DATIFEX

# FleetView MS™

## Maintenance & Support Whitepaper

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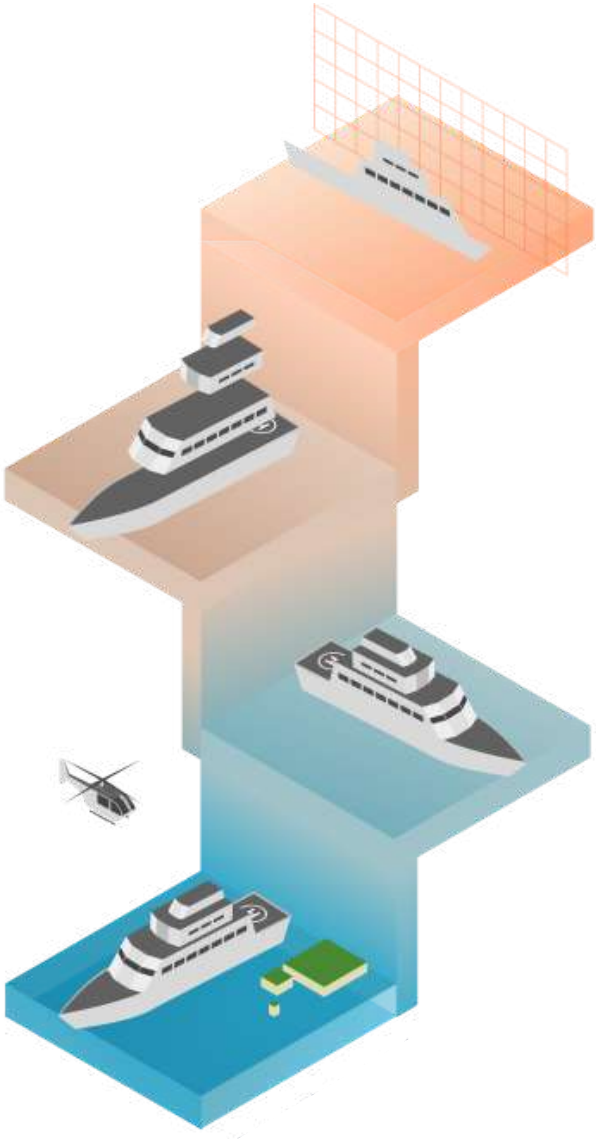

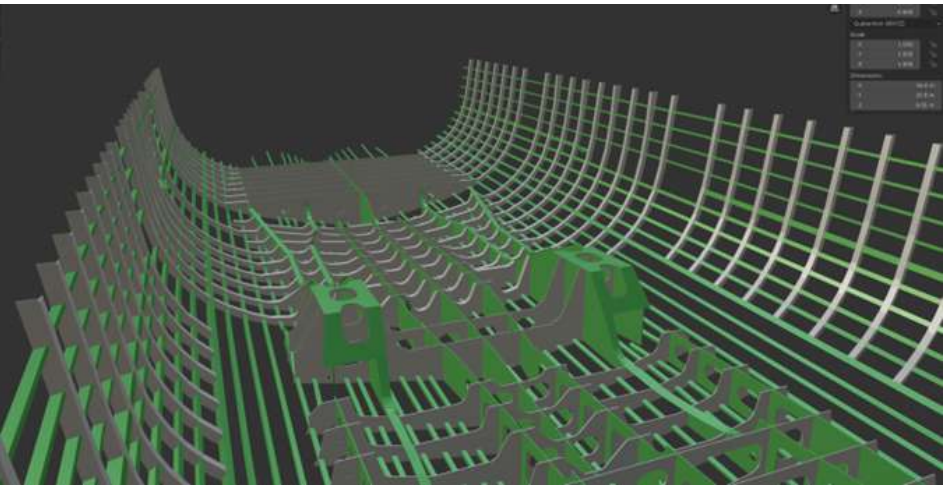

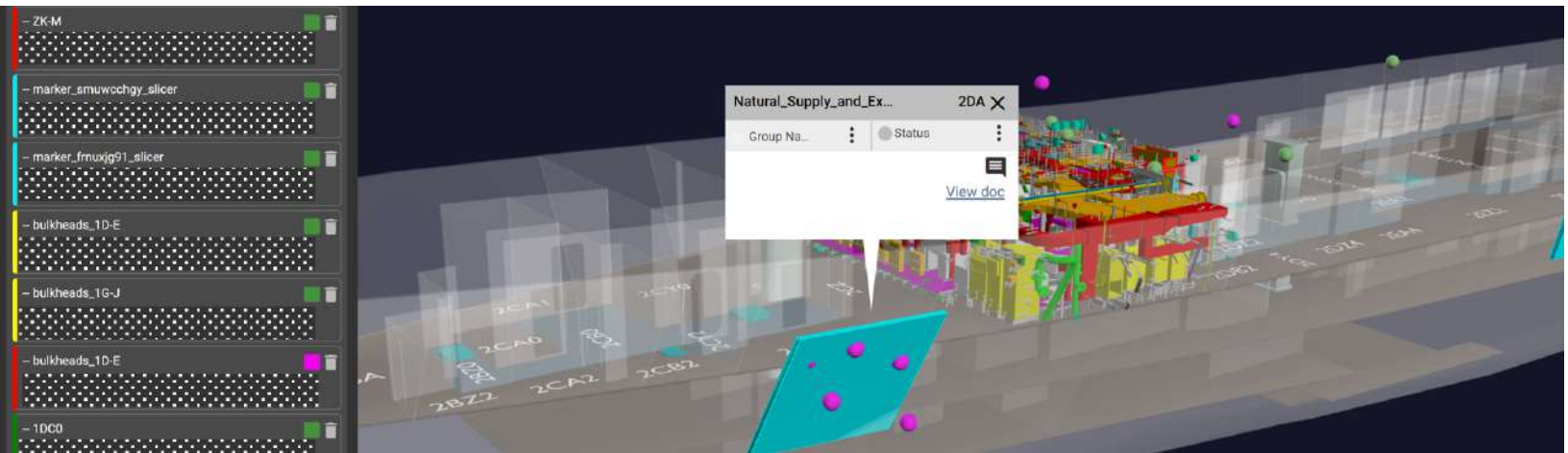
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## Digitally transform operations.

In this whitepaper, we will explore how Datifex builds the industrial metaverse with immersive 3D web applications by combining data, decisions, and people in a "single pane of glass."

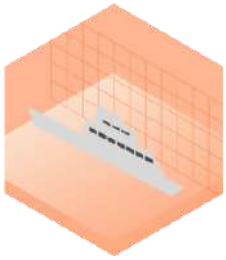
Starting with a high-level overview of our process and application architecture, we'll then examine the capabilities and features of our technology in the context of the FleetVIEW 3D application.

## Our Process

Datifex applications are tailored for each client's use case, from terminal operations to ship maintenance planning. We support any 3D model, connect any data source or external system, and make it all accessible in a browser on any device.

By creating shared situational awareness with unmatched command and control, we make models, data, and people work together effortlessly. A single place where users can easily access and interact with disparate sources of information enables teams across organizations to make better decisions more quickly.

Our approach is agile, designed to minimize risk and maximize ROI. We collaborate with users to deliver value early, get feedback, and integrate with existing systems. As your operations evolve, we're here to help you continue to implement your digital transformation.



Inventory your data, goals, and opportunities

Build custom 3D environments

Connect data sources, prototype workflows

Real life testing, iteration, and improvement

## Application Architecture

Below is a high-level overview of Datifex's application architecture for reference as we dive deeper into FleetVIEW 3D, its features, and its capabilities.

Worth noting are the product names referenced in the diagram:

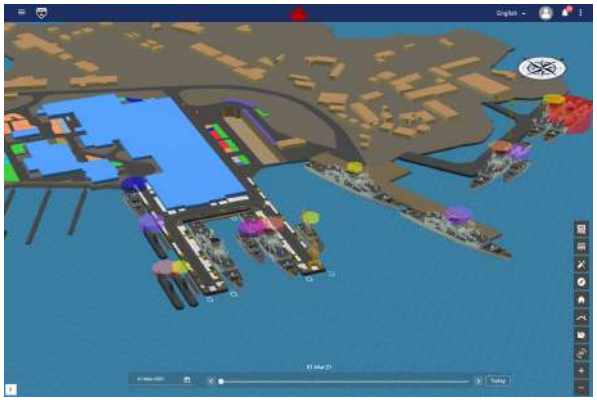
- IntelliVIEW 3D: the physics engine we've configured, libraries we've created, and the framework of features we've developed.
- DigitalTWIN 3D: the infrastructure, tools, and processes we've built to optimize complex 3D models, attribute data, and configure them as "digital twins."
- FleetVIEW 3D: the specific web applications and features used for work period planning, ship maintenance, and certification tracking.

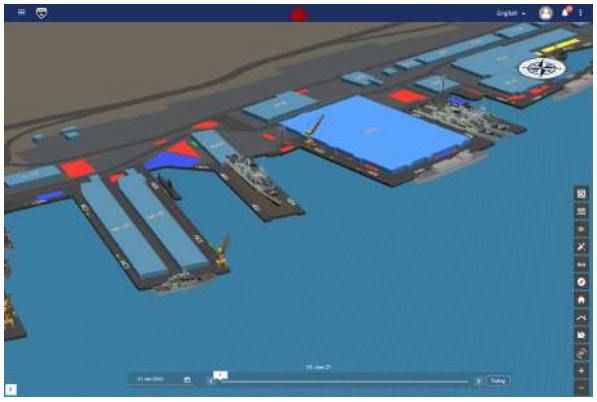
## Accessibility is paramount.

Core to Datifex's approach is access to information, helping to create a shared operational picture across an organization. By making information available to everyone in real-time, whether users are onboard a ship or in a boardroom, teams can stay in sync as situations evolve.

Our applications are useable on any desktop computer, laptop, or handheld device. Whether you're using a mouse or finger, our UI/UX is intuitive and easy to navigate. All our applications are available on a modern web browser.

We make credentials and permissions easy to manage by leveraging single sign-on, typically linked to users' Teams IDs. From there, we can customize what information individuals see and the features they can use.





## Replicate real-world environments virtually.

Each application starts with a 3D Venue, often a virtual representation of the real world. This scene provides context for models and objects. It can represent any environment, asset, or even something more abstract, like processes.

Using our IntelliVIEW 3D Engine, we leverage our curated JavaScript libraries and build these scenes programmatically. In contrast, many other "digital twin" companies do this manually, designing the scenes and objects "by hand."

IntelliVIEW 3D also customizes the lighting and camera angles and incorporates our open-source physics engine. The scene is then controlled by the HTML web app features that allow you to search, filter, and more.

What's essential about design at this stage of development is that the information displayed when the user loads the application is relevant, not overwhelming.

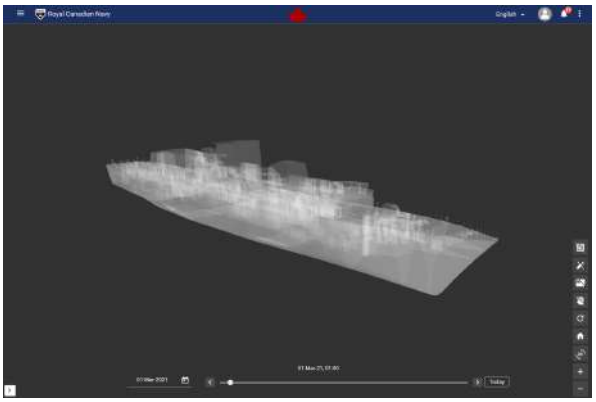
## Interact with any 3D model, all in the same place.

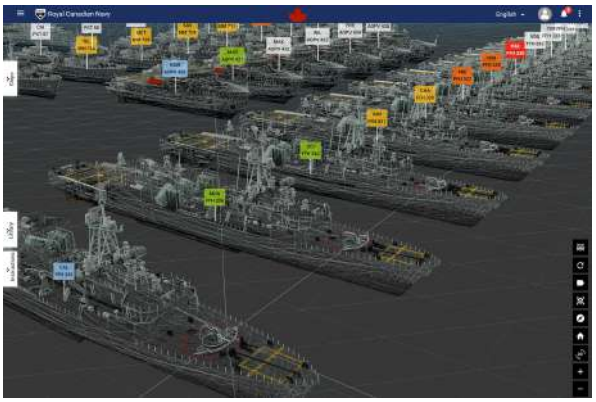
With the stage set, we now integrate models and other "objects." Datifex can standardize and integrate any file format (AutoCAD, 3ds max, Blender, .obj, etc.), making ships designed using different CAD software accessible within our web application with no need for multiple viewers.

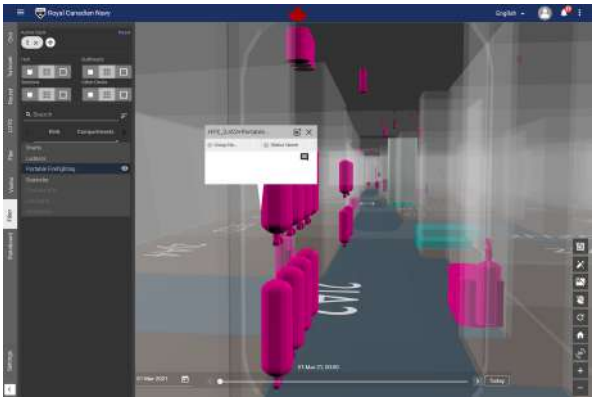
As part of this process, Datifex turns various objects into "mesh," making CAD models discrete, reducing their file size, and standardizing their format. All are part of optimizing models for web browser access and fast loading speed.

An object's mesh is determined by its metadata; for example, within a ship, we can filter and view all the components tagged as part of "portable firefighting equipment" or any other grouping defined by the modeller. Users can then particularize what they'd like to see and load information related to a specific ship, zone, compartment, etc.

The physics engine then allows users to highlight and move objects. For example, users can load a compartment and rehearse a sequence of activities required to access a particular component.







## Connect and control data from any source in a "single pane of glass."

Building on the framework above, we're also able to attribute other data sources to these objects, enabling the user to connect disparate databases or other external systems via various protocols, e.g. REST API, web socket, etc.

Essential to this data connection is the ability for two-way communication, i.e. users can both pull and push information while interacting with objects in the 3D scene.

This data integration, real-time or otherwise, enables users to put data into situational context, making it easier to find information and make decisions. Users can then update separate external systems within a single interface.

An example of a use case that this enables would be conditional monitoring of an asset for maintenance. An engineer investigates the status of a system on a particular ship, viewing IoT data that's been integrated with the system's components alongside certification information that's been pulled from the PLM. The engineer could then update the certification information in the PLM from within the Datifex web app, update the system's status for everyone to see, and add notes for other users to reference, a feature we'll explore in the next section.

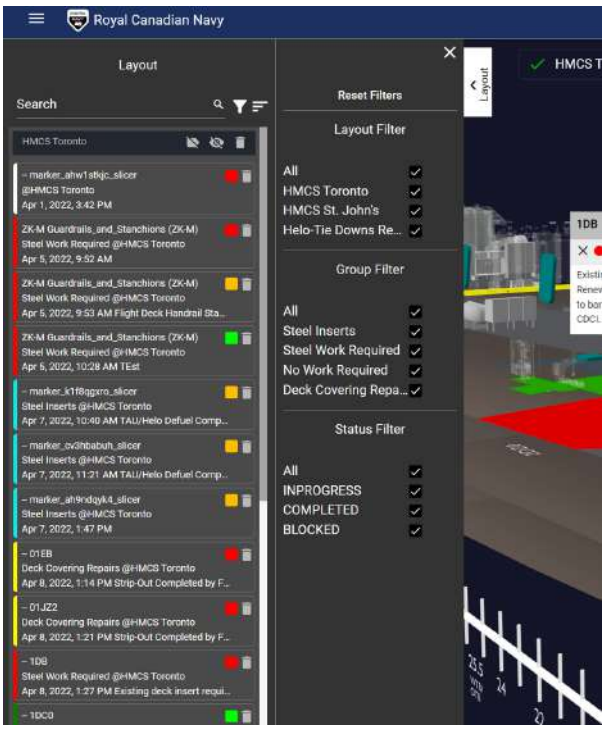
## Collaborate and integrate workflows.

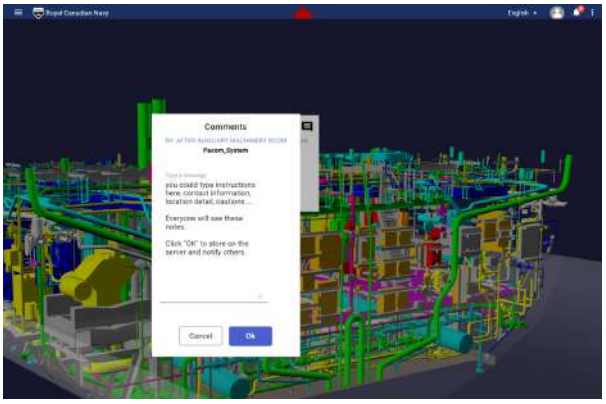
Now that the models and baseline data are integrated with the scene, users can interact with the objects and add additional information for collaboration.

Each time a user adds information to an object, it's called a "tag." The properties of tags can be customized and include the shape of a tag (e.g. a sphere, a cutout, the highlighting of a compartment, etc.), the information collected in the tag (e.g. custom web form fields, "signatures," etc.), and how to organize tags. Users can then search and filter these tags based on their categorization.

A simple example would be adding a tag to the decking that includes the instruction for a work period, uploading supporting documents, tagging relevant users, and having a conversation in the comments sections to support collaboration.

Simple features can have important real-world implications and improving safety is an excellent application. Marking systems involved in lockout tag out allows for visual deconfliction of related work, but also lays the foundation for optimized and automated scheduling.

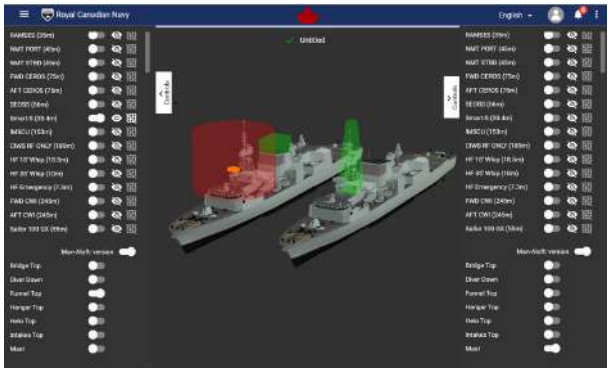


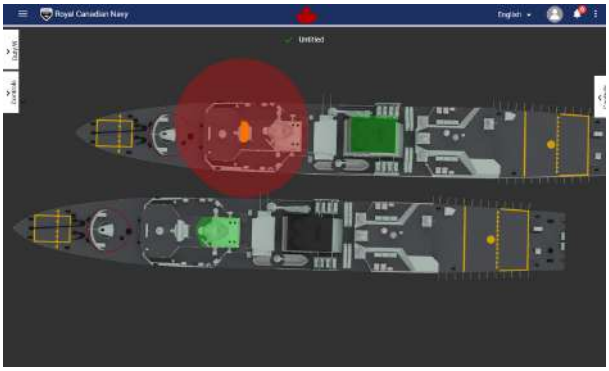


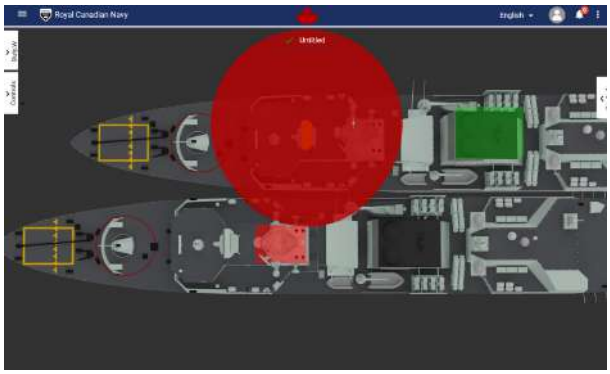
A more complex workflow associated with tags is the scheduling and deconfliction of activity onboard a ship. For example, if an emitter needs to radiate, a user can schedule that activity and the web app logic will:

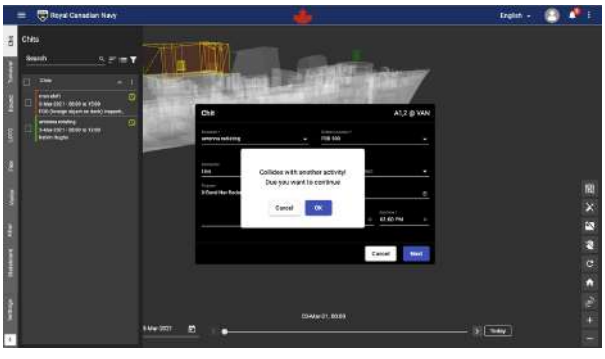
i) determine if there are any conflicting activities at the same time based on the "area" attributed to the scheduled activities and their workspaces;
ii) provide a web form to collect the necessary information;
iii) notify and collect the signatures of necessary parties.

Visualization is beneficial for de-conflicting activities; time-stamps allow users to view all work taking place by the hour, past, present, and future. Depending on the type of work, Datifex can attribute logic to a workflow similar to the radiate example. At baseline, the visual element allows them to see the time and place work will occur and then make decisions accordingly, a much more difficult task when working with a spreadsheet. With that foundation, proximity conflicts can be identified using the physics engine.





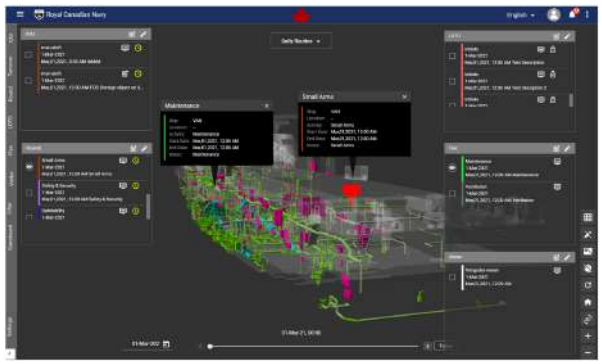


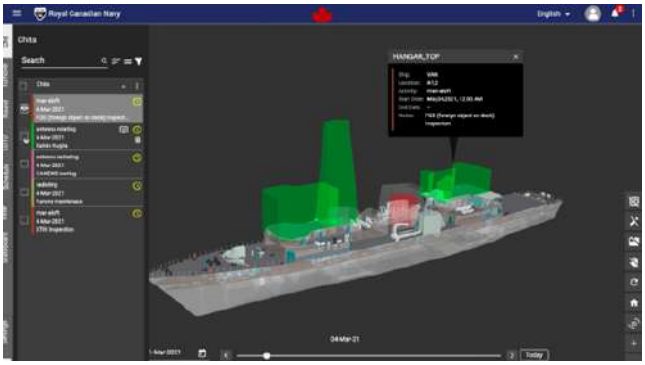


## Organize and visualize activities.

Each of these "tags" belongs to "collections" defined by the use case. For example, the collection could be activities, defects, etc. The tags can also have two custom "groups" assigned to them, for example, the work package they belong to and its work status. Ultimately, these collections and groupings are highly flexible and can be determined based on workflows. At a higher level, a series of collections can be saved as a "layout," allowing users to customize further what information they see and collaborate on specific projects.

These collections are then organized and visualized on the "3D State Board," allowing users to overlay the information they've added within the scene and the various objects. The 3D State Board provides the next level of situational awareness and information accessibility, enabling visual schedule deconfliction and coordination, as previously mentioned.





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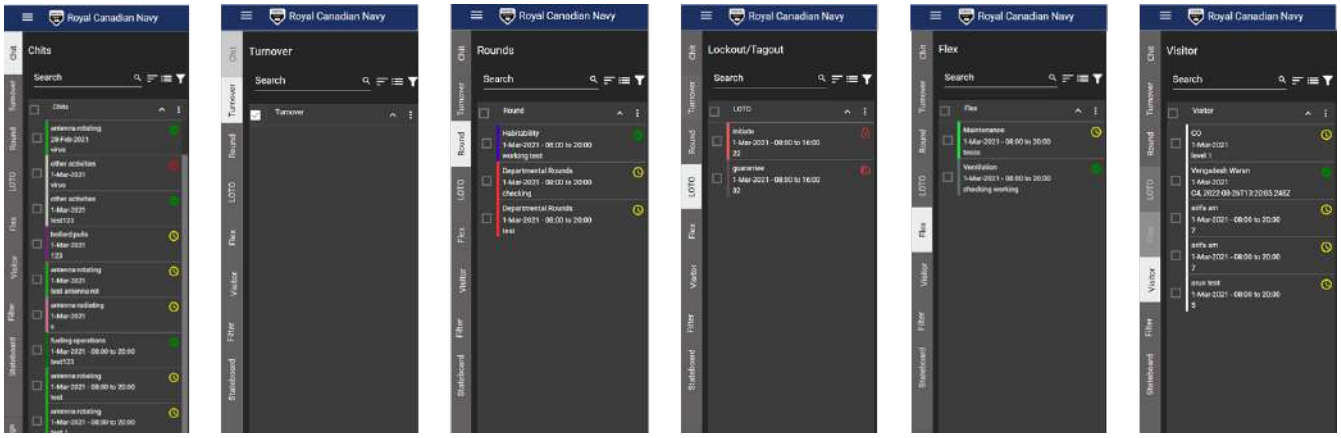
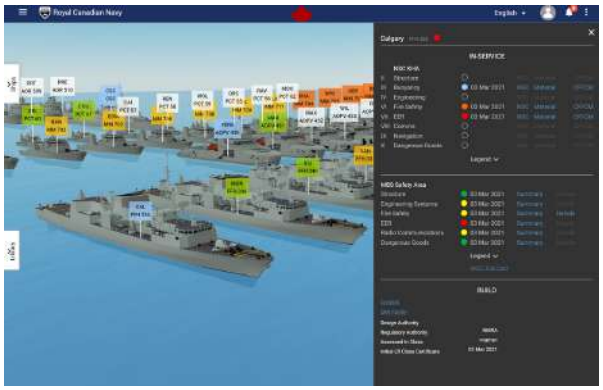


## We are building a system of systems.

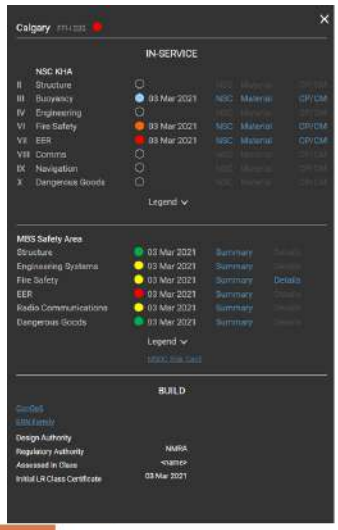
Once an application has been built around a scene, models, and data, it can be integrated with other applications to create a system of systems.

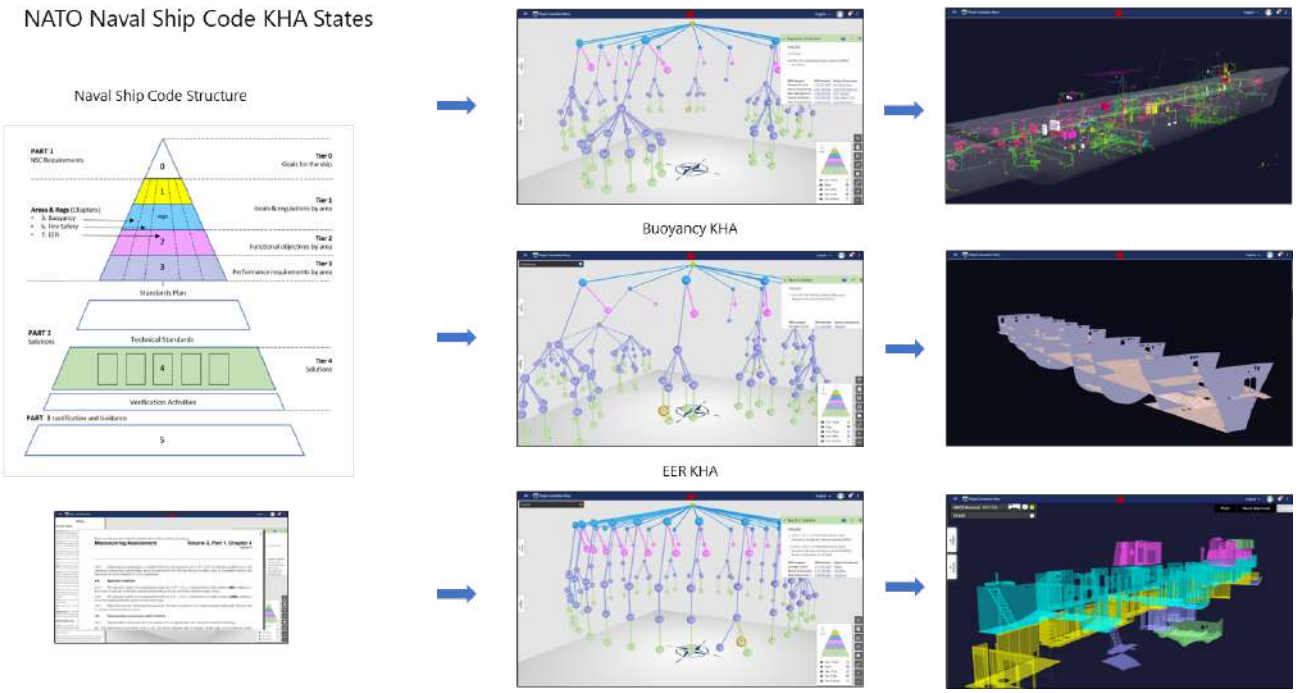
FleetVIEW 3D starts at the highest level with a summary of the operational readiness of each ship, the status of its subsystems, and the ability to drill down into each.

Accessible from this view is a link to a visual representation of the LR Naval Ship Code, requirements for each Key Hazard Area, and the ERNs for the systems and components onboard a ship that impacts each regulation.



Connecting these assets and processes allows the user to investigate and communicate any issue impacting a ship's ability to float, move, or fight.






## A system of engagement for your system of record.

Essential to digital transformation is changing users' behaviour by making technology accessible, intuitive, and engaging. With Datifex, we can customize the features to incorporate your workflow as your organization evolves, ensuring that your solutions are agile and effective.

Today's ships are complex, and the logistics required to support Canada and its sailors are immense. Datifex makes it easy to interact with the vast amounts of information associated with each ship, enabling those managing the vessels to implement process improvements incrementally that ultimately contribute to a system that is more than the sum of its parts.

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# Scan to see industrial metaverse web apps

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