O3 SOLUTIONS
Turn ON the Power of O3

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DATA WARS

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Discover how O3 is leading the industry in Data Management

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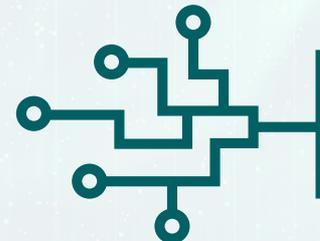▶RS:/011

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The Value of Data
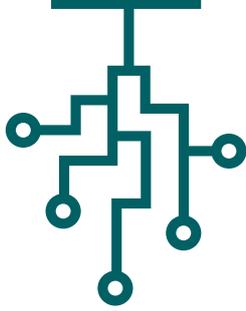
Consolidating your Advanced Work Packaging (AWP) data into a single software solution is critical to AWP success. Below are some examples of how O3 has helped eliminate AWP data challenges:

- When data is managed in multiple sources, software licensing restrictions prevent people from having access to all the information that they need.
- When data is all visible in one platform, it is automatically compared across ALL sources making any inaccuracies or inconsistencies obvious and simple to address.
- Consolidating all constraint related data into a single system is the only way to ensure that you can release constraint-free work packages to the field.

RESTful API

Web Hooks

Flat File Imports
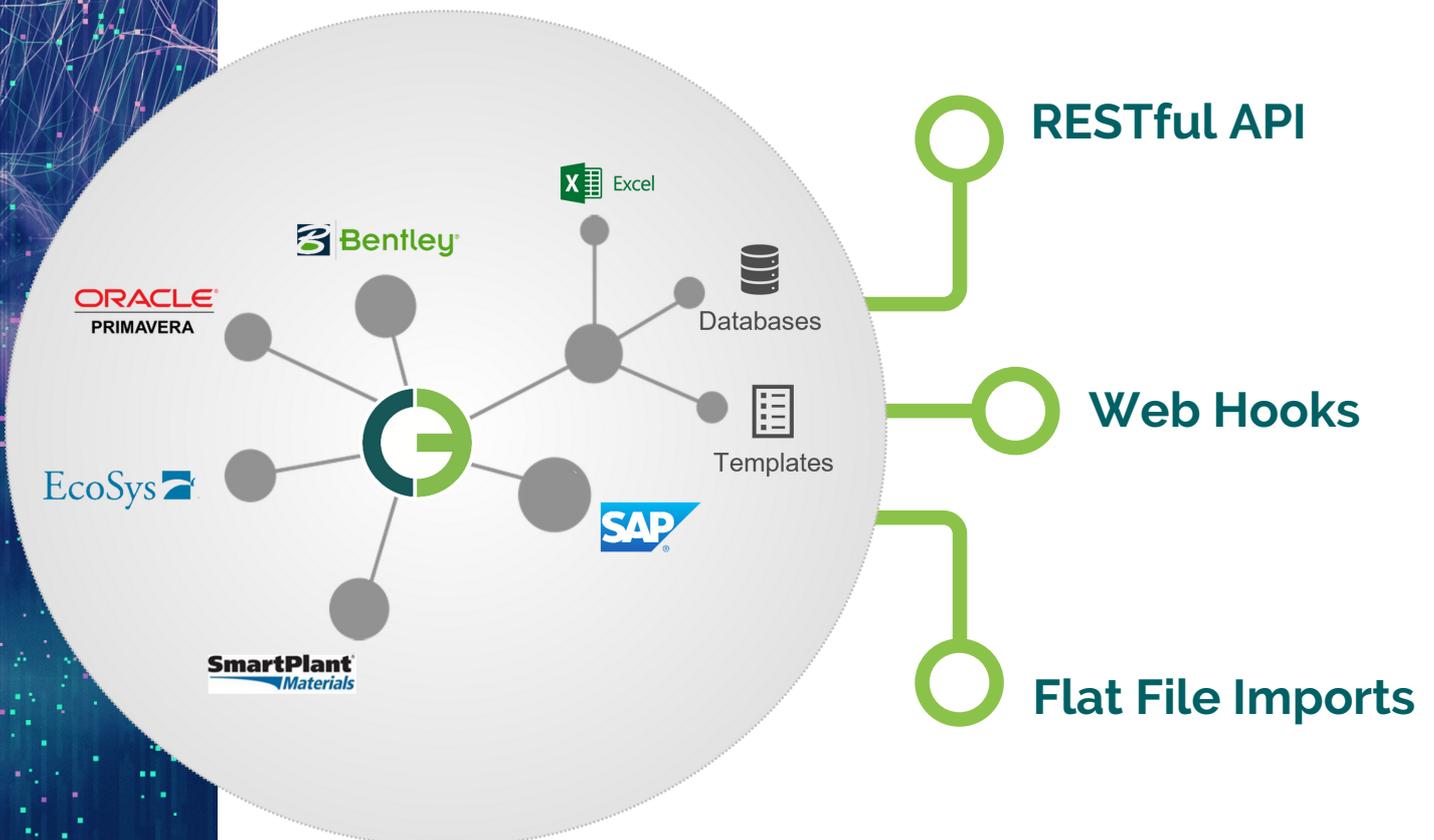
Who Benefits from Data Management?

Owners/Executives

Consumers of reports no longer need to track down relevant information. It is available to them in an easy-to-consume visual format anytime and from anywhere.

Engineers

Progress on Engineering Work Packages and engineering owned constraints such as drawings is automatically available for construction without engineers having to change their process.

Workface Planners

Proper attribution of the Virtual Construction Model drives automation, making Installation Work Package creation five times faster than the manual, non-graphical approach.

Constraint management automation through data integration transforms the role of the Workface Planner from a reactive chaser of information to a proactive planner.

Everyone Else

With unlimited users, anyone can be added to O3 to view the data you want them to see, eliminating licensing restriction issues of other project tools.

Consolidated views of the entire project data set lead to a reduction in miscommunications and an increase in collaboration.
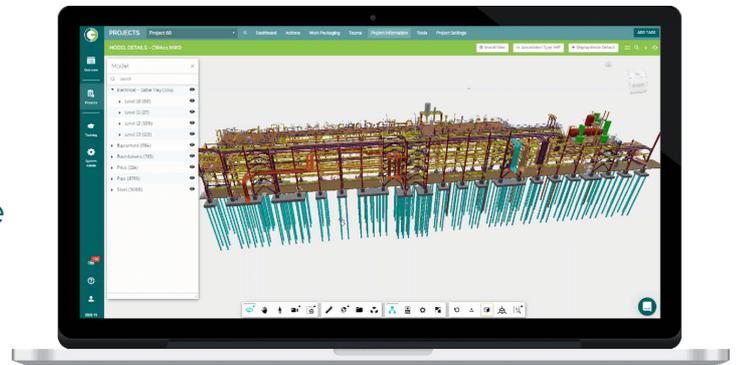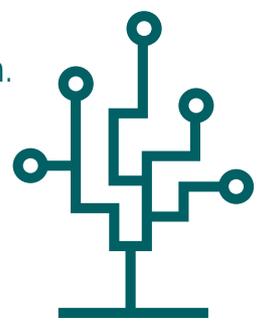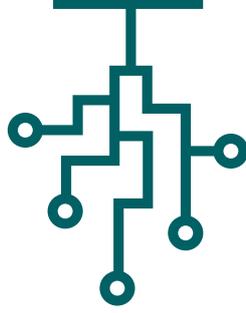
O3 & Data Management

O3 is a software platform designed to consume and manage data from existing project systems including: engineering, document management, procurement, materials management, scheduling, and more. O3's data management tools make it easy to know what data is required and whether that data is being received in a timely and complete manner.

O3's ONBuild Solution
is the first comprehensive workface planning software solution that allows you to create, track, and manage work packages. ONBuild combines sophisticated graphical and non-graphical work packaging with true constraint management, reporting, and analysis to identify and resolve problems in real-time.

Benefits of Using AWP Software to Manage Data
ONBuild is a single solution that automates manual AWP processes to make your projects more efficient thanks to real-time access to data.
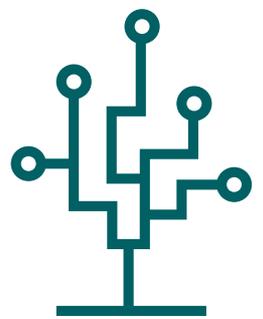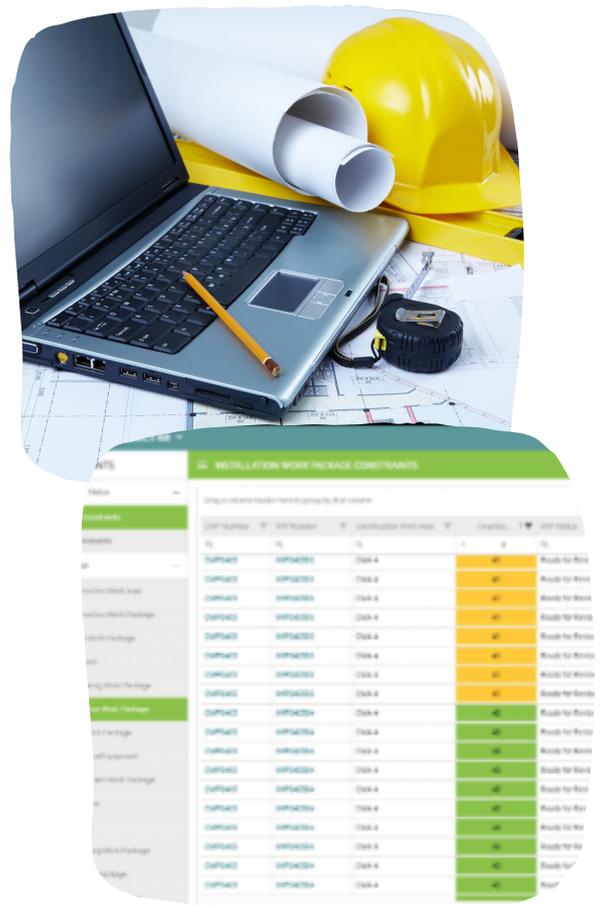
Creating an AWP Data Strategy

O3 projects implement work packaging in the field and depend on good quality software to manage their process – which relies of course on good quality data. O3 helps project teams define the data requirements needed to support a healthy Advanced Work Packaging program and leverages this well-organized data to enable automation of the work packaging process and ultimately drive users to efficient execution.

The Process

- Get data in the correct format from the beginning. Set requirements for data delivery in project contracts.

- Use templates and an attribute table to make it easy.

- Over, Shorts, and Damage - deliver data to a common portal, screened, and accepted or rejected.

- Store the data in a centralized repository, sorted by key attributes, by tag number, and by Construction Work Package.

- Use a common cloud platform that can be managed and securely accessed.

- Use a data management software such as O3 to act as a "truth serum" to show the gaps in missing or inaccurate data.

- Create meaningful reports with your data from a single source in real-time.

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Creating an AWP Data Strategy

"Begin with the End in Mind"

Our advice (similar to the process of AWP) is, to begin with, the end in mind – and implement a "Crawl, Walk, Run" plan for your data strategy. Start off with imports of the data using the existing format to understand the data you already have.
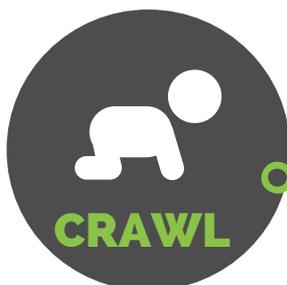
Then set expectations for exchange – fields, format,and frequency. Establish reporting to track the data health and accuracy, and then move to semi-automated and API level integrations as your comfort level increases.

Having RESTFul APIs and webhooks allows administrators to interface and connect more easily during the "Run" phase.

O3 has the experience and battle scars to give you recommendations and guidance along your journey. We've seen it all as we've worked with our global clients and different project sizes and types.

O3's Real-world Experience

Example: O3 discovered some international companies use semicolons to separate data instead of commas in CSV files. O3 was easily configured to support this particular use case, as well as commas, colons, and any other separators. If you've got the data, we can meet you where you are!

CRAWL

Imports using existing formats

WALK

Set expectations for exchange & reporting

RUN

Expand to integrations

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Managing Data to Enhance AWP

AWP data management often focuses on the Virtual Construction Model (VCM) as this is an area where many software solutions struggle to load and manage all the data necessary to fully attribute the model. While it is important to get your 3D model data correct in your construction automation tool, it is equally as important to correctly manage the rest of your AWP data as well. AWP data extends well beyond the VCM into managing non-graphical workface planning data and constraint data.

Data Inputs
- ✓ 3D Model
- ✓ Spool & Isometrics Drawings
- ✓ Pipe Fabrication PCF
- ✓ Steel Fabrication IFC
- ✓ Engineering List & Line List
- ✓ Engineering Drawing List
- ✓ Unit Rates
- ✓ Schedule
- ✓ Material Data
- ✓ Rules of Credit
- ✓ Document List
- ✓ Purchase Requisitions
- ✓ Purchase Orders
- ✓ Vendor Data & Document Transmittal
- ✓ AWP
- ✓ etc.

Why Use O3 for Data Management?

First, is **accessibility**. When data is managed in multiple sources, there will be an issue with people not having access to an application or file. Maybe the engineering team has the status of documents stored in an Excel sheet that no one outside of the engineering team has access to. Or a planner needs the know if a material is available for an IWP, but doesn't have a user in the material management software. Because O3 is a cloud-based application and there is no limit on the number of users, this data can be available at any time without relying on anyone else to provide it.

The second issue is **data accuracy**. When data is all managed in one solution, it will be compared across all sources which make any inaccuracies or inconsistencies become obvious. In addition, By interfacing with O3, these inconsistencies, such as differences in nomenclatures or dates not lining up, will also have many more eyes searching for them.

The third issue is **creating automation and reporting** based on relationships between data from different sources. A DMS may show you a list of documents that are associated with a work package, but O3 will go a step further and notify you if a document is not complete and the planned start date of a Work Package is a few weeks away. O3 offers this and many other types of relationships that can be used to create and clear constraints automatically all without any changes to the current process.

That brings us to the last issue, managing the integration of data. This requires a lot of time and a strict set of rules when done manually. So that is why we say, don't do it manually.

API Integrations with O3
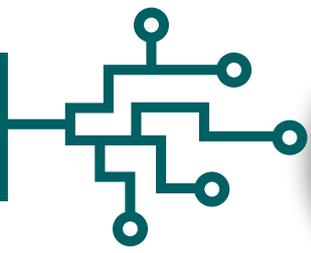
O3 has easy-to-use API calls. This is the ability to automate this process, which has provided our clients with huge value. And since O3 has API access to import anything automatically that you can import manually, the process to move to automated interfacing makes the process much easier.

If this process is managed by humans, you can count on human-created errors. Not only does this mean there is additional time spent tracking down and fixing these errors, but these interfaces need to follow a strict set of rules with API calls. This will help to find and sort out any remaining errors.

Automating the interface process also allows API calls to be scheduled during off-hours. This means a work package won't be updated while a planner is completing constraints.

Automating the process is also important because the process of managing all the different interfaces will get time-consuming. When implementing the use of O3's interfaces on projects, our clients continuing to find new ways to leverage the value they give - so the number of interfaces continues to rise and the value multiplies.

O3 & Data for Virtual Construction Models

O3 supports the consumption and display of over 70 different 3D model formats in its embedded web-based model viewer. This includes the consumption of all the additional data such as pipe fabrication (PCF), steel fabrication (ICF), line lists, equipment lists, and everything else required to construct a fully attributed virtual construction model (VCM).

O3 stores this fully attributed component data in its construction component database which allows for the graphical scoping of Installation Work Packages , as well the status visualization of constraint analysis and progress at the component level. This visualization aids in the efficient creation and sequencing of work packages.

True Work Package Management

We are paving the way for Workface Planners, Construction Managers, Project Managers, and Executive Teams to seamlessly manage and oversee the entire work package process across the entire project life cycle.

The Solution

O3 is modern SaaS application - that is easy to use, set up, and learn - and supports Advanced Work Packaging industry best practices. The platform removes manual processes, disjointed data sources, and countless spreadsheets from the package lifecycle, and automates many of the steps in the process from start to finish.

Using Data to Support Work Packaging with a 3D Model

O3 implements work packaging in the field - which relies of course on good quality data. Our Client Success Team helps project teams define the data requirements needed to support a healthy Advanced Work Packaging program. The software platform then leverages this well-organized data to enable automation of the work packaging process and ultimately drive users to efficient execution.

The Benefits

We can use 3D model data directly from the models for construction scope. No need to export the 3D model data to other formats such as Excel or CSV and then use the data in speared sheets for planning or construction use. The user can visualize the objects that are going to be built, and do visual inspection along with all its relevant data.

3D models can be linked with many other resources, such as drawings, Bill of Materials, documents, schedules, etc. All the related information needed for construction can be accessed through the 3D objects in an organized way.

When work packages are delivered using a 3D model, screenshots of 3D objects are also included as visual documentation.

Visual reporting, like 3D model colorization based on data, such as status, constraints, approvals, and progress will be highly beneficial.

3D Model Data Framework

O3's ONBuild Construction Component framework is a highly flexible and dynamic framework. This feature will enable users to use 3D model data effectively in the Work Packaging. The framework is designed in a way that, the user can create Construction Components based on data collected and conditioned from various sources such as 3D model data, fabrication data , calculated or derived based on other data. We can also import external data and include them to create a Construction Component enriched with all these data from different sources but for the same purpose.

Construction Component is discipline specific, it can contain one or many 3D model objects. Same 3D model object could be used in different Work Packaging scope, so we allow to use the same 3D object to create Construction Component for different Work Packaging scope. For Example, 3D Objects used for fabrication work packaging can later be used for erection work packaging in a different combination. May be in a later stage it can be used for test work packaging. For sure, Construction Components for these different scopes will have different relevant data sets and graphical grouping.

ONBuild Construction Components can be created even without 3D model data.

ONBuild Construction Components Concept

3D Model Data → Fabrication Data → Calculated / Derived Data → External Data Etc… → ONBuild Construction Component
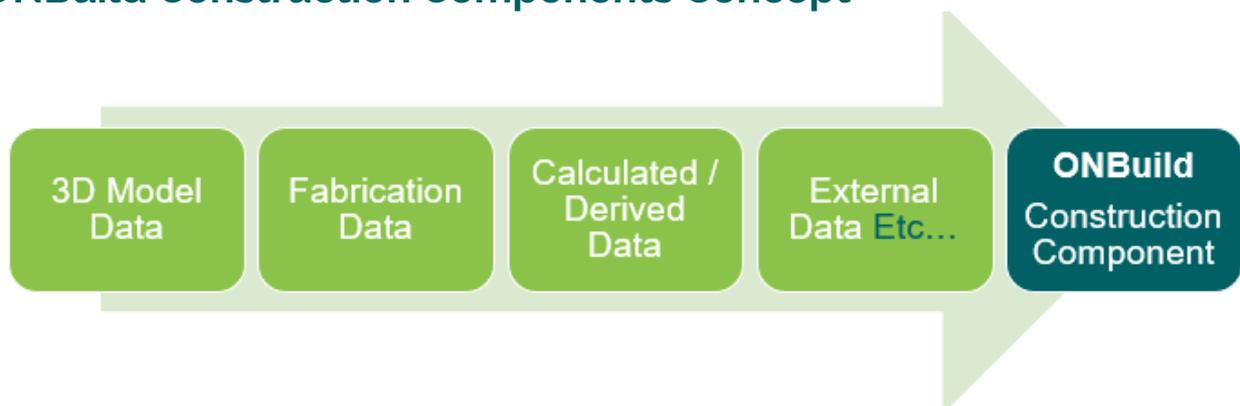
3D Model Data Examples: Piping

In piping, there are generally two types of data. Design data and fabrication data. When we use a 3D model for work packaging, design data and fabrication data could be incorporated with the work packaging.

Design data will detail the pipeline to the isometric level. When the purpose of work packaging is fabrication then the construction component can be created at the isometric level with the needed fabrication information.

You can see in the image that the construction component is an isometric, which will be a single object in ONBuild, and the object will have the property of the isometric. The Workface Planner can select isometrics and then add them to a Fabrication Work Package. ONBuild will also store individual piping component properties separately for each piping component of the isometric, so no data will be lost.
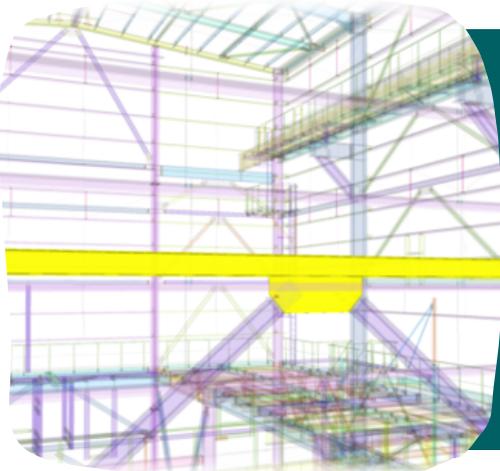
In the erection stage, additional information is needed because many of the piping components will be grouped as a single unit in the fabrication shop. These grouped components are called a spool and will be brought to the site as a single unit. The additional information, usually available through a Piping Component File (PCF), should be incorporated with the 3D design objects.

O3's ONBuild construction component data model allows the user to add additional information to design objects, group them per the construction objects, and use them in to create work packages. These construction components seamlessly link to its Bill of Materials (BOM), drawings, specifications, and documentation based on its purpose. In addition, resource status checking, constraints, and execution tasks based on the construction purpose will be automatically included in the work package.

3D Model Data Examples: Steel

The steel model is similar to the piping discipline. This example uses a "stick-build" erection scope. In steel design models, usually data for steel members and plates are included. For the construction work packaging scope, especially for erection scope, 3D model data is needed from the fabrication models. Design 3D models will be detailed in the detailing software. In the detailing process, the structural members that can be prefabricated in a fab shop will be identified and grouped based on engineering details. Then a unique identifier for the group will be assigned. For erection scope, this assembly will be a single unit in the construction site for erection.
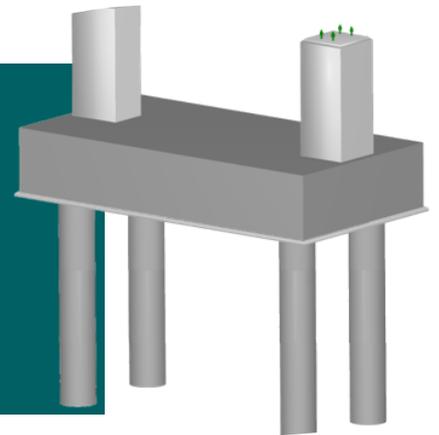

Steel fabrication model data will show as red in the model, along with the assembly information, to create steel construction components. Additional information such as total weight, length, and more will be calculated and added to the steel construction component from the model data or as imported data if it is not available in the assembly. An assembly can be selected in the 3D model, and it will select all prefabricated members together. Then it can be added it to a work package as a single unit.

All relevant information for construction, based on the scope, will be linked with construction objects (e.g. erection drawings, Bill of Materials including bolt lists, and documents, etc.) When a Workface Planner adds steel construction components to an Installation Work Package, O3's ONBuild solution will pull all relevant 3D model data and all its resources into the package. Many related activities can also be automatically triggered, such as performing material coverage checks, checking the status of drawings and design, adding or updating constraints, and adding execution tasks based on the purpose of work package.

3D Model Data Examples: Concrete

In order to use concrete efficiently in work packaging, 3D concrete objects should have certain properties. In most cases like piping, steel, and equipment, the objects from these disciplines are well organized and tagged. Equipment will have equipment names, piping will have isometric names, and so on. In many cases, a discipline like concrete may not have this information in a 3D model. This is one of the reasons project teams struggle to include concrete in work packaging.

O3's ONBuild concrete construction component needs some mandatory information like object tag. Objects should be modeled based on the construction sequence. In many cases, concrete will be modeled without seeing its construction sequence. As an example, the foundation has many parts, like piles, pile caps, pedestals, grout, anchor bolts, and more.

It is very common to see these different construction objects graphically grouped as a single object in the 3D model. This single object will not match with the construction sequence as it is not built in one phase, rather it's built in many phases. A single object in the 3D model cannot store its data properly. This will make the 3D objects of this discipline difficult to be used in work packaging.

It is very important to model concrete objects based on the construction sequence and tag the concrete objects separately so that we can link them to their relevant drawings, Bill of Materials, calculations, documents like bar bending schedule, etc.

3D Model Data: Non-Modeled Items

O3 ONBuild Construction Component data model provides an option to link non-modeled construction objects to its relevant modeled Construction Component.

For example, linking cable tray systems with cable schedules.

Once the link is established then the Workface planner could create a Work Package for Cable Pulling

In order to establish such a linkage between 3D model objects and non-modeled objects, a common link should be available in both data sources.
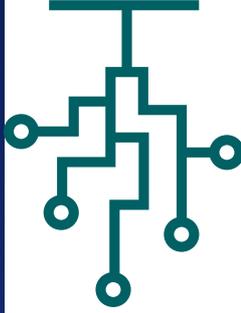
O3 & Data Consumption

O3 has never encountered a data set that could not be easily brought into the solution. The platform is extremely flexible: it supports RESTful APIs for real-time bi-directional integrations, flat file import/export for less sophisticated solutions, and webhooks for on-demand data exchanges.

O3's Client Success Team works with each project or facility to understand the unique data integrations needed to support where you are in your AWP journey. If you are still relatively new to AWP, you may only want to connect a few sources, such as a materials management system, your P6 schedule, and a couple of Excel spreadsheets.

If you are new to AWP data management, that's not a problem, O3 has a standard set of AWP data requirements that will guide you to understand the fields, format, and frequency of data that is required for your AWP project.

O3 Data Case Study

LNG Facility Eliminated 70 Hours of Manual Reporting with Data Integration

The original intended use for O3 on this LNG facility was constraint management. In the beginning, O3 configured the work package workflow and constraint management requirements as quickly as possible. However, at the same time, we started the process of evaluating the data involved to see how we could make people's lives easier by bringing additional data into O3.

Solution

O3 is built to act as a data repository: data from multiple systems is available to use and organized in a logical manner. This immediately solved a major issue on this project - data availability, but it also added valuable reporting. With the added value of API integrations, the risk of data being out of date is drastically reduced. The API process automated work that would otherwise be done manually and brought to light several inconsistencies from one data source to another.

Results

This client has documented a **savings of 70 hours per week** from the elimination of manual reporting alone. This does not account for the productivity savings in the field that results from the release of constraint-free installation work packages that is also powered by O3's data management capabilities.

Learn More

Discover how O3 supports Advanced Work Packaging with DATA.

O3 is a modern web-based platform that manages construction data across the entire project lifecycle from concept through commissioning. As the only software suite purpose-built for full project Advanced Work Packaging, we have many different solutions built to meet you where you are in your AWP journey.

Our software is highly scalable and can be used on small brownfield projects, mega greenfield projects, and everything in between. By managing portfolios of small-cap projects in a single modern web solution, data management for AWP is no longer cost-prohibitive.

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