

MFG502574

The Single Source of Truth: Autodesk Fusion 360 Manage Implementation

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ME Global

Learning Objectives

- Learn about unifying multiple sources into a cloud-based implementation.
- Learn how to manage projects, ECOs, Vault, and other resources in one location.
- Learn about connecting all aspects of business in real time on a single platform.
- Learn about multiple options to grow the business, the company, and the employees with 24/7 access to all information in a few clicks.

Description

Cheaper? Faster? Better? Pick two? Why, when you can have all three?! When planning to tie processes and data sources together, there's no better option than using Autodesk Fusion 360 Manage software and Vault Pro software to put them all in one place. This class will showcase the journey of a mid-size company that had the audacity to create a global solution to unite resources and projects in that one instance on a global scale. We'll walk through the steps and missteps along the way, and cover what to look out for on your journey.

Speaker

Michael Best is the Engineering Technical Manager at ME Global in Tempe, Arizona. He is responsible for mechanical design groups, coordinating support for high profile projects, Fusion 360 Manage support/implementations as well as, ensuring design goals and objectives are robust and accomplished accurately globally. Michael has attended AU 13 times out of the last 27 years while also sitting on discussion panels and focus groups as well as presenting 6 classes and assisting in other classes as an aid. He has over 30 years' experience using AutoCAD and its many renditions and has been using Inventor since it was codenamed "Rubicon". Michael can be reached at: mbest@meglobal.com, MikeBest05@comcast.net

Introduction

A little history on PLM as a whole.

PLM was first developed as a manufacturing tool to bring new products to market. The idea was to streamline processes to manufacture products faster

- Reduce costs
- Faster concept to sales
- Manage/improve quality and cost

American Motors (purchased by Chrysler 1987) in 1985 implemented PLM as a way to speed up development of their products. They were able cut development time from 36 months to 18 months for some products, particularly the Jeep Grand Cherokee. Automotive took notice.

Today, when implemented appropriately, it can tie all facets of a company into a forward motion path of success. This is the goal!

Let's face it, trying to tie in multiple processes, plans, people, egos, documents and everything else that it takes to get a project or product done is always a herculean feat no matter the size of any company. The management phrase, "This is how we have always done it!" Doesn't necessarily work in today's fast paced market. You can only make the same widgets so long before someone else starts to make them faster and cheaper....but maybe not better.

Unifying multiple sources into a cloud-based implementation.

“Clouds? Will the cloud bring me free tacos on Taco Tuesday?”

Initial thinking.



New Reality.



“Evolve or Die”, “Embrace the Chaos”, “Adapt, Evolve, Compete or Die”, “Innovate or Fail”, “Keep moving or risk getting Caught”, “Lead, Follow or get out of the way”. All various sayings of the same thing. To stay in business, you need to keep evolving/moving, even in very small increments, to stay ahead in business. ME Global is no different.

We invested in Autodesk Vault Pro over 7 years ago to complement the file storage needed for our projects and Inventor. Soon after we started creating ECO's to submit work with workflows. We discovered it's not really designed for the workflows that we needed. As we continued to work with Vault Pro we identified a need to support multiple complicated processes, we needed a new ECO workflow tool.

Below is the workflow we have in Vault Pro. Seems robust but we seem to paint ourselves into corners sometimes and the Vault Admin is required to keep some ECO's moving.

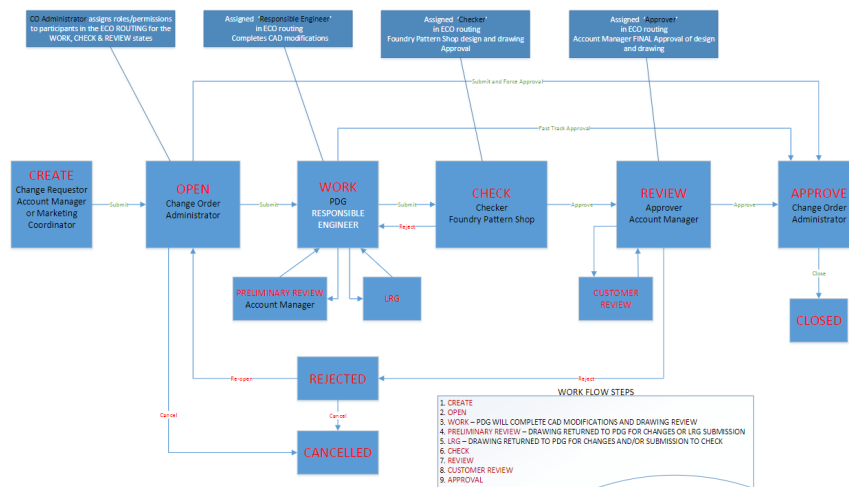


Figure 1 Current Autodesk Vault Workflow

After many meetings and discussions, below was the proposed workflow to build in Fusion 360 Manage.

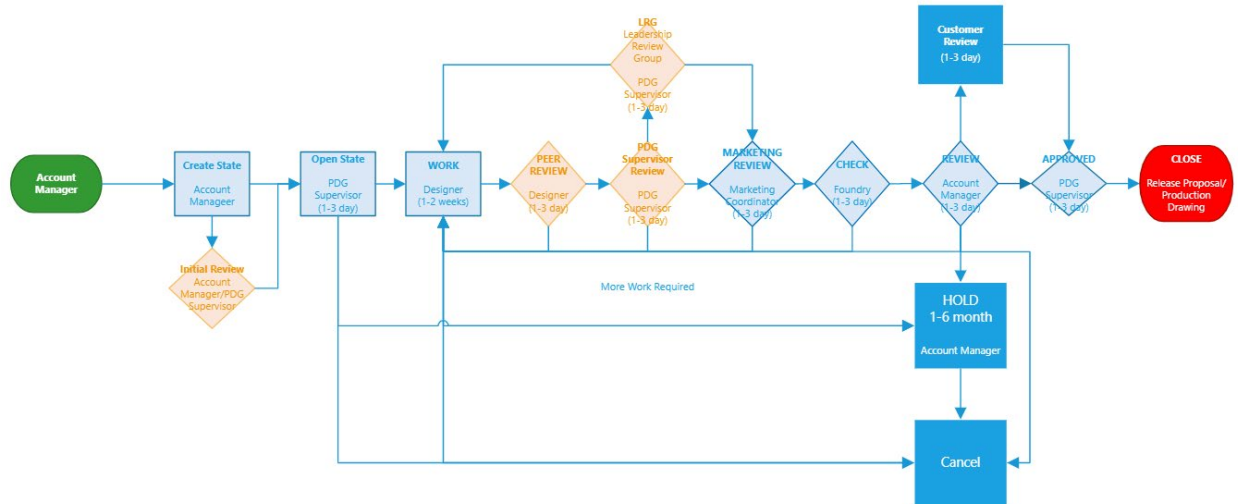


Figure 2 Discovery Workflow after Countless Meetings

Below is the workflow that has gone through many iterations now in place.

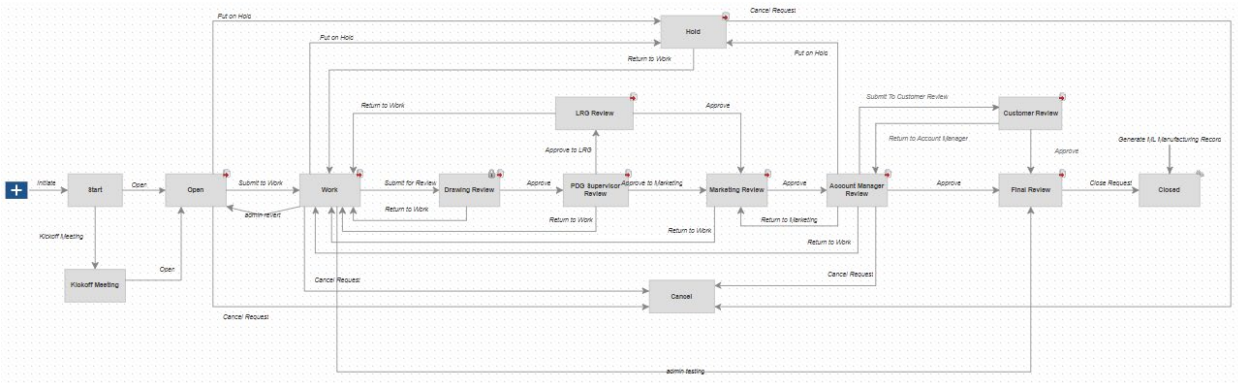
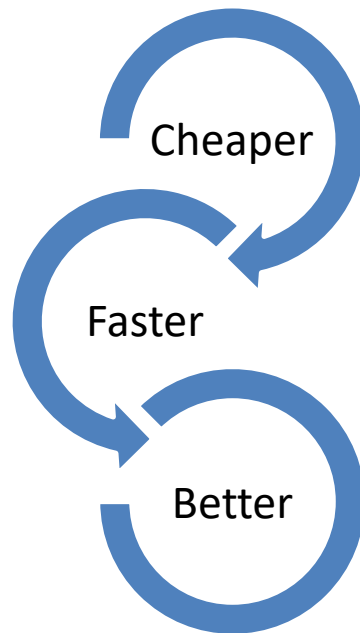


Figure 3 New Fusion 360 Manage Workflow

Cheaper, Faster, Better!?!?



This concept was roughly used by the Air Force “Skunk Works” groups in the late 1940’s to develop jet fighters then NASA tried using it to develop space craft for deep space exploration. It wasn’t excepted very well, as costs and delays are usually the norm.

In today’s world of manufacturing, “Cheaper, Faster, Better, you can only choose 2”, is still very much prevalent.

ME Global’s plan for Fusion 360 Manage and Autodesk Vault Pro will allow us to look at our whole business from start to finish in phases. The goal of this project is to tie every facet of our global business under 1 umbrella to improve our process and successes. Doing so will provide our customers with product:

- Faster – Reduce our overall workflows to improve the engineering to release files sooner to manufacturing.
- Better – Utilize the workflows in Fusion 360 Manage to improve the efficiency of drawing design checking, reviews, and releases. And always keeping the account managers up to date on their projects.
- Cheaper – This can be tricky to define, but when your work product is improved and released to manufacturing, the overhead cost is reduced and can be extended to the customer.

As we increase the number of our workspaces to incorporate additional processes in our company, all 3 aspects will become more visible corporate wide, not just in engineering.

Unification

"You're going to connect this to that! Good luck!"

Unification is hard. People inherently are hoarders when it comes to technology no matter the scale. Notepads, Post-it Notes, Microsoft Notepad, Word, Excel etc.....all used to gather information to track projects, processes, sales and shipping. But what if it could all be connected and located in one place? Or, input into one location for access to all who are part of the project. Blasphemy right?

The first thing we did was begin cleaning up Vault. We knew, like everyone using any vault, there is usually some "debris" hanging out in there, but no one wants to get rid of it (hoarders).

While working on that we evaluated another PLM system but chose Fusion 360 Manage for better integration with Autodesk products, simplicity to manage the workspaces and workflows and the ease of use for a product that could be accessed anywhere in the world with WIFI or cell hotspot.

The next step was finding a connector or integration platform to satisfy all our new and future workspaces to the other software's we also use. Jitterbit is that integration platform. It will be integral to all our processes connecting Fusion 360 Manage as we continue to grow the platform.

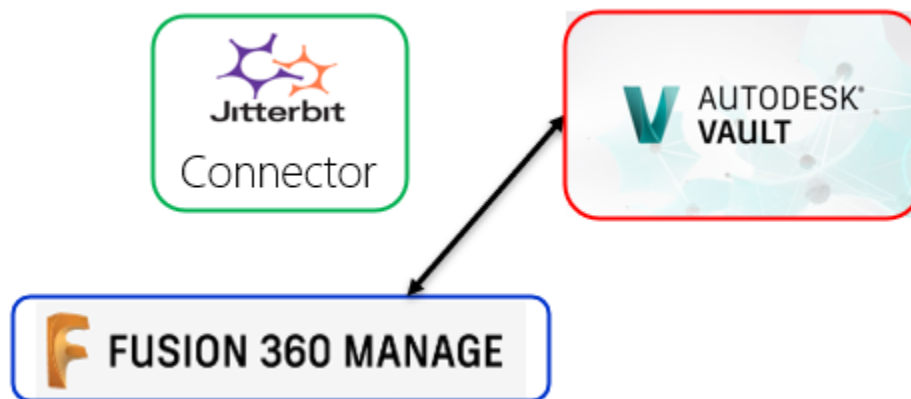


Figure 4 Phase 1 Connections

Learn how to manage projects, ECOs, Vault, and other resources in one location.

“Everything in 1 location? Really? That’ll never work! You’re just asking for trouble.”

Yes, 1 location! One of our main complaints from Account Managers about Vault Pro is there are too many fields or it’s too complicated to navigate.

Tools! We need more tools!

A mechanic needs more tools. In an ever-changing world as in automotive getting more tools is the norm to work on the newer cars each year.

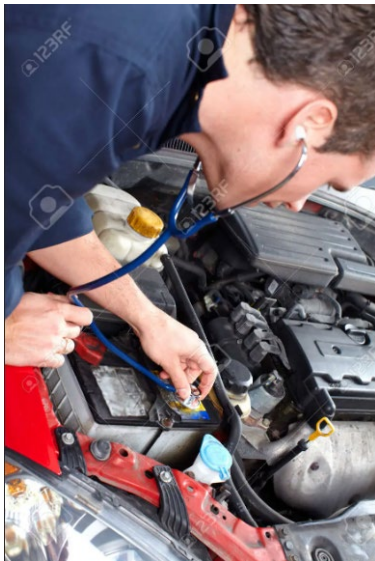


Figure 5 Courtesy of 123RF.com



Figure 6 Courtesy of Snap-On Tools

Like most companies we have tools. Plenty of tools. But do we really need them all when most don't connect to other sources? With Fusion 360 Manage, the idea is to reduce all the noise from so many other tools and place them all in one location for the company to use anywhere.

Our first release of Fusion 360 Manage to the masses. Who dumps so many process improvements all at once? No one with a very sane mind. But, we did provide many meetings on what was coming and a lot of training also was provided and still continuing.

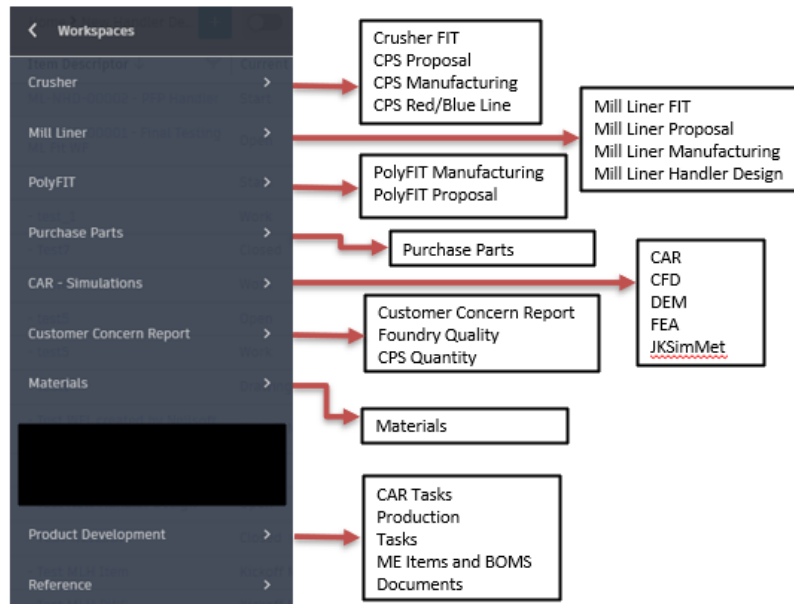


Figure 7 First Release

- 8 Workspaces
 - 21 sub workspaces
- Released incrementally with training
- *Supply Chain and Quality are out of the box installations not used at this time.

Additional workspaces will be released in phases to ease the congestion of information overflow.

The first 3 workspaces and sub workspaces are all connected to Vault Pro. Creating ECO's and connecting files from previous projects (via Vault Pro) for reference or needing adjustments for new projects will all be able to handle through Fusion 360 Manage.

And additional files, pictures, sketches, scans and rough quotes will be located now in the new workspaces. They will "ride" with the ECO's for the rest of their life and referenced as needed in the future.

The main focus of this initial release is to remove the pain and suffering from the account managers having to navigate Vault and adding all the properties in there for ECO's. Those sales guys are delicate sometimes. Fusion 360 Manage should make them feel good about themselves completing tasks much faster with a few property clicks, picklists and a few text entries to start the ball rolling in Engineering to get their project rolling.

Adding the other processes I mentioned earlier will tie more features and functions together in the next few phases for a single source for all information.

ML-DUL-00011 - testing

Start
No workflow actions available

Details
Managed Items (0)
Attachments (0)
Tasks (0)
Associated Workflows (0)

Save
Cancel

Properties (1 of 8)

Record Number
ML-DUL-00011

* Title
testing

* Request Description
test

* Production Facility
Duluth

* Region
US

* Due Date
07/01/2022

Priority Level
1

Customer Information (2 of 8)

* Customer

* Part Description
test

* Product Line
Milling

* Equipment Type
Not Applicable

* Size
Not Applicable

* Alloy Type
302

* BHN
150-180

* Rubber Backing Required
Not Applicable

* Vulcanizing Required
Not Applicable

* Ship Date
06/30/2022

* New Pattern
Not Applicable

* Dual Source Pattern
Not Applicable

* Physical Change to Pattern
Not Applicable

* Pattern Transfer
Not Applicable

Transfer Pat Equip - From
Not Applicable

Transfer Pat Equip - To
Not Applicable

Transfer Pat Equip - Cost
Not Applicable

Figure 8 Fusion 360 Manage Workspace

Simple form for the Account Managers to entry their information for their customer orders. Contains all the data they need to trigger Engineering to start scheduling the new ECO generated from the entries.

In a later implementation Phase, Account managers will enter most of this information in Salesforce. That information entered there will trigger Jitterbit to pass that information and create a new ECU in Fusion 360 Manage. When they are done entering that information, Fusion 360 Manage will open to the new ECO for the Account Manager to review and complete if necessary.

They will also need to promote the workflow to either the “Open” state or “Kickoff Meeting” to discuss changes in the new ECO.

Once the Account manager is satisfied with all the particulars of the ECO and/or “Kickoff Meeting” he can promote it to the “Work” state. Engineering will be notified the ECO is ready to be worked on.

Also, the Account Manager will have the opportunity to:

- Add additional information
- Review the project from start to finish
- Attach site pictures
- Scans
- Notes
- Add additional tasks
- Just to name a few things

Add attachments and documents.

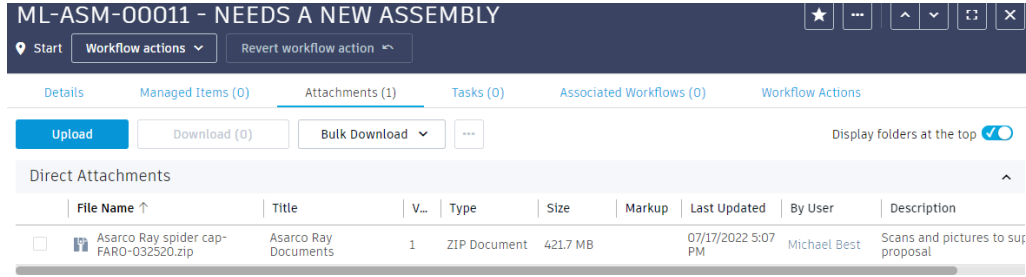


Figure 9 Add Attachments

Create a task for additional work needed.

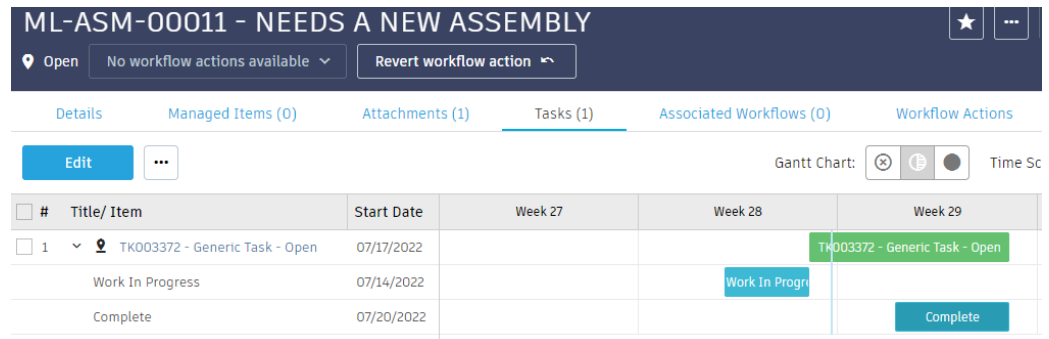


Figure 10 Create Tasks

We also have the option to attach a previous ECO created in Fusion 360 Manage to a new ECO so that previous project information can be utilized.

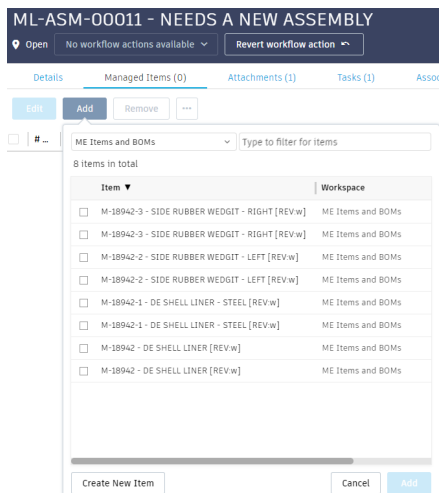


Figure 11 Attach Previous ECO's

Learn about connecting all aspects of business in real time on a single platform.

“So I’ll need to copy and paste everything from one application to another? How does that save time?”

As technology increases, so does the opportunity for more applications to use. Our focus, is to reduce the application and standardize the information we use.

Next, the question was, “What else can we connect or put into Fusion 360 Manage?”



Additional workspaces in the future. These are just a few identified.

- Items and BOM's
- Project management
- Custom KPI charts for all projects
- R & D
- Foundry workspaces
 - Sampling
 - Material
 - Quality
 - Molds/Patterns
 - Reviews
 - Shipping
 - Maintenance
 - Automation projects
- Vendor access for quoting
- Customer access to view anticipated delivery dates

- Standards
- Training Records & Documents
- Time Keeping on projects

These are just a few of what is planned so far. So, no sleep for a while longer.....

Learn about multiple options to grow the business, the company, and the employees with 24/7 access to all information in a few clicks.

“One single source, available to all connected, worldwide.”

- *“Fusion 360 Manage is a product lifecycle management platform that connects your people, processes, and data across departments and geographies. It gives you the flexibility to start today and expand tomorrow with PLM that adapts to your business.”*
Autodesk Website

With Fusion 360 Manage we can overcome boundaries and borders around the world. VPN is sometimes questionable in some areas. Which times out a lot logging into Vault Pro to create an ECO. Being cloud based, Fusion 360 Manage doesn't need VPN. Time zones don't matter when using a cloud based product to ease the pain of entering data to create a project. Everything is done in One Cloud.

As a global company, the cloud will bind us all together to be more efficient and forward moving.

Most companies all have many groups working together, but still maintain their own silo of information. We are no different. With Fusion 360 Manage, all these units/silos have the opportunity to share across the board.

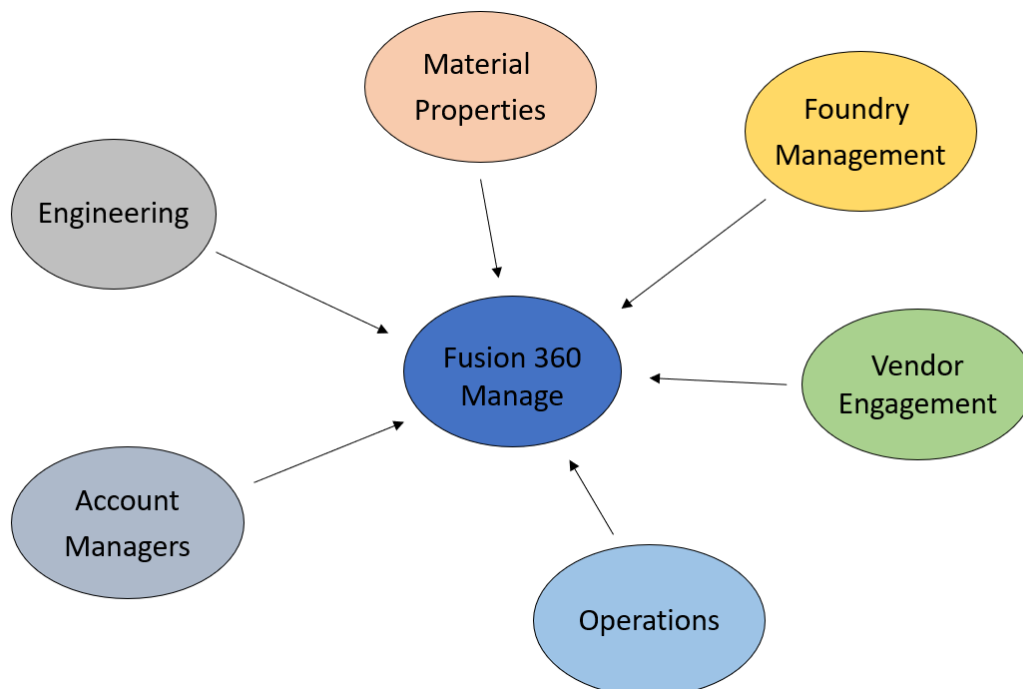


Figure 12, Business Units

Accessibility as a driving factor for using Fusion 360 Manage globally. This was the main appeal for choosing it for ME Global.

- *As of 2022, 69% of the world's population, or 4.9 billion people, actively use the internet. Trends indicate that the number of internet users grows at an annual rate of 4%, meaning that roughly 196 million new people access the internet each year.*

<https://worldpopulationreview.com>

Internet is increasing coverage every year at roughly 4%. Many of the countries we work with have internet and WiFi access. A cloud based product is necessary to connect all the facets of our business globally and instantaneously with a few clicks.

With a laptop and WiFi, connection to Fusion 360 Manage is easy. We can connect from the customers site, hotel or home to place orders or from the car with a cell phone used as a "hotspot"; there is no longer any need to travel back to the office to put the information into Fusion 360 Manage.



All account managers, both domestic and globally, will be able to put in the proposal or actual order right into Fusion 360 Manage. Eventually they will also be able to create their trip report also in Fusion 360 Manage. Thus the record will always be part of the: customers information, a record of current actions being taken and a reference to all work undertaken at the site.

Account Managers

From the customers site, the account managers can pull up previous designs, current designs in process and if they are really daring, check on delivery dates of orders in production and show the customer.

As mentioned before, with WiFi service, cell data, “hot spotting” a cell phone, account managers can access Fusion 360 Manage from anywhere to check or review anything pertaining to their customer in the same room.

At the same time, they can go ahead and place a proposal or actual order into the appropriate workspace and start the order process at that moment. What a beautiful thing!



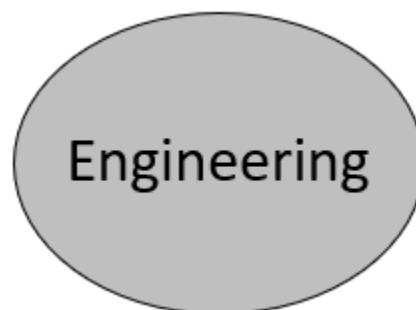
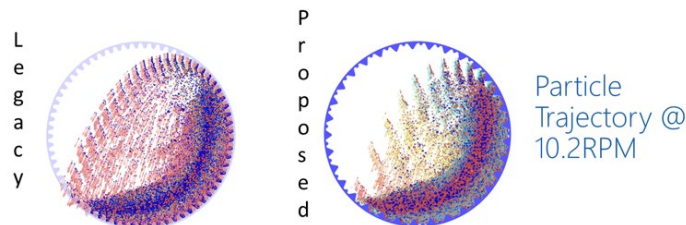
Engineering

When the account managers enter a proposal, design change, new design or a new customers current scanned parts or ideas, engineering will be alerted to the new entry in Fusion 360 Manage. Engineering gets a heads up on preplanning and can begin scheduling work and staffing ahead of time.

This also gives the engineering group a chance to review current designs if there is a change and/or potential design issues based on the equipment the customer has and the change they would like to try.

Engineering can coordinate with the account manager the lead times needed with pattern changes if any or new pattern (mold) if the design change is more extreme than modifying the current pattern.

The simulation group will also be notified if there is a request from the account manager or engineering for simulation to determine if the changes will increase the longevity of the parts. The simulation group is a key feature of engineering. We can estimate the longevity of the replacement parts, based off the equipment the customer has, the speed of the mill and the aggregate running through it at that time.

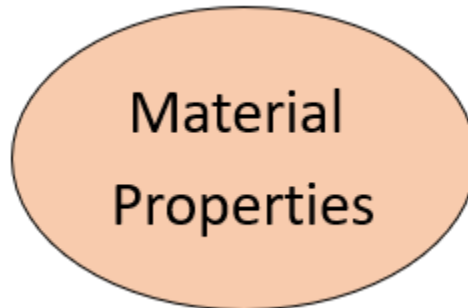


Material Properties

Materials and other various uses are all roughly tracked in the foundry. Metals are weighed when applied to the furnace's for use. Other alloys are added to the mix to ensure the correct formulation is as defined per customer needs.

Different customers need different alloy mixes based on the equipment they have, the process needed to separate the ore from the aggregate processed. The longevity of our products mated with the equipment, aggregate process and the speed of the equipment all depends on the type of alloy that is used. All this together has helped us develop the increased longevity of our product over our competitors. When our customers can continue to run aggregate through the equipment without a lengthy shut down for change overs is more money in their pockets.

Sampling is a huge part of our business. We sample our product at the beginning of a run, the middle and the end to ensure the hardness is consistent throughout the run. If at any time the consistency is out of range, those parts are evaluated and a large percentage are recycled.



Foundry Management

Production schedules are never easy in our business. Some deliveries get pulled forward, other get pushed back per customer requests. Noting and tracking all this movement can be a nightmare. We intend to do better tracking of all these as well as many other areas in the foundry to improve their processes.

Management of material is already done pretty well. But, better management when using new and recycled materials can be enhanced when we know what we have on hand, what's ordered and what's being delivered soon can all be tracked in Fusion 360 Manage.

Pattern shop schedules on upcoming orders as well as repairs can be managed knowing when the account managers input the information into Fusion 360 Manage and the ECO's are created. Automatic scheduling can be created to insure everything will be fully ready for those orders. If new patterns need to be ordered, those RFQ's can be sent through the Vendor workspace and received back so nothing is late in the process. All communications for the project can be processed through the workspaces associated with the original ECO.

Foundry supplies can be handled utilizing the Vendor workspace. Select the vendor, input the supplies needed and away it goes. SAP (when integrated), will updated so PO can be placed. The user ordering supplies will know when the order has been placed and if the vendor gives a delivery date. All will be right in the world!



Vendor Engagement

Engaging vendors is a huge consideration for ME Global. We work with various vendors every day as part of our business.

The opportunity for the account manager to place an RFQ to any of our bolt suppliers for a quote and delivery just cuts down on overhead time. They know the customer's equipment, the type of equipment we place as well as the type of bolts that will need to be supplied with each shipment. With a few clicks from a managed workspace they can put in that RFQ in a few minutes. It's attached to the created ECO as a reference. Accounts payable will be notified from the workspace, when it's created and when the quote comes back. The account manager will also be notified of the quote. It all updates and resides in the ECO.

Some composite products we make require rubber backing. Those companies we network with will be notified to quote the type of rubber, thickness and delivery date needed. All from a workspace in Fusion 360 Manage and the replies will also be stored in the workspace ECO.

ME Global works with a large variety of steel and alloy materials. We utilize a large database to acquire the materials we need for all those blends. Knowing in advance the type of steel or alloy we need, we can use the vendor workspace to either get multiple quotes or deliveries on those materials. That cost can also be associated with the ECO workspace.

Wear parts for equipment and shop supplies are always a necessity in manufacturing. When you can easily put the items you need in a workspace with dropdown boxes and quantities needed, those items can be sent for delivery or for quoting when utilizing multiple sources for those supplies. Everything is tracked from within Fusion 360 Manage and that cost can be placed in SAP (when integrated) for accounts payable to issue the PO.

In our industry we try to buy back our worn-out or competitors' products for reuse. Sometimes we buy recyclables from other sources. With access to our vendor portal, they can let us know when they get the type of recycled materials we need. This will cut down on a lot of searching.....

A light green oval with a thin black border, containing the text 'Vendor Engagement' in a bold, black, sans-serif font.

Vendor
Engagement

Operations

This area encompasses all the previous areas listed above. Utilizing the Fusion 360 Manage dashboard, we intend to set up custom charting of all foundry workflow processes that are part of the workspaces. We will have live, up to the minute of entry for all those processes. This will take some time to set up, but it will be rewarding.

KPI's will also be created and displayed to show work over time. The only true way to track improvements.

And the most important part operations, customer deliveries. We are like most companies, we live or die based on deliveries. A lot of planning goes into the work our customers need to have ready with our products arrive on site. They don't mind when products arrive early. They DO mind when they will be late!



The Source at the Center

Fusion 360 Manage will be crucial to the company growth and streamlining our processes. As the central core of our engineering and operational structure.

The overall goals to realize using Fusion 360 Manage; Decreased Costs, Reduce Waste, Reduce Overhead and Increase Production

Decreasing costs is every company's goal. Better tracking of projects alerts as things flow through manufacturing. Better communication when challenges are encountered during that flow will be better flagged from Fusion 360 Manage via alerts from the system. Every delay impacts overall costs.

Communication is always a must to trying to reduce costs, most of us seem to always be in meetings. Documented communication through Fusion 360 Manage keeps everyone honest and hopefully efficient too.

When decreasing costs, reducing waste work hand in hand. Mistakes happen in every manufacturing company. Mitigating that waste is extremely important. The castings we make can weigh upwards to 11,000 pounds each. To have to throw it back in the furnace is lost income and time.

Post processing mistakes are also considered in waste. Training becomes apparently key in reducing most waste at all companies. ME Global is no different, we are always evaluating processes to reduce our waste with training included when new processes are involved. Time is money and training is an investment in all facets of the company. Any waste reduced due to training provide long term reductions.

Most companies look into reducing overhead as a term of "reduction in workforce." We invest heavily in our employees and that is the last option of choice. Because we will be able to include scans, site pictures, and various other project related data to each ECO created with Fusion 360 Manage, we can reduce the cost of our online data storage sites.

Currently, depending on what part of the world our account managers are in, they will upload data to online sites that are part of our subscription services platforms. Reducing the costs of those by storing the information in each Fusion 360 Manage proposal or manufacturing workflow removes duplication across the board.

Also, we currently have a process in the foundry that requires 4 Excel files, 3 forms filled out by hand and a few pdf's generated we will be reducing all that overhead with 2 connected workspaces, and tablet access on the manufacturing floor. All data will be entered and combined for data output and tracking. Process overhead is reduced to minutes versus hours to put everything together.

And finally, increasing production is every goal. Due to all the topics pointed out, we intend to reduce production time by a few weeks. This goal is from combining all the business units under one umbrella, a single source, Fusion 360 Manage.



Fusion 360
Manage

Single Source of Truth

This project is far from over. We have 4 more phases to integrate in the next 18 months. Not only did we release into the wild a whole set of tools to begin transforming our business, we did it in such a way most companies would shudder at the thought of cutting loose so many workspaces all at once. But the difference is we have held informational meetings to show the benefits and ease of use for all responsible parties and users to lessen the hurt of a new software. Sales guys usually dance to a different beat and will either need hand holding or be retrained again each month. Those results will vary.

By standardizing our processes and integrating them into one location we start removing the silos of business to reduce the burden of unnecessary work that had become the expected norm in those silos.

The “M” for “Manage” in PLM should be changed to “Musketees”; All for One and One for all!

Or to paraphrase “Lord of the Rings” by J.R. Tolkien

***“One Source to rule them all, One Source to find them,
One Source to bring them all, and in the Cloud bind them.....”***