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Gain Business Insights to Improve Decision Making and Lifecycle Efficiency

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Learning Objectives

- Learn how to generate automatic KPIs.
- Learn how to derive real-time reports for KPI analysis.
- Learn how to adjust business process execution to improve KPIs.
- Learn how to perform trend analysis.

Description

Having all process-related information at hand in real time by using a PLM (product lifecycle management) system helps to reveal inefficiencies and bottlenecks in your daily processes. Learn how you can use PLM to determine automatic key performance indicators (KPIs) and reports to assess your company’s success. In the next step, see how these insights can be improved to continuously improve the flow of information and collaboration.

Speaker(s)

Sven helps customers, prospects and partners in achieving excellence of business process execution with cloud based PDM/PLM solutions from Autodesk. He also engages in developing new collaboration solutions using connected cloud services of Forge. Sven is part of Autodesk's technical specialists' team in Germany.

Lee works as Technical Specialist based in the UK (United Kingdom). He helps customer in the UK, Benelux and Nordics understand the value of Autodesk’s PLM solution – Fusion Lifecycle. Lee is extremely interested in learning / teaching integration and connecting to PLM to other Autodesk products and other vendors.

Business Challenges

Studies reveal that companies often struggle with internal business process execution, especially when it comes to New Product Introduction. A summary of Tech-Clarity states that

“80% of New Introductions can fail”
Extending PDM Beyond Design Data Management
Tech-Clarity, Inc. 2019

At the same time, the introduction of new products is key for a companies’ success. If this continually fails, the company will fail to stay competitive and to achieve proper margins in future

One of the reasons of product development failure is the increasing product & process complexity.

This complexity is driven by a couple of reasons, typically:

- Increasing market demands
- Shortened time to market
- Growing product portfolios
- New competitors
- Increasing legal requirements
- New challenges like the sustainability of products.

Systems at our customers usually are not able to deal which this new level of complexity. Employees have to make use of multiple data sources to get the total picture and spend a lot of time to manage collaboration and related processes. Delays occur because data is not available or is lacking required quality. Lack of transparency and control prevents decisions to be made in time. Finally, this complexity also impacts business processes to meet the increasing need of efficient collaboration.

If you want to learn more about these challenges, please see the online seminar “Bringing New Products to Market Faster with PLM” of **Brian Schanen** which is also available as recording: https://www.autodesk.com/campaigns/vault-plm/webinar-series/npi/on-demand

Root Causes

To get these issues resolved, companies must effectively manage collaboration along the whole product lifecycle - from end to end. Starting in Sales & Marketing, all the way down to Services. Because all errors and delays sum up over time and finally impact manufacturing and the product delivery in the end badly.

In most companies, collaboration within the departments is already quite efficient. They use dedicated data management systems to address their specific needs:

- Sales uses CRM (Customer Relationship Management system)
- Engineering uses Product Data Management (like Vault)
- Production uses Enterprise Resource Planning
- Production may be using a Manufacturing Execution System
- Typically, Service departments do not have a dedicated data management

However, these departments usually only worry about their internal collaboration and less about the collaboration with other departments. And there are a lot of key business processes that involve these departments all together:

1. New Product Introduction / Development (NPI / NPD)

When introducing New Products, Sales & Marketing continuously share requirements with Engineering to be implemented. In the next step, Engineering must share product data early on with Purchasing for ordering long lead time items in time. Finally, the product must match manufacturing tools and processes. Just to mention few of the exchanges across the departments.

2. Quality Management / Non-Conformances

When Non-Conformances are identified during Quality Inspections within manufacturing, this information must be passed to Engineering. Engineering then may have to update the design and again inform purchasing if this has an impact on the supply chain

3. Requests for Quote

In Project based business, sales have to interact with Engineering and Manufacturing to respond to Requests for Quote in time. Usually this is not a onetime process as usually there are frequent updates coming in.

4. Product Maintenance

Services Engineers require to have product, production & maintenance data at hand when being at customer site. They must also be able to share recurring product issues with product management & engineering to kick off a change

Typically, these processes are not effectively managed. Related collaboration & information is not managed in any of the existing systems. So employees make use of standard tools they have at hand instead. E-Mails, Excel-Files, PDFs and other office tools enable to quickly capture, share & request data. But while this is convenient for the initial creator of data, the usage of these tools in global teams causes a lot of problems in collaboration:

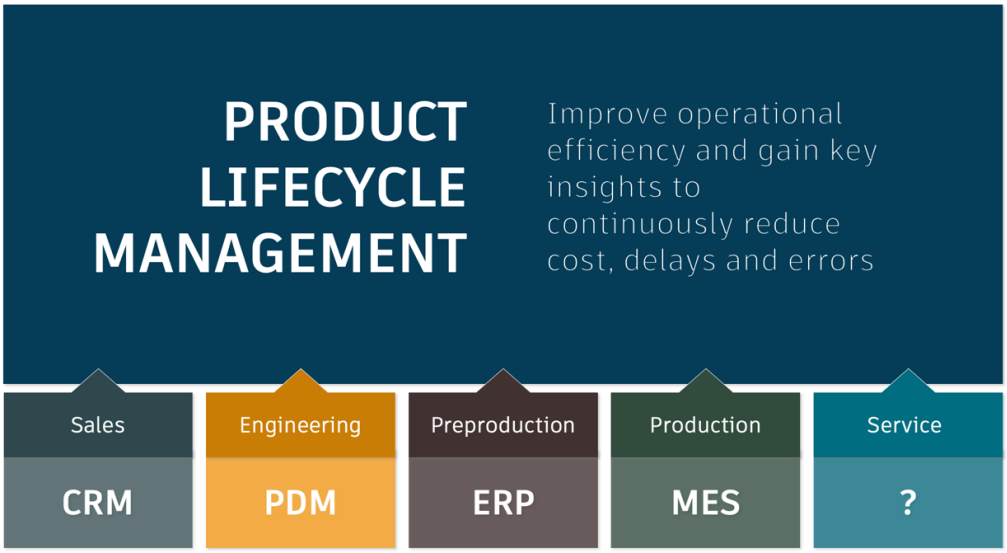
- How to find data?
- How to know that data exists?
- How to link data?
- How to trace changes?
- How to collect data for audits?
- How to communicate and recognize the maturity of data?
- How to recognize the process which the documents belong to?
- How to control access?

Common Collaboration Platform

PLM as a common platform streamlines data, processes, and collaboration. It is a unique platform that covers the whole product lifecycle process. It is not designed to be used by Engineering OR Manufacturing. It is designed to be used by anyone being part of the product lifecycle. This also includes external stakeholders like suppliers and engineering offices.

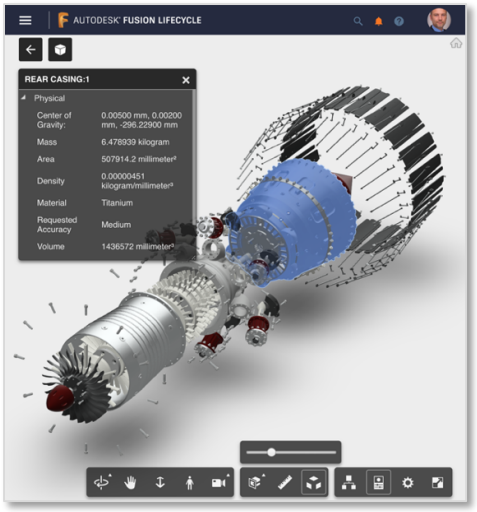
It addresses the lack of collaboration, removes the burden of manual information sharing, removes delays in business processes and finally removes the cost of human errors.

PLM does not intend to replace the existing systems but integrates to them to promote reuse and ensure their data is the latest.



PLM offers features that focus on efficient collaboration as listed below. All of these features are directly provided by Autodesk's Fusion Lifecycle solution.

Smart Online Data



PLM aligns all data to provide a 'single source of truth'. With PLM, users do no longer use a network drive or e-Mails to share information. Instead, they have an online environment at hand to manage data together in real time and in a smart manner: Each dataset will provide features to manage its use by multiple stakeholders concurrently and securely:

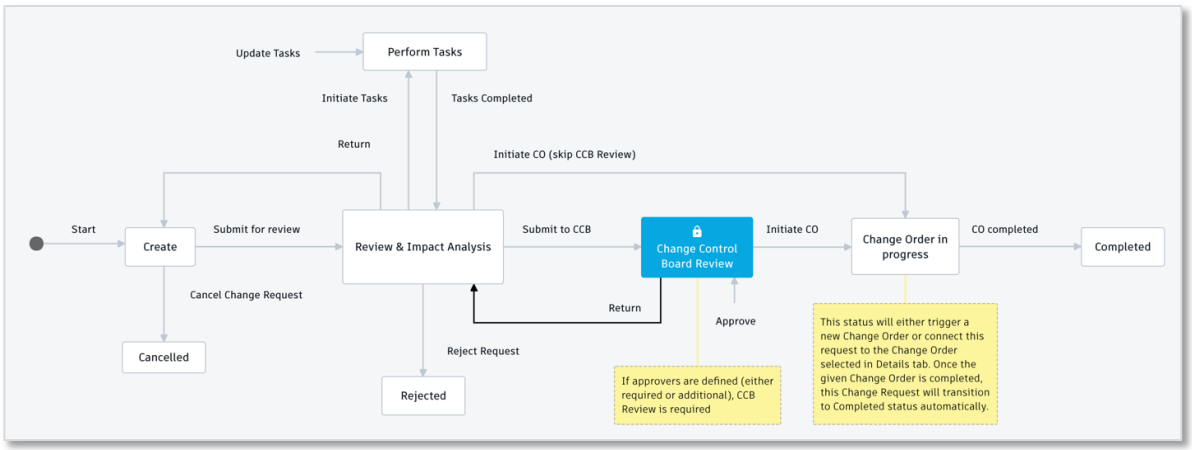
- Configurable data sheets
- Automatic numbering
- Content & process validations
- Filtering & personalized views
- Access permission control.

Once available in PLM, all data can be linked to other records. Such references will always follow even if referenced data gets changed.

Most importantly, this environment deals properly with product data. Bill of Materials information, item master data, item attachments, item revisions and item references are all available within PLM. Files also can be attached to the records, too. Users also benefit from the embedded viewer being able to visualize any CAD file without upfront conversion.

Workflows to guide & track

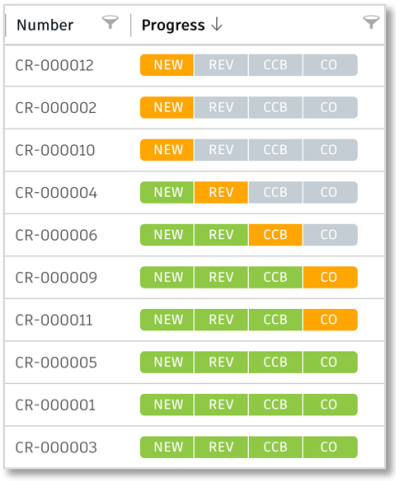
Data in PLM is attached to and controlled by graphical workflows. The graphics show the flow of information and are also used to interact with the processes. For example, users can click on a transition between two states to perform the given transition.



The workflows describe the steps of a process, the possible transitions as well as permissions to determine the responsible users. End users do not need to know any longer about the process itself, PLM will handle it automatically

For Example: When a Change Request gets created, the solution knows about the required next steps. It also knows about the responsible users and notifies them automatically by mail about the new request. The Change Request will also be listed in the addressees' online to-do list in PLM.

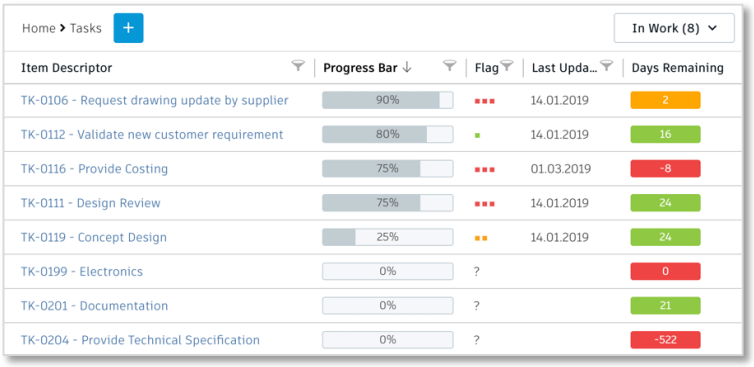
As users perform the given actions in the process, the graphic will update and always highlight the current status in blue. This makes it extremely easy to understand the progress of a workflow. In addition, graphic progress indicators also help to review the progress of multiple processes running in parallel.



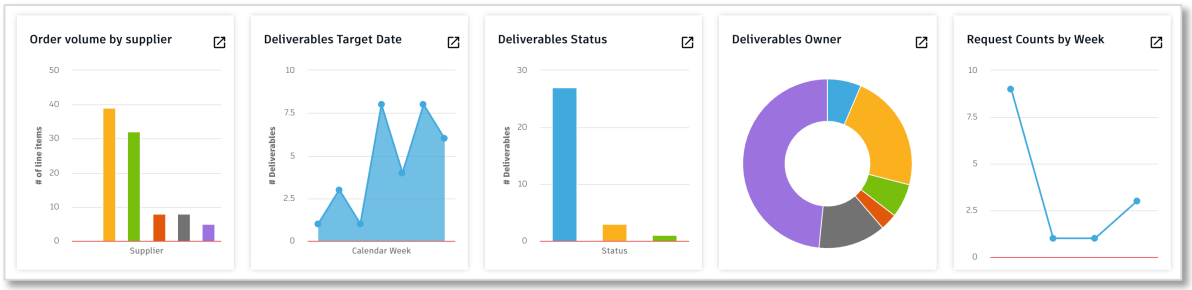
Real Time Status

Users always have real time status information at hand in PLM by using reports and charts.

Reports can be used to filter relevant data like my pending tasks, all overdue tasks, or Change Order processes in work.



Charts can also be generated. They help to immediately reveal KPIs (Key Performance Indicators) that help in decision making. Such charts help to recognize trends and bottlenecks in business process execution when analyzing data of a longer timeframe.



Closed Loop Process Management

When PLM is established, it can be used to manage any kind of business process, with the primary focus on business processes not being managed by a system at all yet. To enable a quick time to value and immediate project success, Autodesk Fusion Lifecycle provides pre-configured business processes.

Standard Business Process Solution

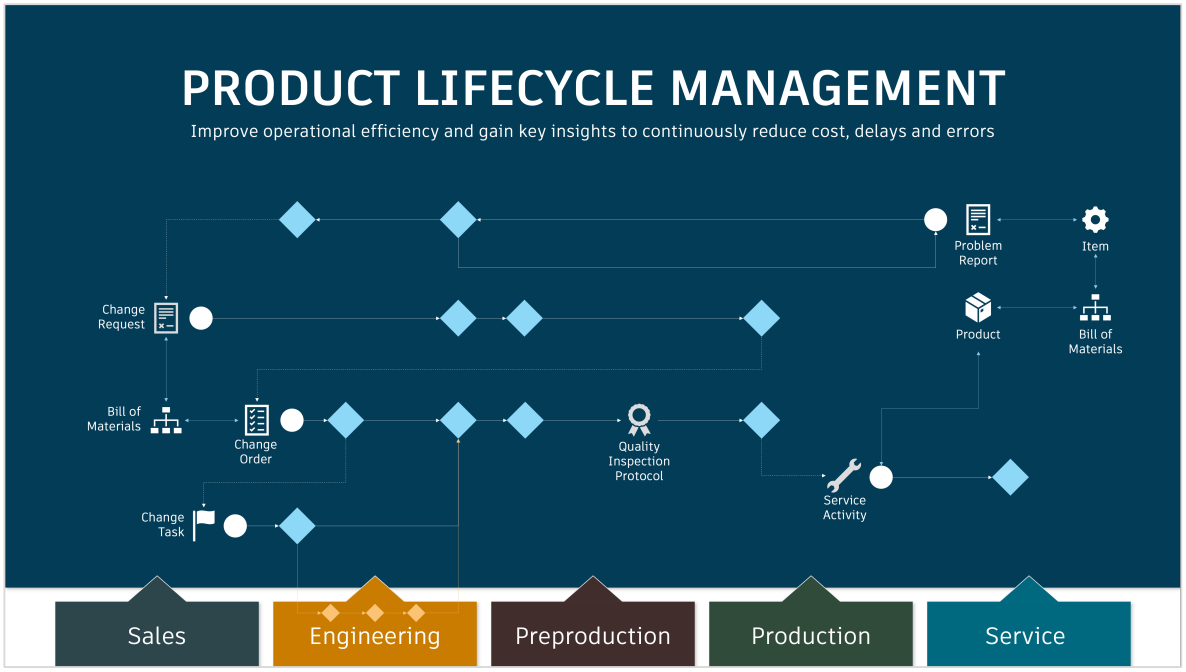
There are a couple of business process solutions that are ready-to-use in PLM. All of them improve given processes by the means mentioned before. This includes

- New Product Introduction to manage all activities from idea to product
- Enterprise BOM management to build the full spec of a product for manufacturing
- Change Management manages root causes of changes and the change implementation
- Quality management to plan and validate quality standards
- Supplier Collaboration to include the supply chain in business processes

All these modules integrate to each other to provide a closed loop information & process data management solution.

Change Management Processes

The standard Change Management solution provides a closed loop management of business processes to enable smooth collaboration across various departments being involved:



PLM will be the single platform to manage the series of events:

- Service Engineers can document problems with a failing part directly while being onsite using their tablets. Whilst doing so, they will have access to relevant information in PLM: Product master data, Product BOM, item master details etc.
- After saving the related “Problem Report”, PLM will initiate the corresponding workflow and identify the given responsible Product Manager. The Product Manager will then be informed by PLM about the new problem report immediately.
- The Product Manager may have a question for the service engineer and send it back by using the workflow or forward the report to head of engineering to propose a change.
- Head of engineering now will be notified by mail – just a few minutes after the report got created. After reviewing and assessing the Problem Report, they may decide to initiate a Change Request.
- Right after selecting the given option within the report, the system will trigger the given Change Request process flow and connect it to the originating Problem Report.

- This Change Request now will request defined stakeholders to assess the impact of the given request, to validate alternate options and to select the components to be changed. The Change Request will also involve purchasing and manufacturing to inform them about the change coming up and to ask for their approval
- If they all approve, a Change Order process will be launched automatically to take care of performing the change
- Implementation of the change is managed by Change Tasks which can be defined, assigned, scheduled, and tracked directly from the Change Order. Once all tasks are finished, the Change Order process will continue.
- In case of Engineering activities, this may also trigger an engineering change order in Vault
- Once the change has been implemented, the Change Order will again request approval by stakeholders in purchasing & production before releasing the change
- If needed, the Change Order process may also trigger quality management processes as part of or after the approval of the change
- Finally, service activities can be scheduled as a follow up to get the faulty components replaced with the updated design.

Such processes can be used in PLM immediately and be adjusted to meet customer's needs. Customers may want to add certain steps or even remove steps – they can decide on their own about the complexity required.

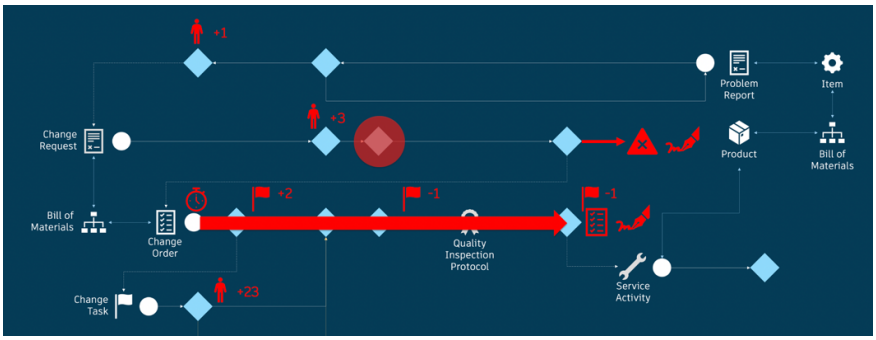
By managing the processes in PLM, companies can eliminate documents and manual information sharing. PLM will automatically trigger follow-up processes and involve the correct stakeholders. It will further more move information along the processes for full traceability: Users managing the Change Order will find the originating Problem Report attached. PLM does not forget anything.

Automatic KPIs

With PLM, processes are defined and executed online. This not only provides automated collaboration, but also automatically captures relevant information. The solution will for example keep track of all changes performed to records in the system and store information about the creator and the creation date of processes. In addition, the system also keeps track about all interactions within the processes (e.g. when an approval is done, or a task is set to complete).

KPIs may also be based on inputs provided by the user: The type of change, the actual cost of changes, the total efforts of tasks and the name of the supplier related to a change order eill help generate KPIs. Depending on the company's business problem to solve different type of information may be of interest. Using PLM's flexibility, the solution can be adjusted accordingly to gain the given information.

This can also include automatic computations. For example, one can let the system calculate the duration of processes by simply determining the difference of start date and end date of a business process.
Customers can use the built-in calculations of standard apps and in addition configure custom calculations when needed.



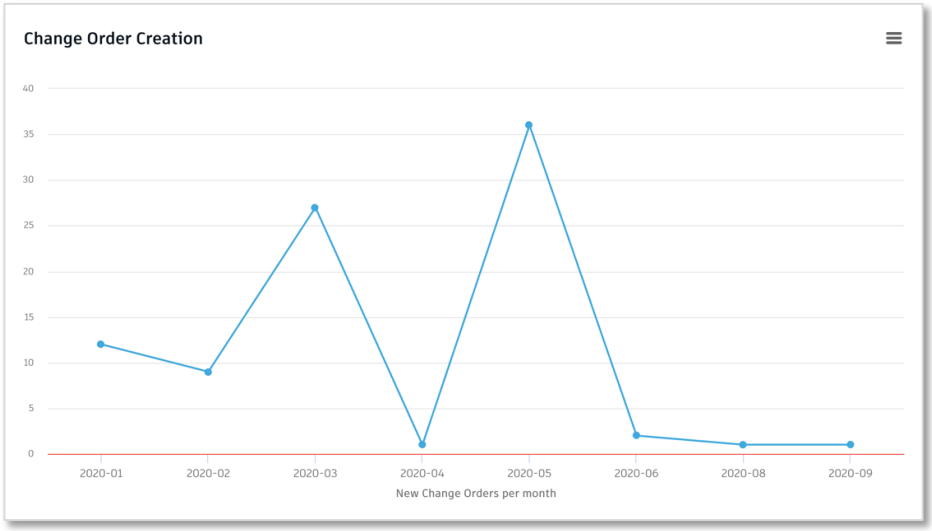
Overall, various key performance indicators can be retrieved when managing business processes online:

- Real time status & progress information as well as workflow history
- Start & End Dates of steps in the business processes
- Duration of given steps in the business processes as well as their total duration
- If milestones are set for the steps of business processes, deviations will be determined based on actual dates. Red and green color indicators are used to highlight delay
- Efforts can be tracked on any business process step and totals can be calculated on various levels (team, month, year, …)
- User decisions like approval or rejection is tracked

Using the real time reports, users can compare these KPIs across multiple business processes to reveal trends over time or to compare performance of current processes against statistical data for example

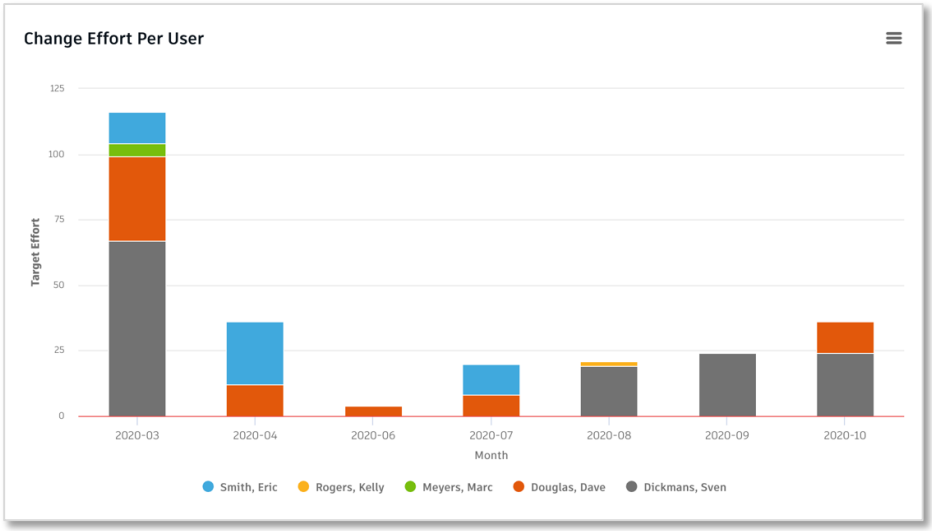
Standard KPIs

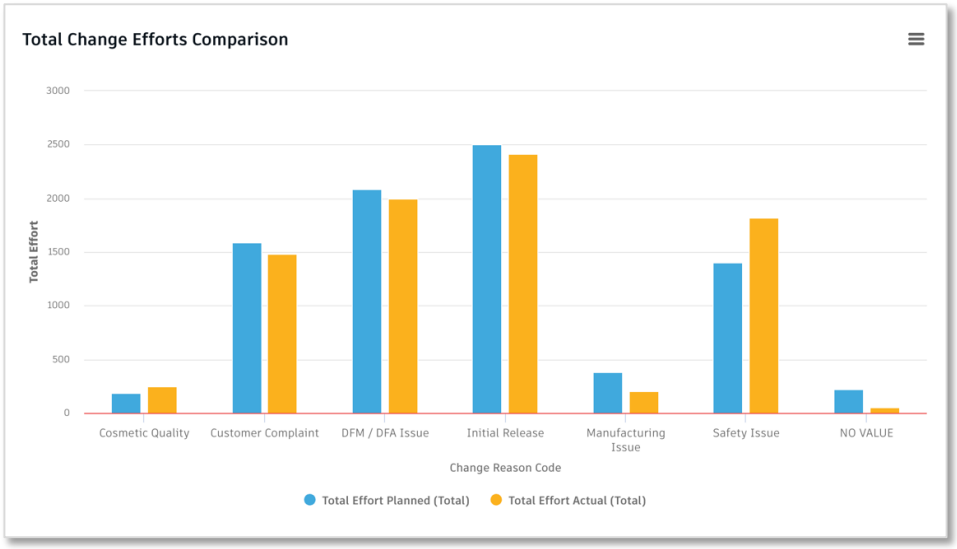
Using the data of standard business process templates, a couple of valuable KPIs can be generated immediately. Additional reports can be created at any time by privileged users in PLM. The following examples are based on the Change Management solution and show the level of information being available thanks to online processes in PLM:



Reveals the number of Change Orders that have been created in the past months

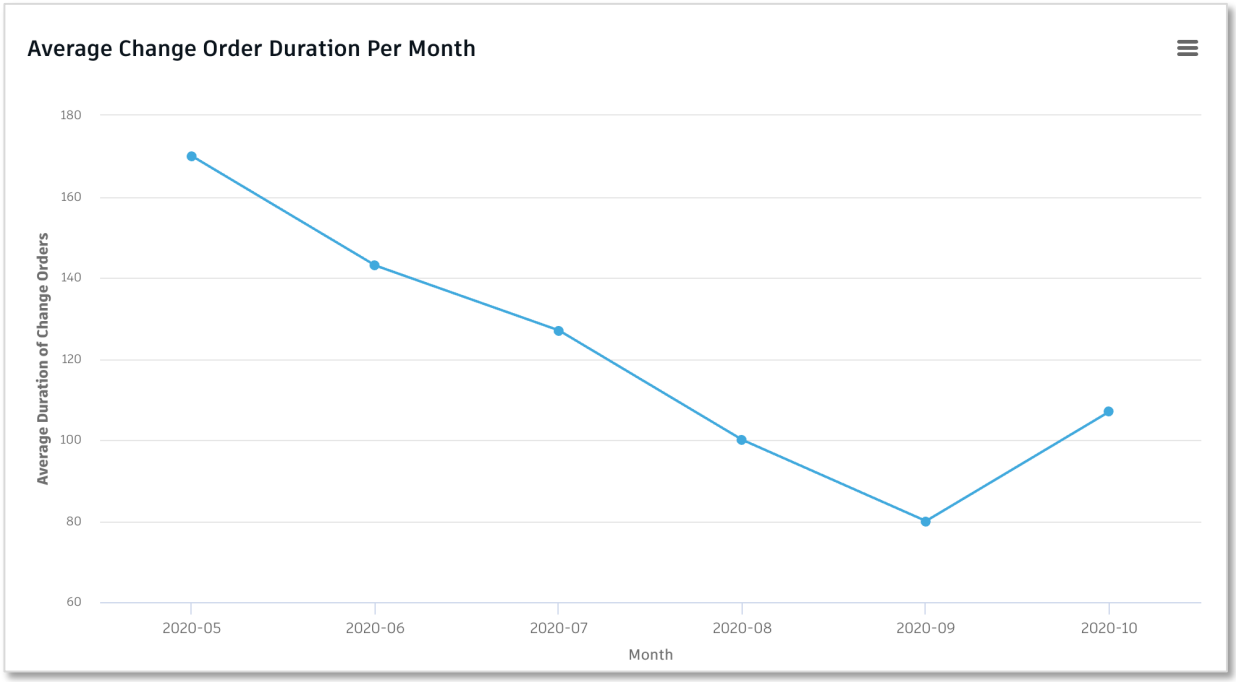
If efforts get tracked on Change Task level, PLM can determine the effort being spent on changes by the team.





Based on the same data, target & actual efforts can be compared along with the efforts being required to react on various change reasons.

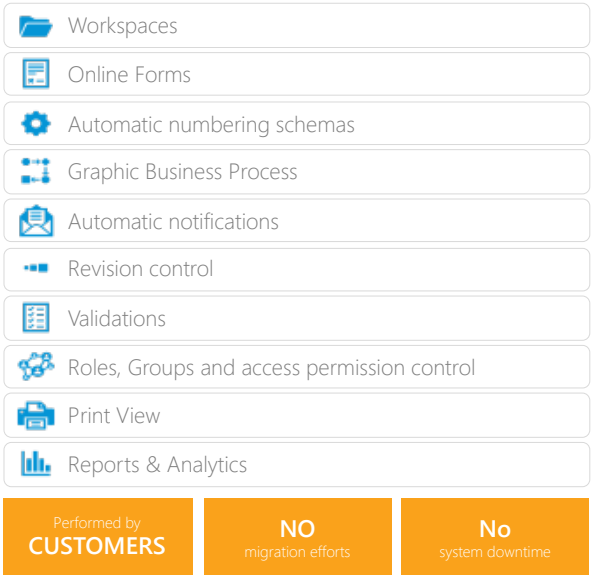
Based on the start and end dates of Change Orders, the system can determine the average duration of Change Orders per month:



Improvements & Flexibility

One key strength of Autodesk's Fusion Lifecycle is its flexibility. The KPIs generated from PLM or other sources can be used to continuously extend and improve the PLM system, to further adjust it to the current needs. These changes can be done on the fly by the customer himself and do not cause any migration efforts due to later software updates.

When having administrative access to a Fusion Lifecycle tenant, users, can make use of the administration tools shown to the right to adjust the behavior of PLM.



These administration tools enable to perform configuration changes with ease on the fly without system downtime. Such changes can be used to react on the KPIs generated by the system as described by the following examples.

Improve data Quality

Validations can be enabled for the forms in PLM, enabling to make fields required. This can help to improve quality of data being provided.

See example video here: https://www.youtube.com/watch?v=f5M53iGcl88

Enrich Data

If additional details are required for reporting or decision making in business processes, new fields can be added to the forms in PLM. Again, these fields can be set to be mandatory.

See example video here: https://www.youtube.com/watch?v=lX8IAmyfTfs

Adjust Standards

Change Orders are driven by Change Templates defining required actions to be performed

Over time customers may figure out that they perform the same changes to this template in most of their Changer Orders. So they may want to adjust the Change Templates. This can be achieved by privileged users easily from the list of Change Approval Templates.

See example video here: https://www.youtube.com/watch?v=YQ8VAvj47ZY

Reduce Complexity

In order to start small and drive user accpetance, customers also can reduce complexity of standard business process in PLM by hiding certain steps. By simply hiding steps, customers can unhide the steps quickly later on.

See configuration example here: https://www.youtube.com/watch?v=MvZ_bq9wAEs

Prevent Delays

If users forget about crucial steps in business processes, PLM may remind these users of their responsibility automatically. This is enabled easily in the Workflow Editor being accessible to Administrators.

See configuration example her: https://www.youtube.com/watch?v=LwR5jpoOobY

Handle Exceptions

In case automatic reminders are not sufficient, automatic escalations can be enabled for given steps of buinesses processes.

As an example, one could extend the change order business process with a new workflow step named Escalation which will be set if the Change Control Board review does not complete within a defined timeframe.

See configuration example here: https://www.youtube.com/watch?v=VkncfhZ6SnM

Conclusion

PLM provides added value compared to existing solutions in place already:

- **OneDrive and even Microsoft Teams** are great in sharing files easily. But both fail to manage process information and meta data for files, making it hard to find relevant information and to stay up to date
- **Business Intelligence** tools can create nice and valuable reports. But as soon as you want to take an action based on your findings, you will have to switch the tool. With PLM, you have reports built in directly with data sync. PLM cannot replace an existing BI solution but will reduce its usage for sure.
- **ERP** is lacking flexibility required for product creation processes. Also, it is transaction based instead of process based
- **PDM** addresses the Engineer's needs perfectly well. But its file based approach and expert level UI limit its use outside of Engineering. HOwever, PLM cannot replace a PDM system as it lacks CAD integration and CAD file management focus
- **Project Management** usually is disconnected from data management and lacks given references between these worlds. Additionally, it is task based and not workflow based.

Given its flexibility and focus on product data, PLM provides unique benefits for all stakeholders:

1. Product Lifecycle related processes can be standardized
2. All stakeholders gain unmatched insighs in business processes
3. Staus & Efficiency can be tracked in real time
4. Based on experience of previous processes, the system can continuously improve at anytime