

Customizing the ECO form & Workflow

Change Management in Autodesk PLM 360 is foundational to the product development process. The Change Order Workspace is tethered to the Items and BoMs Workspace to provide the reason for a change, collect and reserve the affected Items, notify the participants, and house the signoff and approvals for all modifications. The out-of-the-box tenant comes with a pre-built form for capturing all pertinent change data, and a Workflow with two routing paths.



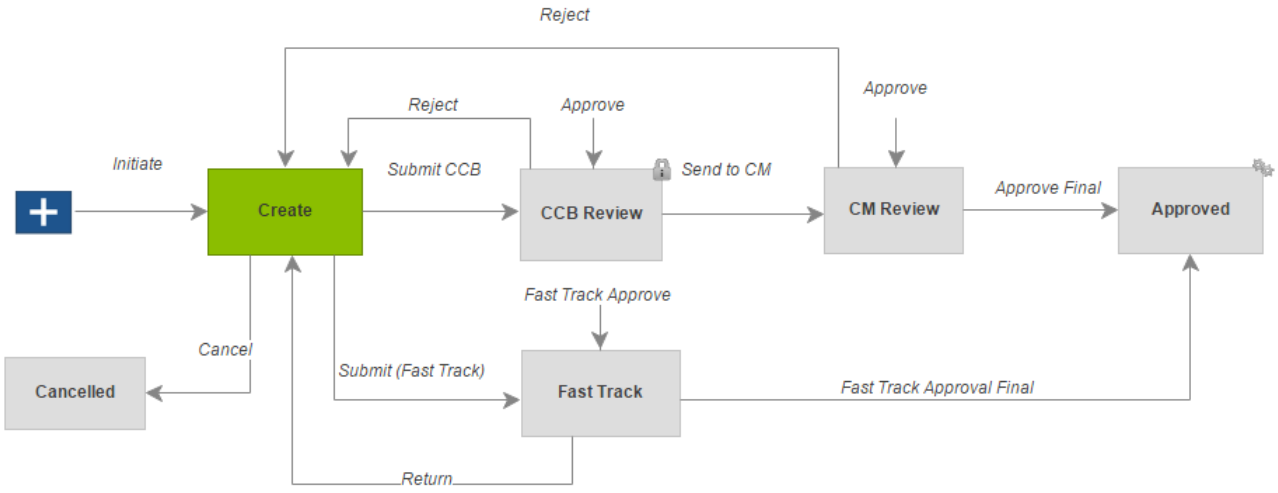
ENGINEERING CHANGE PROCESS

								Engineering Change #
		Dates				Originator:	Client:	Contact phone:
Check box:		Origination:	Target:	Approval:	Complete:			
ECR						Requested by:	Development Phase:	Contact email:
ECO								
ECN						REASON FOR REQUEST (ECR):		
PARTS AFFECTED:						DESCRIPTION:		
ISSUE DESCRIPTION (ECR):								
DETAILED DESCRIPTION OF PROCESS OR PART CHANGE PROPOSAL (ECO):								
Engineering Action Required:						*Outcome:*		
Business Action Required:						*Outcome:*		
SCHEDULE OF ENGINEERING CHANGE (ECO):								
DESCRIPTION OF FINAL RESOLUTION (ECO):								

The fields and workflow map in PLM is configurable as well. In the case of the Ember team, they had used an Excel template form, and upon inspection, it was determined that the fields, prompts, and data entry on this manual form had equivalent fields and representation inside of the Change Order Workspace in PLM 360. Only slight modifications were made to the Affected Items tab to call out change reasons.

From	To	Change Reason	Change Request	Action
1	OBS	Part Retired	This part is being retired. Please send scrap to Pier 9.	
1	OBS	Part Retired	This part is being retired.	
	1	New Part	Please add 1 unit to the finishing kit. CONSIGNED PART	
	1	New Part	Please add 2 units to the finishing kit. CONSIGNED PART	

Moving the change process to PLM centralized and standardized the changes to the Ember as it moved through various validation stages. All revisions to components and assemblies can be traced back to a Change Order for historic purposes.



Print Views

The change process within PLM 360 is configurable in both fields, workflow, and visibility. In addition, each Workspace has the ability to provide a 'print friendly' view of the Change Order. This is configurable to show or hide fields, affected items, sign offs & approvals, etc. In the case of the Ember, this is currently sent to select contract manufacturers for communicating change.

Summary	
Number	CO000014
Title	Update AML 001-ELC-0054
Routing Type	Normal
Priority	MED

Details	
Change Reason Code	Functional Fix
Description of Change	Change AML of 001-ELC-0054

Linked Items

#	Item	Change Reason	Change Request
1	001-ASY-0001 - Top level printer in packaging [REV:7]	Children Change	
2	001-ASY-0015 - Central Moulding and Motor Assembly [REV:10]	Children Change	
3	001-ELC-0054 - 6" Cat5e Ethernet Cable [REV:2]	AML Change	
4	001-FST-0073 - Torx M3.12 x 8mm Length Thread-Forming Screw for Plastics [REV:2]	AML & Description Change	
5	001-FST-0074 - 3mm x 12mm Pozi Pan Head Plastite Screws [REV:2]	AML Change	
6	001-FST-0075 - M3 x 22mm Socket Button ISO7380 [REV:1]	New Part	
7	001-FST-0076 - No.4 x 0.312 Imperial Flat Washers [REV:2]	AML & Description Change	
8	001-FST-0077 - M3 x 10 Countersunk Screw [REV:1]	New Part	
9	001-PKG-0013 - Rotating Window Shipping Tape [REV:2]	AML Change	

Compare & Redline BoM

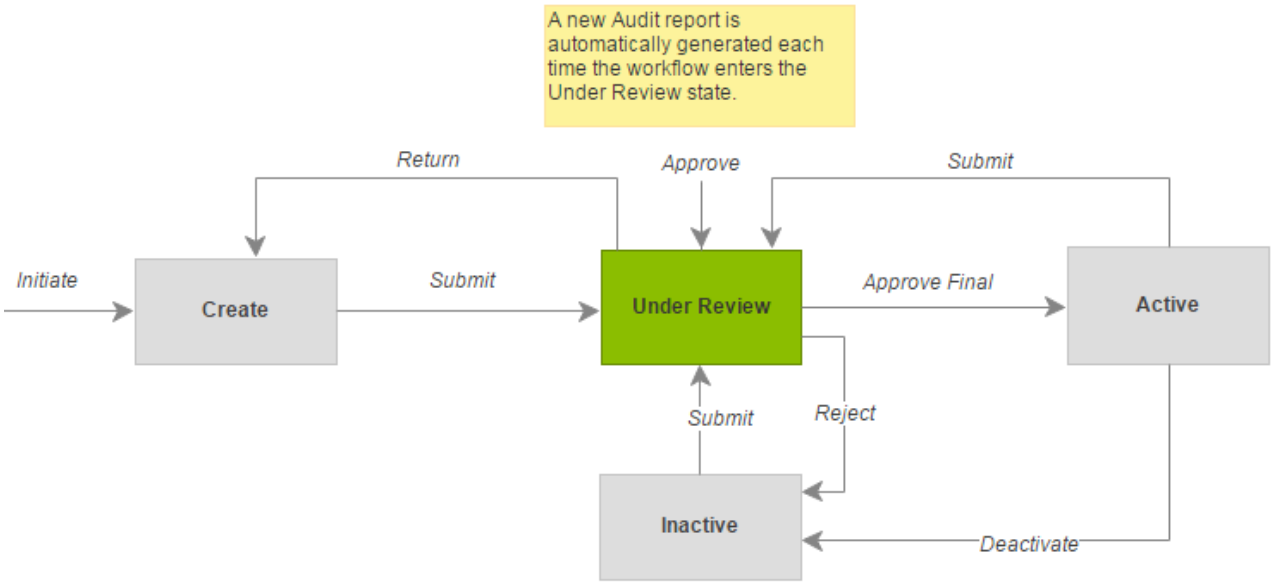
Before, during, and after a change, PLM 360 allows you to compare or redline a Bill of Materials. Technically, every released to production revision of either a component or Bill of Material has a potential 'next version' available. In the midst of a proposed Change Order, a comparison can be made either from the Change Order or the Bill of Materials.This has proven useful in exposing proposed change and communicating the effect of a revision bump within PLM 360.

31	3.3	Change	To	001-DOC-0145	1	Build Head with Brass Inserts Assembly Procedure	false	true	0.0	Ea			Prerelease
32	3.3	Change	From	001-DOC-0145	~~WIP~~	Build Head with Brass Inserts Assembly Procedure	false	true	0.0	Ea			~~Working~~
33	3.4			001-FST-0083	1	M3 Brass Insert - 4.74 x 12mm	true	false	2.0	Ea			Production
34	2.10	Change	To	001-FST-0077	1	M3 x 10 Countersunk Screw	true	false	2.0	Ea			Production
35	2.10	Change	From	001-FST-0077	~~WIP~~	M3 x 10 Countersunk Screw	true	false	2.0	Ea			~~Working~~
36	2.11			001-STR-0056	1	Epoxy Adhesive	true	false	0.0	oz	-	-	Production

Tracking Suppliers

Supplier Workspace and Auditing, Tracking

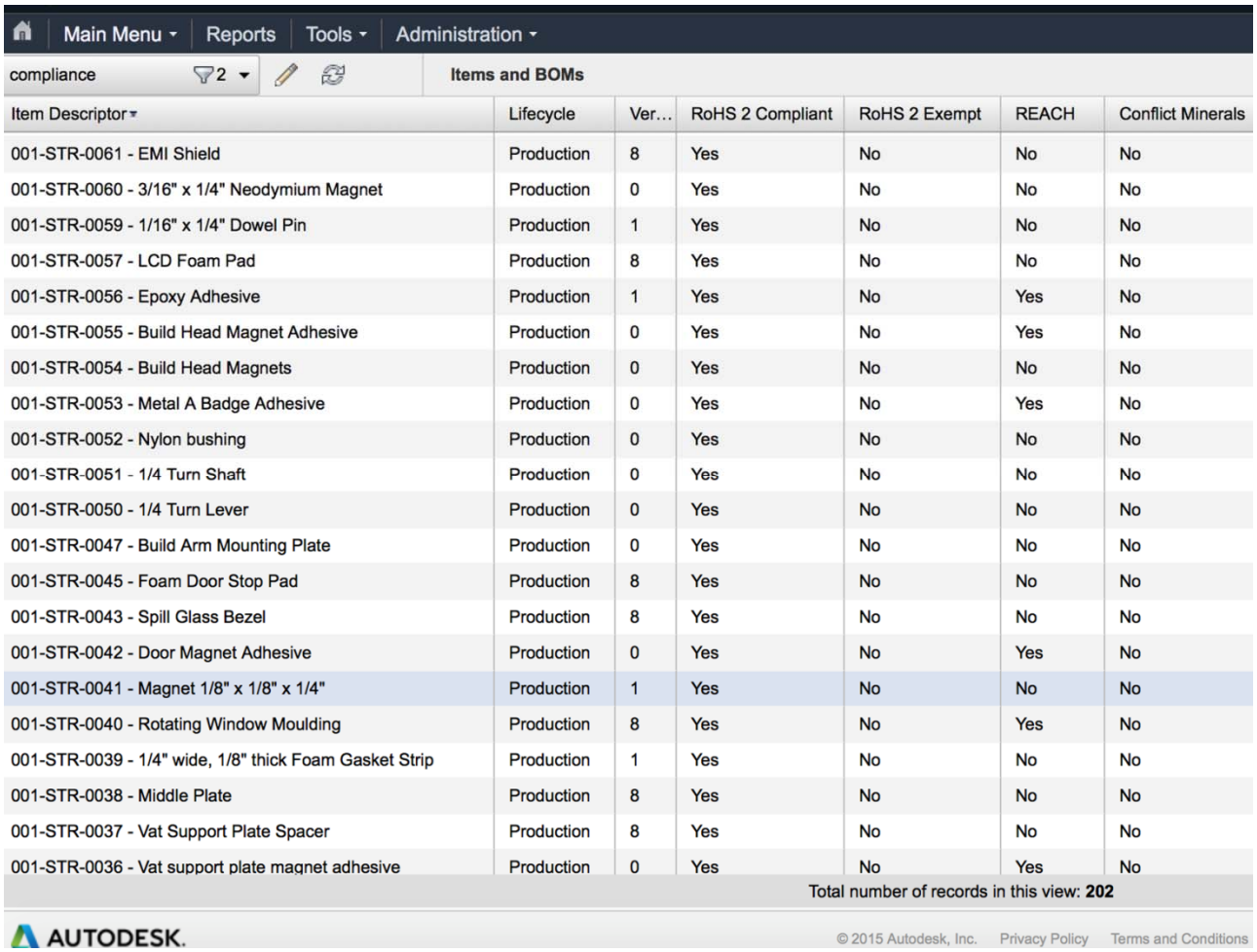
As Autodesk PLM 360 tracks Items and Bill of Materials, other information about the Item is available as it's linked to the Item. An Approved Manufacturers List (AML) on the Item record holds up to five Manufacturer part numbers, and each of these link directly to a Workspace of Suppliers. These Suppliers are more than a simple list - these Supplier records are set out in PLM 360 out-of-the-box to have a Workflow state defining their status as a Supplier.



Compliance Tracking

RoHS, Conflict Mineral

Also part of the Items and Bill of Materials Workspace in PLM 360 is Compliance tracking. From the Bill of Materials tab, a compiled rollup of compliance - RoHS, REACH, Conflict Minerals - can be rolled up, checked, and verified.



Item Descriptor	Lifecycle	Ver…	RoHS 2 Compliant	RoHS 2 Exempt	REACH	Conflict Minerals
001-STR-0061 - EMI Shield	Production	8	Yes	No	No	No
001-STR-0060 - 3/16" x 1/4" Neodymium Magnet	Production	0	Yes	No	No	No
001-STR-0059 - 1/16" x 1/4" Dowel Pin	Production	1	Yes	No	No	No
001-STR-0057 - LCD Foam Pad	Production	8	Yes	No	No	No
001-STR-0056 - Epoxy Adhesive	Production	1	Yes	No	Yes	No
001-STR-0055 - Build Head Magnet Adhesive	Production	0	Yes	No	Yes	No
001-STR-0054 - Build Head Magnets	Production	0	Yes	No	No	No
001-STR-0053 - Metal A Badge Adhesive	Production	0	Yes	No	Yes	No
001-STR-0052 - Nylon bushing	Production	0	Yes	No	No	No
001-STR-0051 - 1/4 Turn Shaft	Production	0	Yes	No	No	No
001-STR-0050 - 1/4 Turn Lever	Production	0	Yes	No	No	No
001-STR-0047 - Build Arm Mounting Plate	Production	0	Yes	No	No	No
001-STR-0045 - Foam Door Stop Pad	Production	8	Yes	No	No	No
001-STR-0043 - Spill Glass Bezel	Production	8	Yes	No	No	No
001-STR-0042 - Door Magnet Adhesive	Production	0	Yes	No	Yes	No
001-STR-0041 - Magnet 1/8" x 1/8" x 1/4"	Production	1	Yes	No	No	No
001-STR-0040 - Rotating Window Moulding	Production	8	Yes	No	Yes	No
001-STR-0039 - 1/4" wide, 1/8" thick Foam Gasket Strip	Production	1	Yes	No	No	No
001-STR-0038 - Middle Plate	Production	8	Yes	No	No	No
001-STR-0037 - Vat Support Plate Spacer	Production	8	Yes	No	No	No
001-STR-0036 - Vat support plate magnet adhesive	Production	0	Yes	No	Yes	No

Total number of records in this view: **202**

For more information on Autodesk Ember: https://ember.autodesk.com/

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