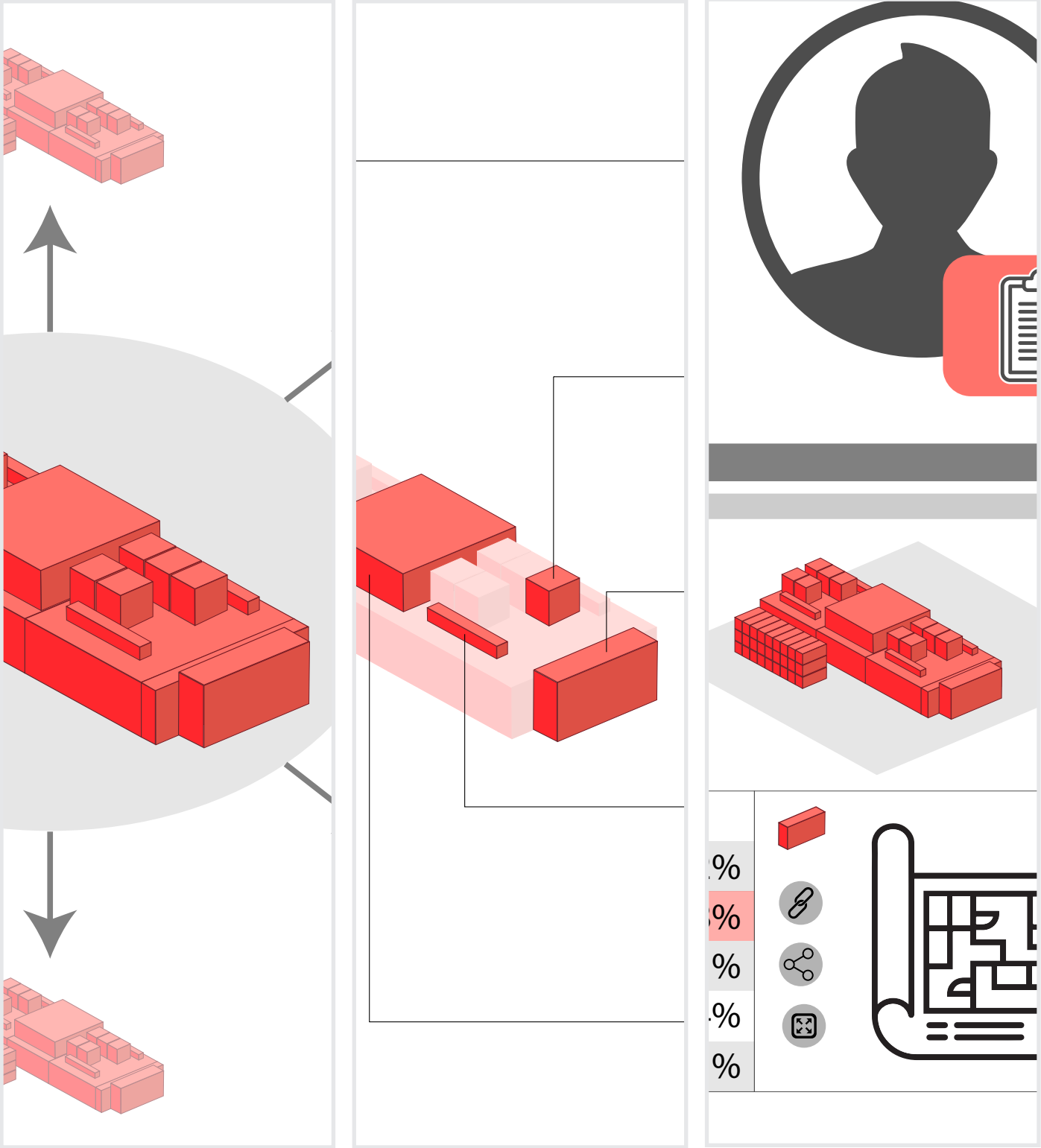


# Introduction to Design Assets

A Three-Step Approach to Streamlining your Facility Portfolio



# Introduction

Many large organizations rely on a portfolio of built assets to carry out their broader commercial objectives. Increasingly, organizations across a range of global markets are examining ways to manage their portfolio of built assets more strategically. A common approach to strategic portfolio management applies concepts of mass production: replicate a design to achieve better return on investment and economies of scale. Specific facility designs are prototyped and used to drive standardization across geographic regions. Through this approach, an organization stands to benefit in many ways, including:

- Accelerated speed-to-market of new building facilities
- Improved consistency across their portfolio
- Enhanced quality control
- Reduced risk in built asset delivery
- Improved cost efficiency
- Better technological adoption

There are however a range of challenges that organizations face when seeking to realize these potential benefits. Standardization of facility designs can be undone by variations across project sites due to availability of materials, equipment, nuanced local building codes, climate differentials, and disparities in site design requirements. Organizations also struggle to enforce the proper use of the approved versions of equipment, design standards, and technical specifications. As design standards evolve, various project teams must continually adapt.

There is also a variety of different procurement and construction methods to consider. If speed-to-market is a priority, for example, a range of modular strategies can be examined to find the best balance between shop assembly and site construction. And digital tools that enable the early selection of long-lead systems can help remove them from the schedule's critical path.



**Jaguar Land Rover Engine Manufacturing Centre, UK**

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## Frick Chemistry Laboratory, Princeton University USA

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At Arup, we offer our clients a range of consultants and subject matter experts to create strategic digital and functional business enhancements to processes for planning, designing, delivering, commissioning, operating, and maintaining built assets. Our facility design teams help organizations establish optimal designs that balance considerations of operational performance, cost, and regional flexibility. Our specialist digital consultant teams help our clients with digital tools and information management strategies, enabling large organizations to coordinate across stakeholder groups,

respond to local variability with standardized solutions, adapt to evolving technologies and facility designs, and make decisions informed by portfolio-wide data that is easier to access and understand.

Process enhancement within a large organization can be a significant undertaking. Arup has developed a three-stage process for organizational change management that offers incremental improvement over time. Arup's approach adopts a design and build methodology referred to as **Prototype, Catalog, Deploy**.

Prototype

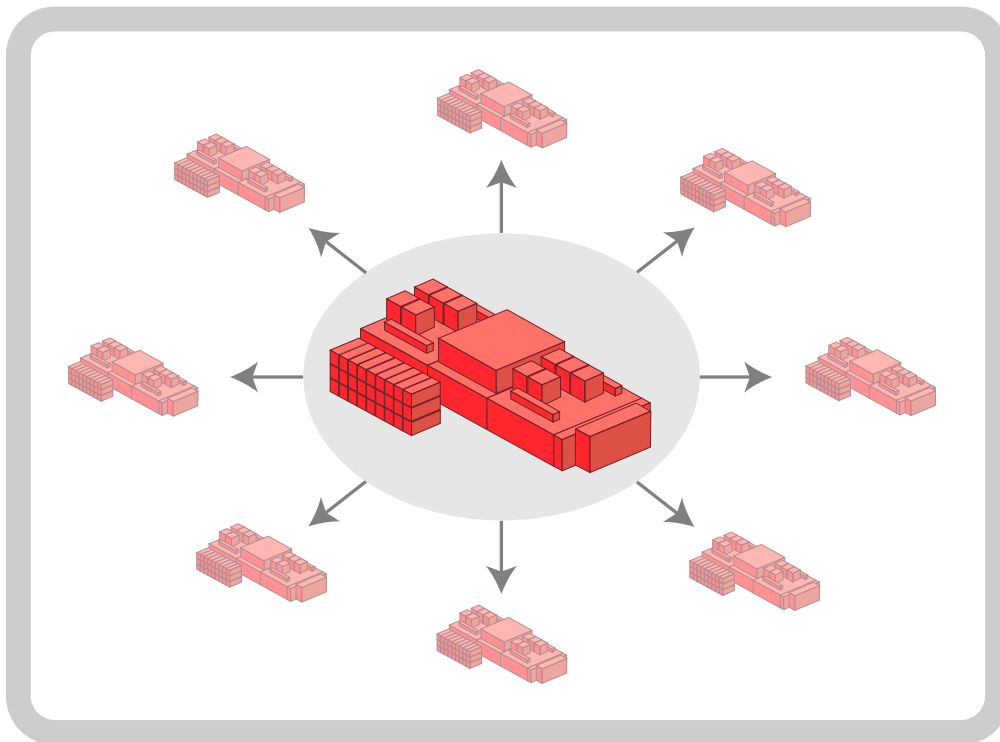
## Prototype

Organizations begin this journey by defining the “best-in-class” version of each facility type through reference designs. Adopted widely in some markets, reference designs continue to emerge in others. Reference designs offer a powerful way to begin standardizing a portfolio of built assets. In this stage, Arup assists organizational stakeholders in the development of a reference design strategy for their portfolio. Reference designs are then developed, often through the strategic selection of active design projects that provide a cost-effective vehicle for defining regionally tailored prototypes.

In the Prototype stage, reference designs are developed with standard project outputs, including BIM documentation, technical specifications, and reports that outline the steps involved in adapting the reference design to retrofits and new site construction.

The Prototype stage provides a reduction in the scope and cost of site design consultants, as they will be tasked with adapting reference designs rather than designing from scratch. It also enables the implementation of organization-wide governance over standards for design and delivery, yielding new assets that are more consistent with each other and with a documented definition of “best-in-class”. If carried out well, the reference designs can also help reduce the use of non-standard, more expensive vendor products and components through the specification of components to be used during project inception.

## Facility prototypes define ideal characteristics and make them repeatable



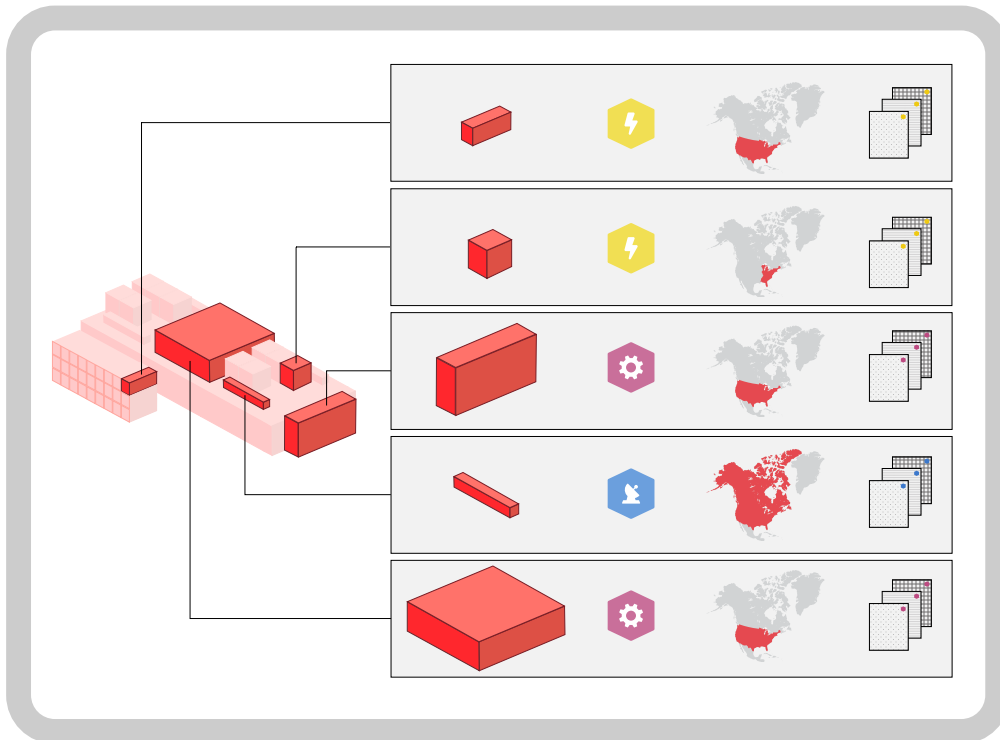
# Catalog

## Catalog

In this stage, the reference designs are used to develop a comprehensive catalog of equipment, assemblies, materials, standards and other components for use in defining site adaptations. By cataloging the constituent parts of reference designs, an organization empowers a wide range of stakeholders to contribute to the ongoing management of project information, and to benefit from that information. Procurement teams can curate the component catalog, replace obsolete vendor systems with new ones, and store information required by downstream stakeholders in one place. Project managers for a specific site adaptation project can leverage the catalog to create site-specific configurations.

Organizational processes are enacted in this stage to capture design variations encountered in each site adaptation to iteratively build the catalog, enhancing its flexibility over time and enabling its adaptation to new technologies implemented when they are ready for inclusion. The catalog is delivered as an organized set of documents stored on the organization's preferred content management system, with a browsable index of components and related documentation.

## Catalogs enhance the flexibility of prototypes and aid in decision-making



Deploy



## Deploy

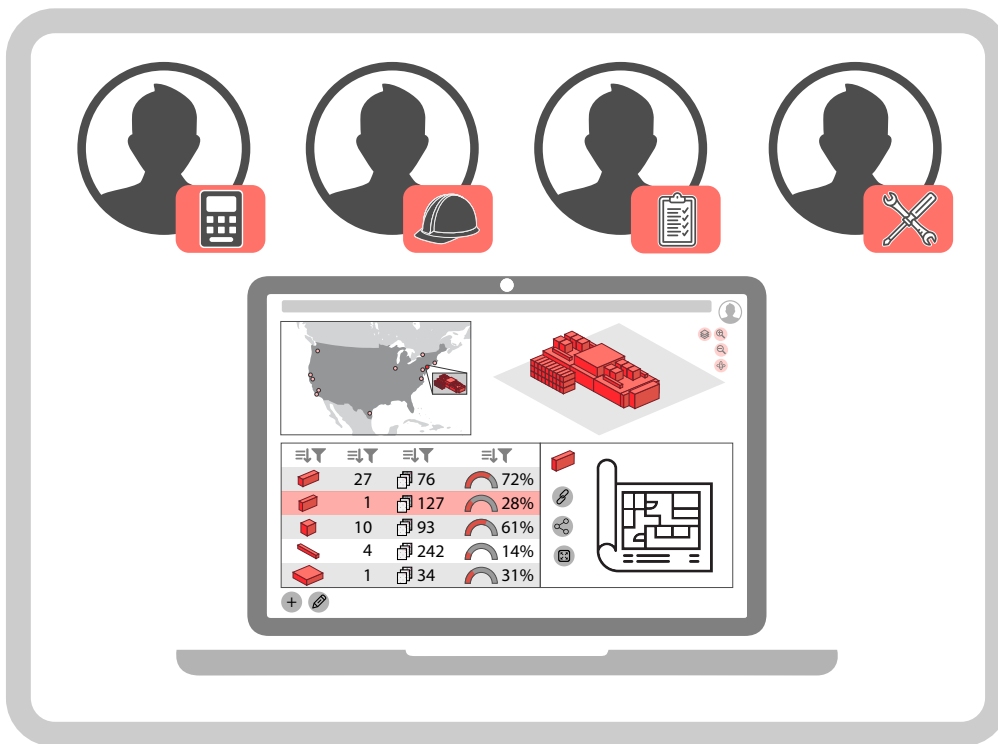
The deployment stage involves the implementation of software to enable better curation of the component catalog. The software serves as a “single source of truth” for all project stakeholders, and can readily adapt to the specific needs of a user by providing a tailored view of relevant documentation on a project.

The software enables project managers to easily add or edit the components associated with a specific site adaptation. They can similarly manage the project team members, enabling users from both within and external to their organization to view up-to-date component information and supporting documentation. This workflow often replaces more conventional approaches that involve the browsing of legacy project repositories for relevant component documentation. The enhanced workflow reduces the time and effort involved in developing a comprehensive definition of a new site adaptation, and significantly reduces the risk of the project manager using incorrect or obsolete document references on the new project.

For the team responsible for managing the component catalog, the software enables a streamlined view of the current component list and supporting documentation. Catalog managers can review the completeness of information for components and proactively identify information gaps. As systems are replaced by upgraded options, the catalog managers can flag components that are no longer available for ongoing implementation in new designs. These obsolete components remain in the system however, for ongoing reference by relevant past project teams and the managers of existing facilities.

The system likewise provides a portfolio-wide view of components, and their frequency and distribution across projects. The resulting information can be used to inform ongoing strategic decisions around vendor procurement, project standards management and updates to reference designs.

## Deployed software automates processes across the building life cycle



This three-stage process empowers a large organization to adopt a mass-production approach to their portfolio of built assets. Facility reference designs are initially treated as the repeatable component, and with the strategic use of software and information management, these designs are subdivided into modular components that provide enhanced flexibility. Individual site designs can adapt to local needs while maintaining conformance with standardized guidelines developed to minimize risk, maximize delivery speed and yield optimal asset performance.

The modular components of an organization’s facilities serve as reusable Design Assets. Our extensive, cross-market experience with the strategic development of these assets is coordinated by our digital team with in-depth support from a range of experts across our consulting and facilities design teams. If you would like to explore how your organization could implement Design Asset Management to enhance the development, maintenance, operation and capitalization of your portfolio of built assets, contact Zak Kostura in our Advanced Digital Engineering team.



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