



Unlocking the world of industrialized construction

Ollie Green & David Flynn
KOPE | @kope.ai





KOPE is the first software platform for
offsite, bridging the gap between design,
manufacturing and construction.



Introductions



Ollie Green



David Flynn

Product Manager at KOPE

Ex-architect & software developer

Leads development of MMC Market

Co-founder of KOPE

Ex-architectural technologist & BIM specialist

What we'll cover

Challenges in UK Construction



The shift towards industrialized construction



Building an online marketplace

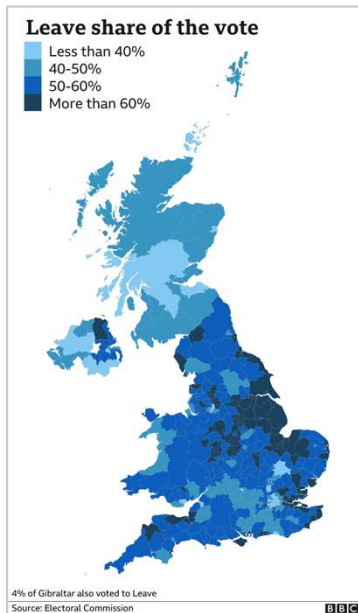


The Future



The State of Traditional Construction

How we got here



2016 EU Referendum

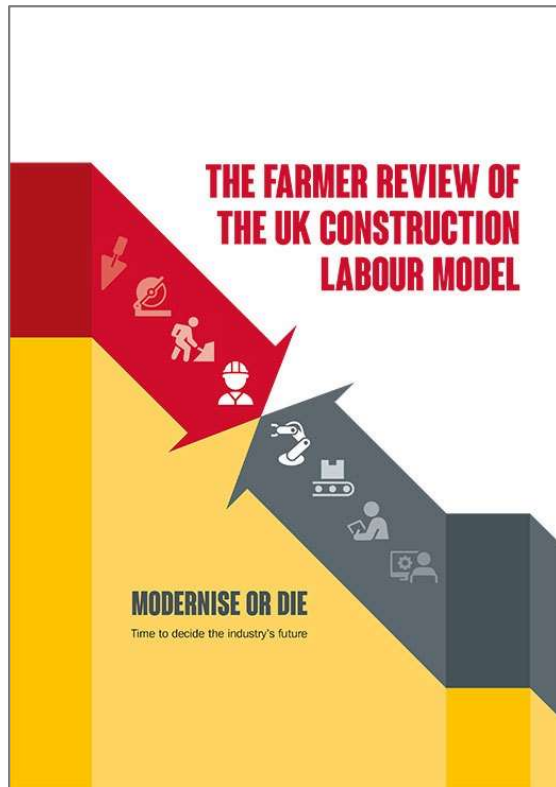


UK leaves the EU in 2020



Years of uncertainty for migrant workers

‘Modernise or Die’



2016 Farmer Review

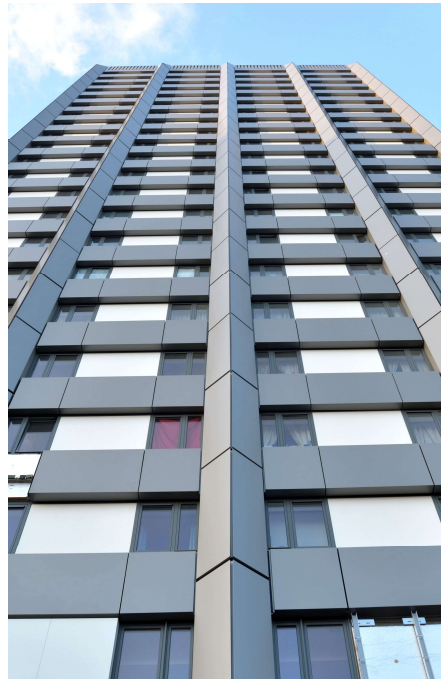
“The construction industry is in dire need of change. What is clear to me following the nine months spent conducting this review is that carrying on as we are is simply not an option.”

Mark Farmer, 2016

The Grenfell Tower fire



Original Grenfell Tower



Flammable replacement cladding



Building Safety Act 2022

CHAPTER 30

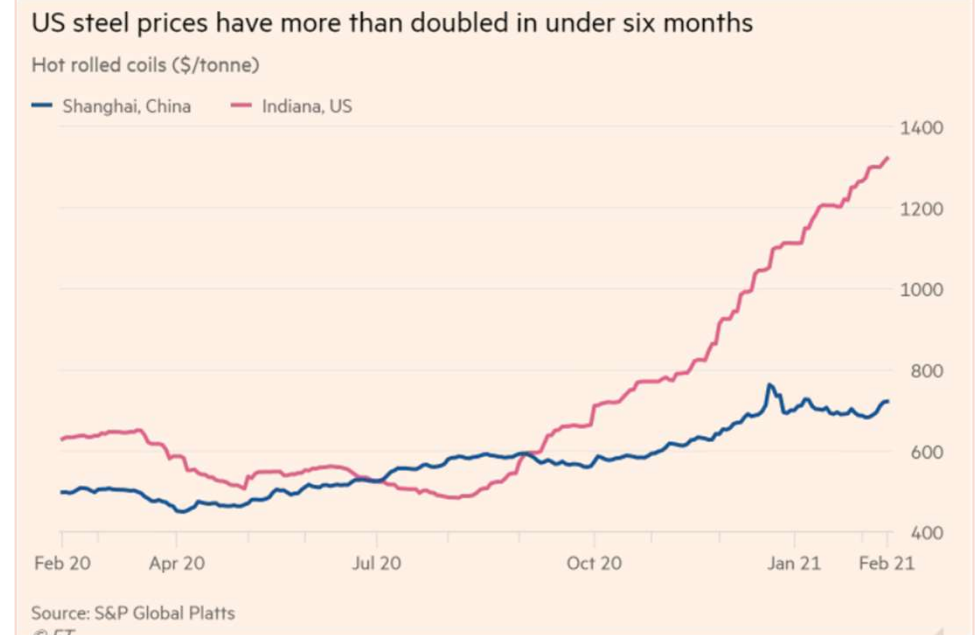
Introduced May 2022

Supply chain disruptions

High demand meets low supply

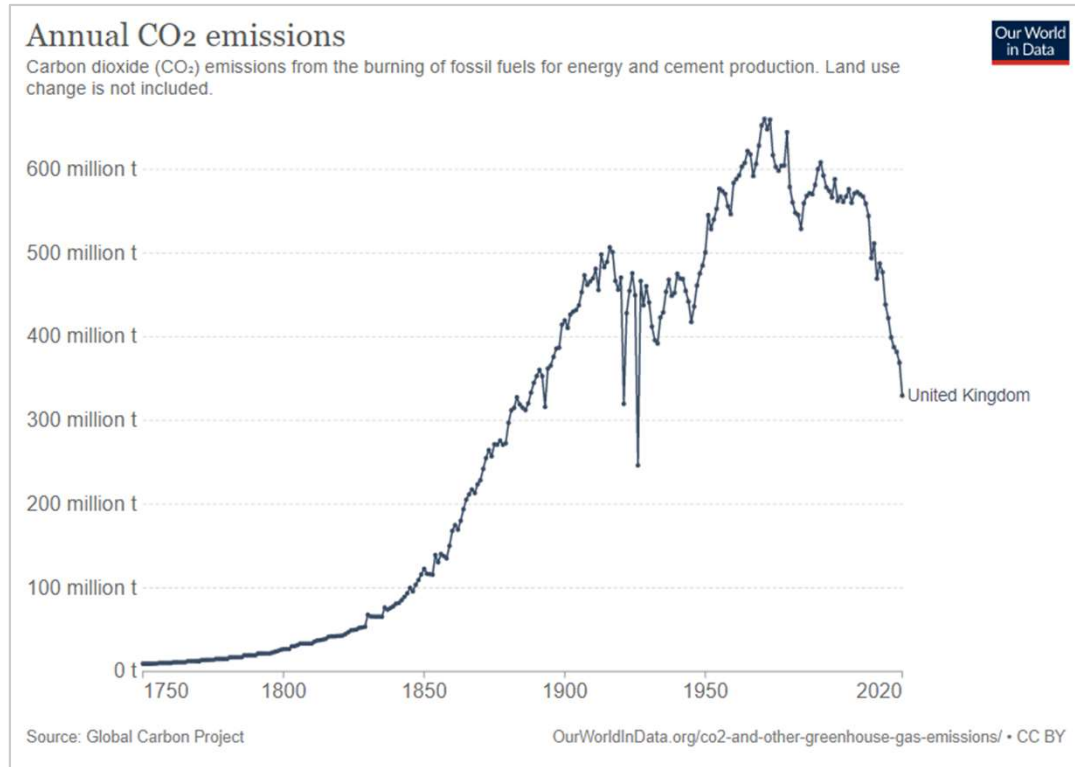


US lumber prices 2010-21

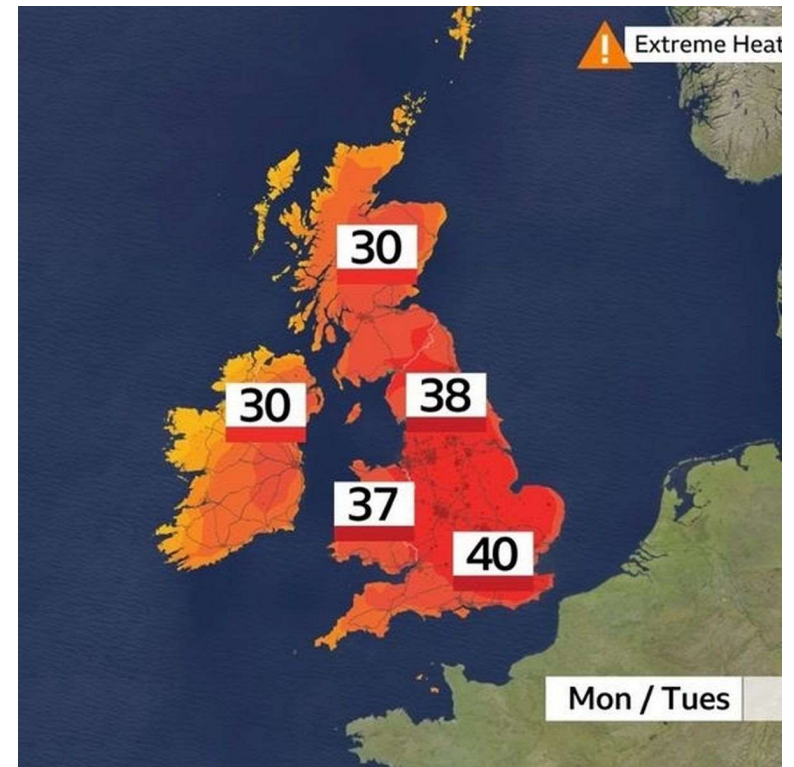


US steel prices 2020-21

Environmental standards



UK CO₂ emissions are falling

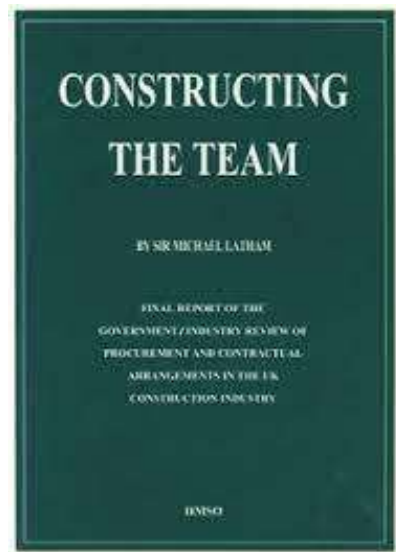


July 2022 saw the UK's hottest day on record

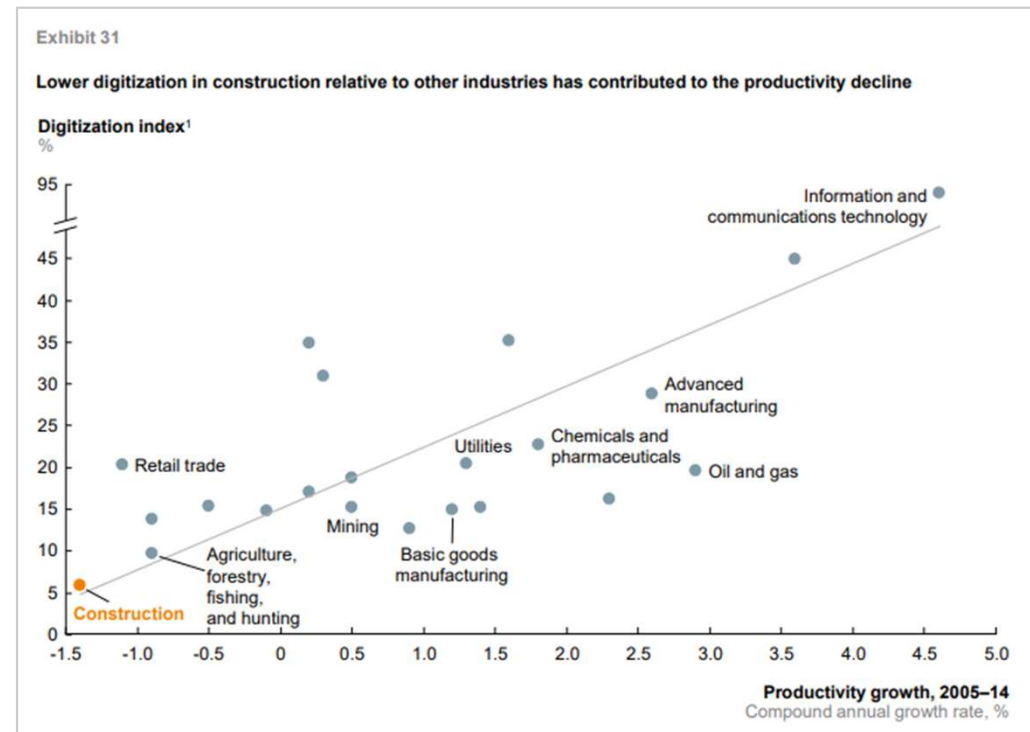
Remember the good old days?



The Egan Report



The Latham Report



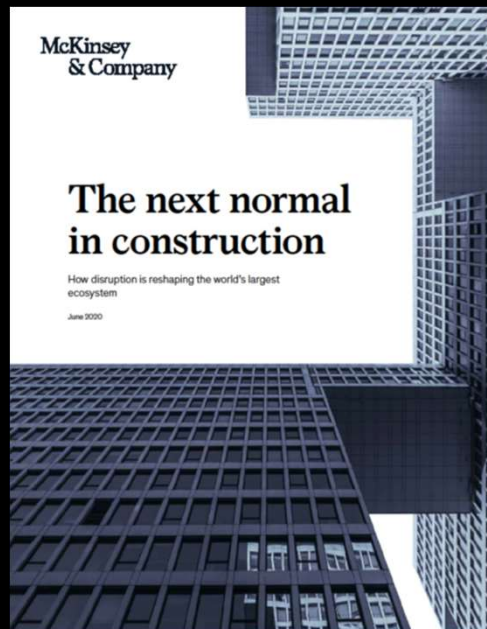
Is construction the least digitized industry?



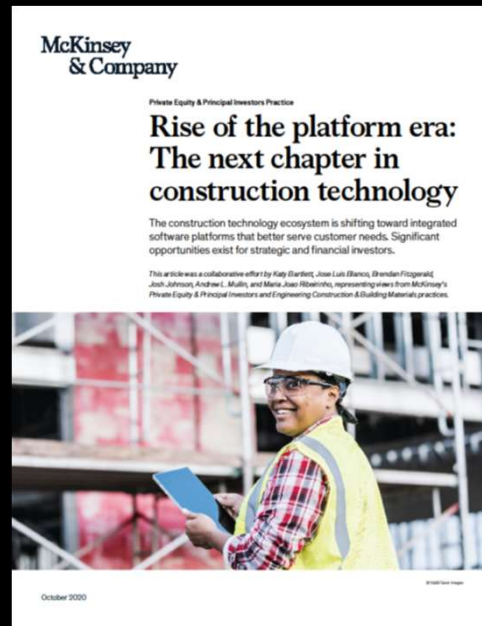
Permanent. Crisis.

...so what now?

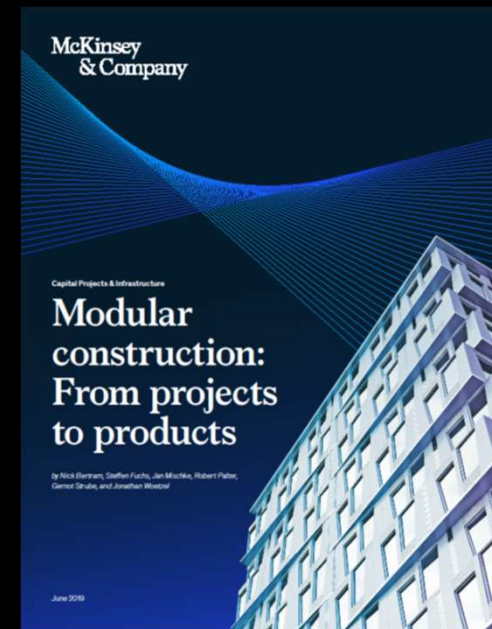
“Can technology save us from ourselves?”



June 2020



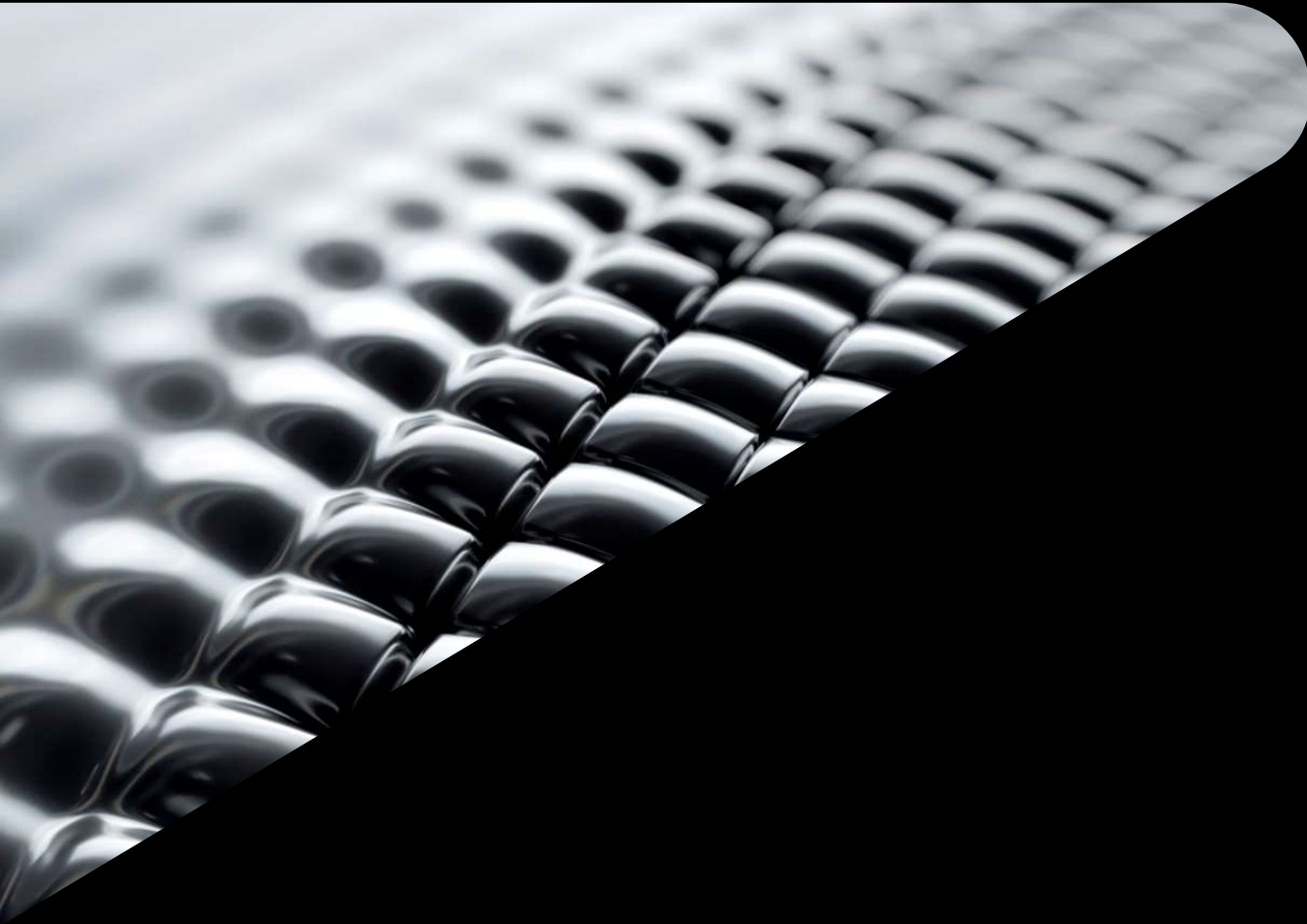
October 2020



June 2019

“Can technology save us from ourselves?”





Buildings as ~~Projects~~ Products

What do you mean?



MMC (Modern Methods of Construction)



Industrialized Construction



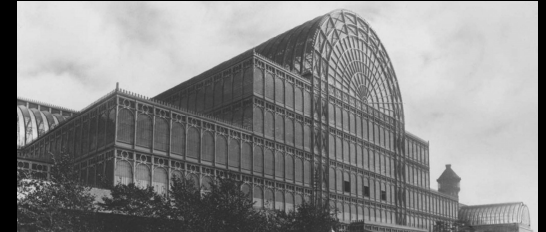
Modular

DfMA (Design for Manufacture & Assembly)

Prefab

Offsite Construction

Kit of Parts



The Crystal Palace, London

Ew, modular



Prefab post-war tower blocks

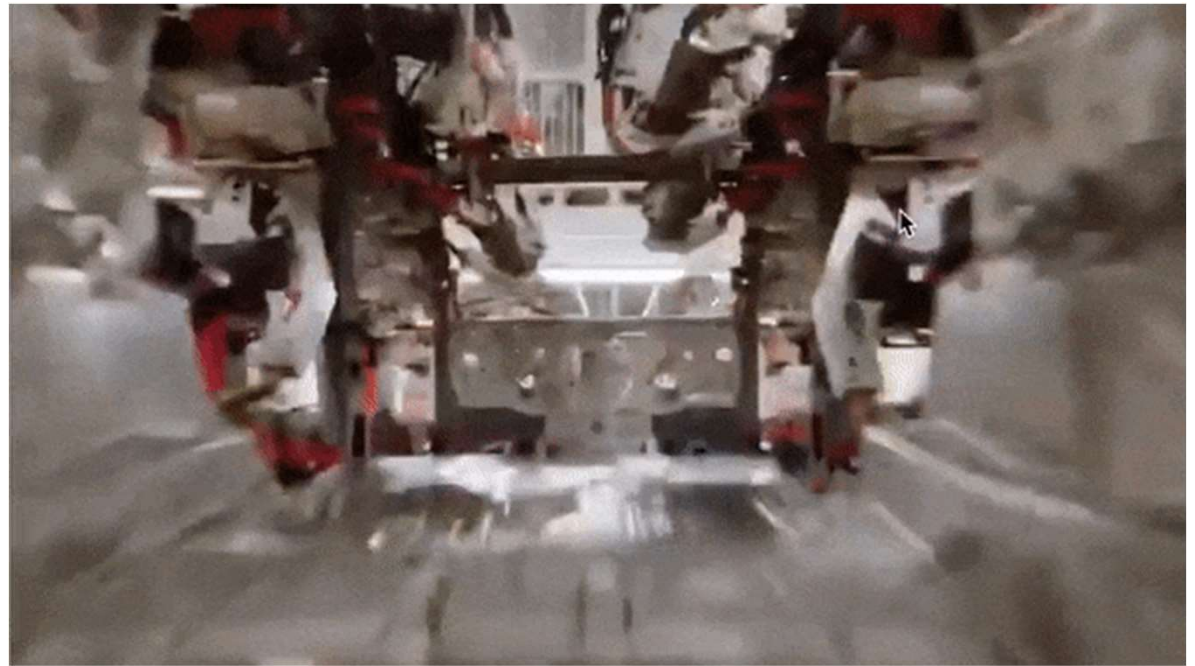


Manufactured homes

The big idea



Ford Model T production line

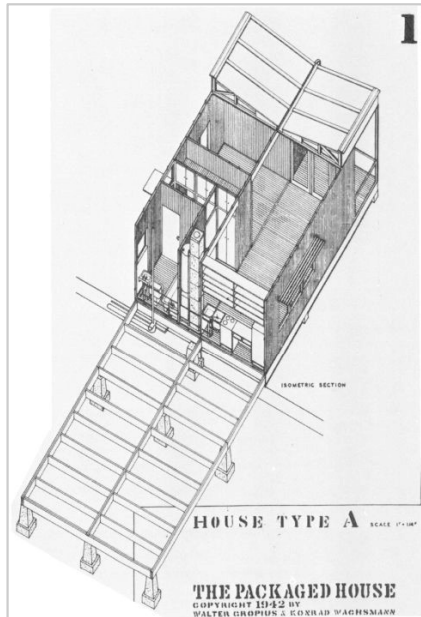


Giga Berlin

Do more, do it better, with less



Sounds familiar?



Gropius & Wachsmann 1942-52



Jean Prouvé 1944



Carl Koch 1957-67



Walter Segal 1962-70s



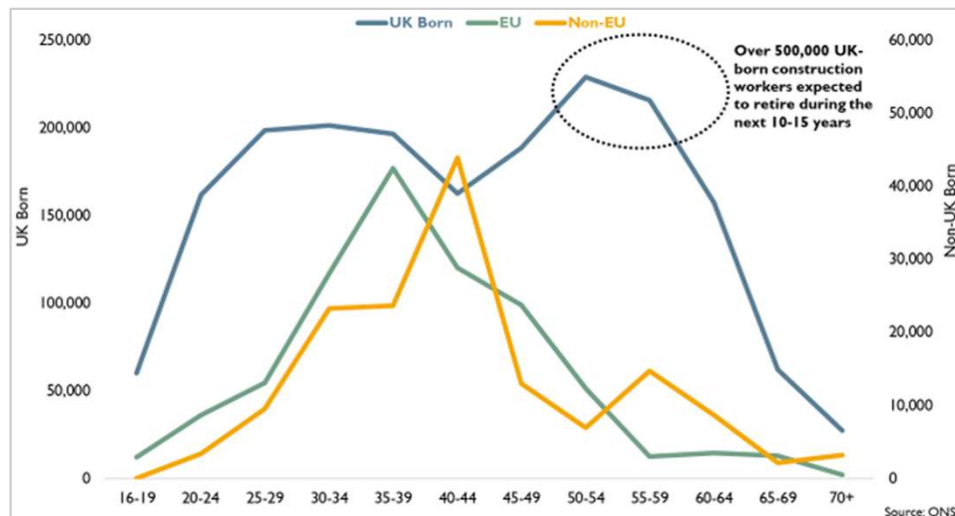
Portable Iron Houses (Australia c.1850)



Katerra 2015-2021

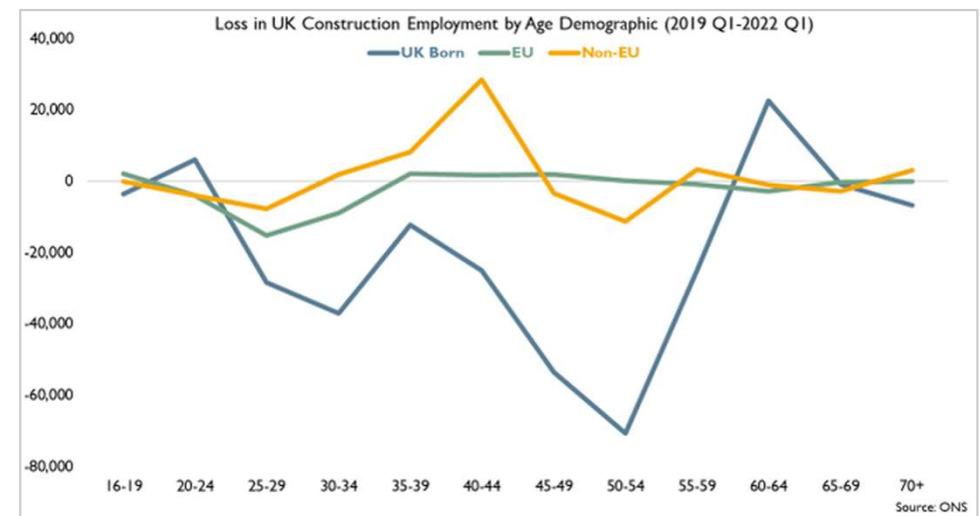
What's different this time?

Plan A is rapidly and irreversibly going out of the window.



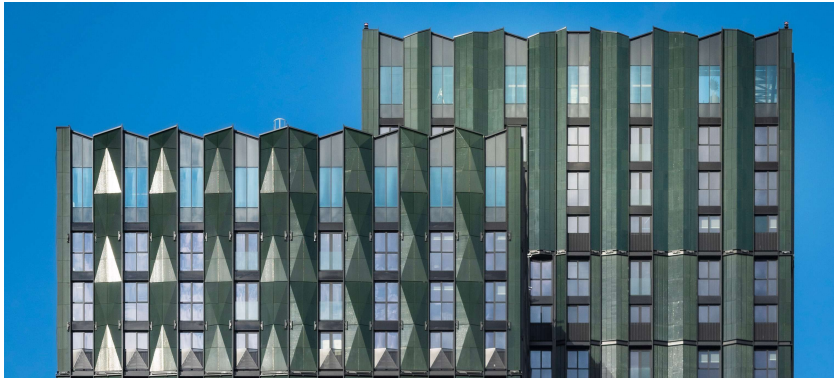
Many UK-born construction workers look set to retire

Graphics & analysis from @NobleFrancis (2022)



The great retirement (of our most experience workers) has already begun

The offsite island



- 🇹🇼 192m (630ft) – South Avenue Residences, under construction, 2023
- 🇬🇧 159m (520ft) - 30 Marsh Wall, received planning in 2022
- 🇬🇧 149m (489 ft) - College Road, Croydon, under construction 2023
- 🇬🇧 **135m (456ft) – Ten Degrees, Croydon, completed 2020 (pictured)**
- 🇹🇼 129m (425 ft) – Clement Canopy, Singapore, completed 2019
- 🇺🇸 109m (359ft) – 461 Dean Street, completed 2016
- 🇬🇧 103m (338ft) – Lewisham Exchange, Lewisham, completed 2021
- 🇬🇧 89m (293ft) – Mapleton Crescent, Wandsworth, completed 2018

Offsite construction factories in the UK



Researching the sector

Organisations

Library

Quotes

Events

Media

Inspo

Software

Projects

Locations

MMCSUBCategories

Extensions

Manage Fields

Views

All Organizations

55 hidden fields

Filter

Group

Sorted by 1 field

Color

Share view

Find a view

All Organizatio...

Outreach

Consultants

Governmental

Consultancy Firms

Research Bodies

Industry Associati...

Non-Profits

Training Bodies

Legal

Event Organizers ...

MMC Europe

MMC Cat 1

MMC Cat 2

MMC Cat 3

MMC Cat 5

MMC Cat 7

Developers

Tech Firms

Investors

Create...

A Name

Organization Type

Sub-Type

Website Address

CountriesOfOperation

Notes

129

Cole Waterhouse

Consultancy Legal

Development

Proprietary

https://colewaterhouse.co.uk/

We provide in-dept

130

Combilift

Manufacturers

Cat 7 (Site)

https://combilift.com/straddle-car...

131

Concrete Center

Industry Association

Concrete

https://www.concretecentre.com/

132

Connect Homes

Technology

Offsite Build

Cat 1 (Volumetric)

https://connect-homes.com

United States

Making modern livi

133

Connect Modular

Offsite Builders

Cat 1 (Volumetric)

http://connectmodular.co.uk/inde...

United Kingdom

134

Connex Offsite Limited

Manufacturers

Cat 5 (Components)

https://www.connexoffsite.com/

United Kingdom

135

Connolly Center for Modern Construct...

Training

MMC

Construction

https://bedfordcollegegroup.ac.u...

136

Considerate Constructors Scheme

Non-Profit

Regulatory

https://www.ccscheme.org.uk/

A not-for-profit, ind

137

Constructing Excellence

Industry Association

Construction

https://constructingexcellence.or...

Part of the BRE Gro

138

Constructing Modern Methods

Industry Association

MMC

https://www.constructingmodern...

CMM is the result o

139

Construction Industry Research and In...

Research Body

Construction

https://www.ciria.org/

Our vision is to be a

140

Construction Industry Training Board (...)

Industry Association

Training

https://www.citb.co.uk/

141

Construction Innovation Hub (CIH)

https://constructioninnovationhu...

142

Construction Leadership Council

Governmental

Non-Profit

Construction

https://www.constructionleadersh...

143

Construction Products Association

Industry Association

Manufacturing

https://www.constructionproduct...

The Construction Pr

144

Construction Scotland Innovation Cen...

Industry Association

Res

Manufacturing

https://www.cs-ic.org/

Our team assists inc

145

Constructional Timber

Offsite Builders

Cat 2 (Panelised)

Cs

https://www.constructionaltimber...

United Kingdom

146

Corehaus

Offsite Builders

Cat 1 (Volumetric)

https://www.corehaus.co.uk/

United Kingdom

Joint venture betw

147

Cottage

Offsite Builders

Cat 1 (Volumetric)

cotta.ge

United States

148

Countryside Timber Frame

Offsite Builders

Cat 2 (Panelised)

http://www.countrysideproperties...

United Kingdom

149

Cove

Technology

Construction

https://www.cove.tools

Intuitive web app fo

+ 626 records

The Marketplace Problem

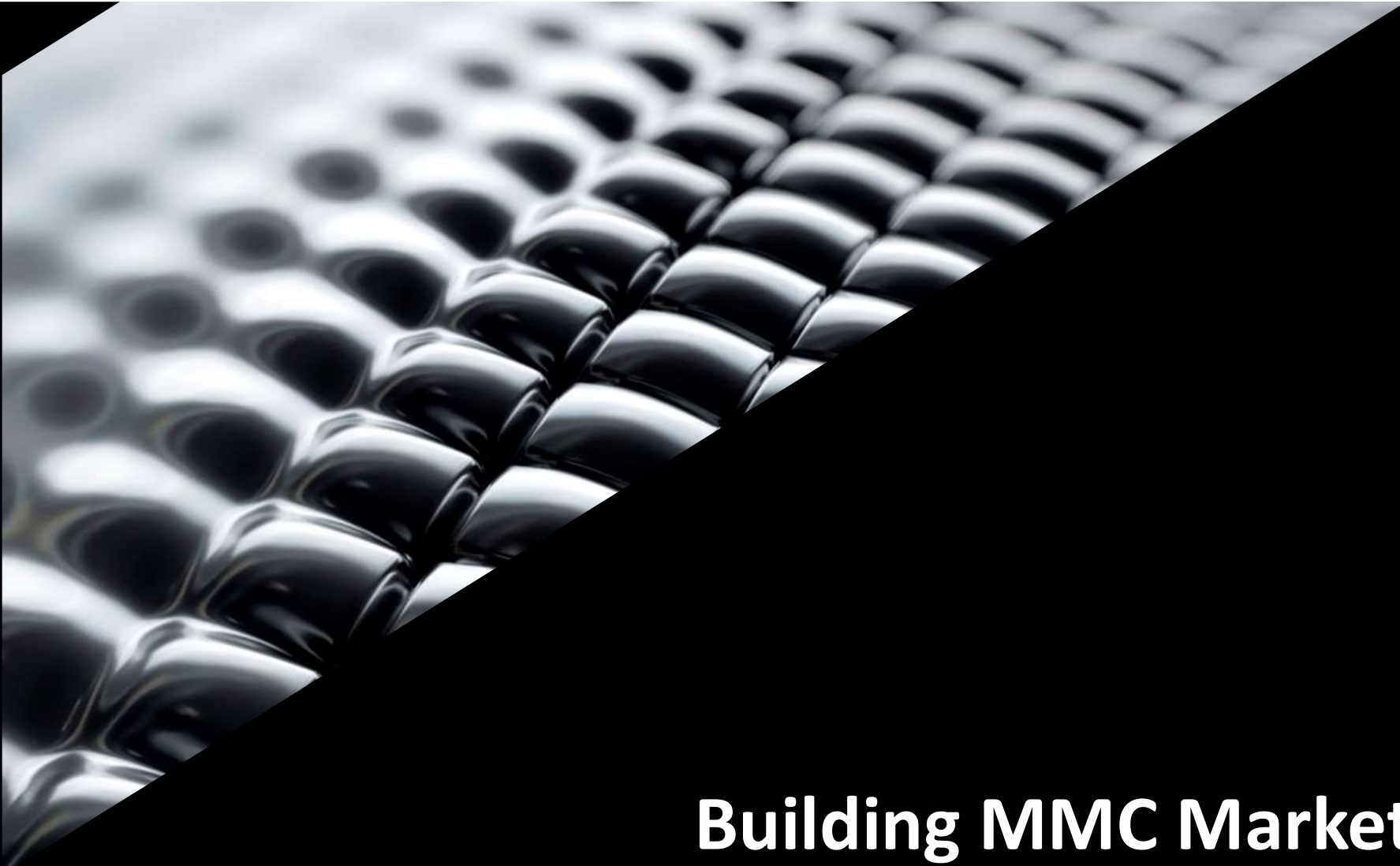
Bringing the buyers and sellers together – creating visibility into the market

“Interviewees suggested that the current modular market in London is seen as immature, and that **supply chain inefficiencies inhibit the development of a scalable business model.**”

“The construction sector does not share knowledge and expertise sufficiently which, **given the different supply chain relationships becomes more important in the OC sector** compared with traditional on-site construction.”

“**The lack of integration across the supply chain**, manifested in a wide-scale use of sub-contracting and tiered transactional interfaces is commonplace.”

“Many witnesses cited **the lack of established supply chain** as one of the largest barriers to greater uptake of MMC.”



Building MMC Market

Issues with existing databases



Paywalls

Most supply chain databases live as premium products behind paywalls, often behind lengthy registration processes. This commercial opacity is typical of the UK's construction sector and is something we're looking to challenge.



Lack of MMC Focus

There is a lack of databases targeted specifically at MMC categories and companies, and those that do such as the Kier and SCSS portal deliver poorly on that promise.



Lack of Oversight

Other than basic forms, there is no clear way for external parties to contribute to existing databases and no visibility on validation.



Critical Mass

A successful database will require critical mass. Once big enough it will generate its own network effect and self-sustain momentum. The NBS is closest to this, but looks specifically at product-level detail.



Technology / User Experience

All databases we reviewed lacked any consideration for modern technologies and UX. The need for registration, confirmation emails, closing cookie banners, newsletter popups and absence of adaptability across different devices was common place.



Trust

Trust in the data is important in an industry renowned for being risk-adverse. Inclusion of industry accreditations, whilst visibility in any validation process for inclusion will be key.

Issues with existing databases

Trust issues

MMC Manufacturers

- Cleanrooms
- Engineered Timber
- Infrastructure (Bridges, Gantries, ...
- Infrastructure (Bridges, Gantries,...
- Other
- Other Sub-assemblies / Compon...
- Other sub-assemblies / compone...
- Pod Technology (bathrooms, kitc...
- Precast Concrete
- Prefabricated MEP (Risers, Servic...
- Steel Framing Systems (Light Ga...
- Structural Insulated Panels (SIPS)
- Unitised Facades
- Volumetric (Modular)

Low quality data

Windows protected your PC

Microsoft Defender SmartScreen prevented an unrecognised app from starting. Running this app might put your PC at risk.

[More info](#)

DIRECTORY LISTING

- Company name
- Technology type(s)
- Full contact details
- Website link
- Company logo
- Description
- Functionality to upload your company literature, product images and to state your accreditation

£500 PERMANENT LISTING

Low quality UX

Paywalls

Registration walls

Pick an account

Selected user account does not exist in tenant 'London & Quadrant' and cannot access the application 'e19b2f18-ce9b-463d-b89c-c6e1e9dd3451' in that tenant. The account needs to be added as an external user in the tenant first. Please use a different account.

Ollie Green
ollie.green@kope.ai
Signed in

+ Use another account

Country

- ☐ Select all
- ☐ (Blank)
- ☐ Europe
- ☐ North America
- ☐ Portugal
- ☒ UK
- ☐ UK Turkey Germany Russia

No oversight of data

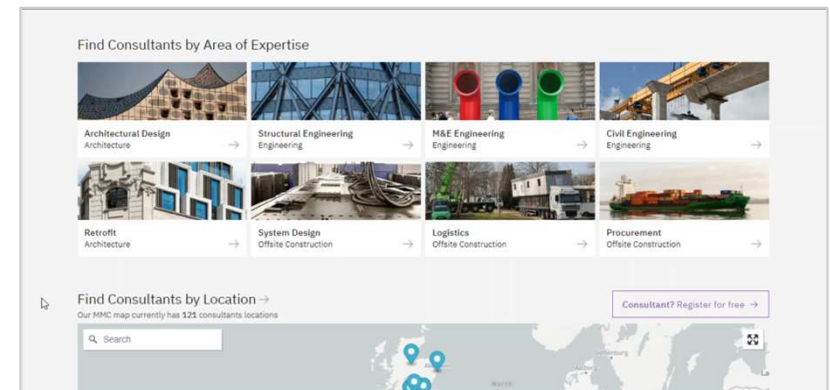
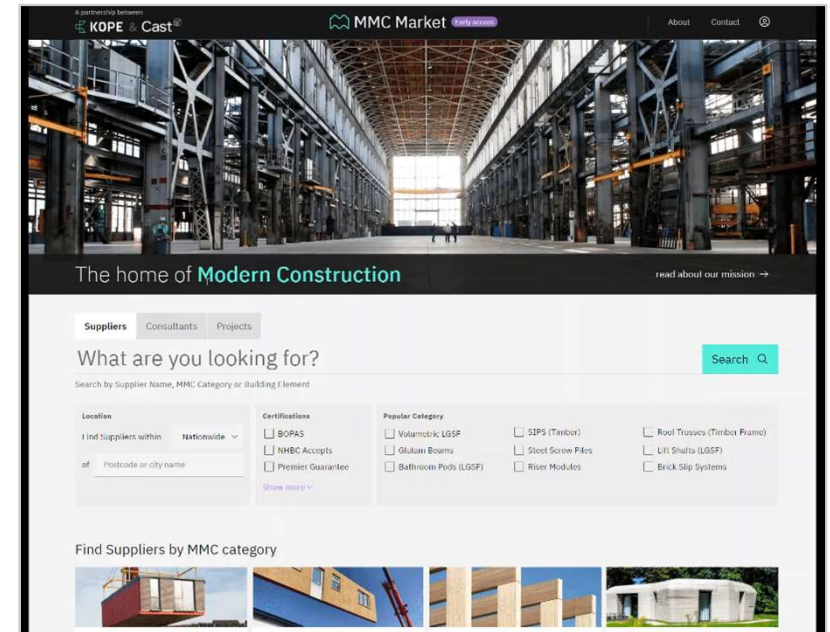
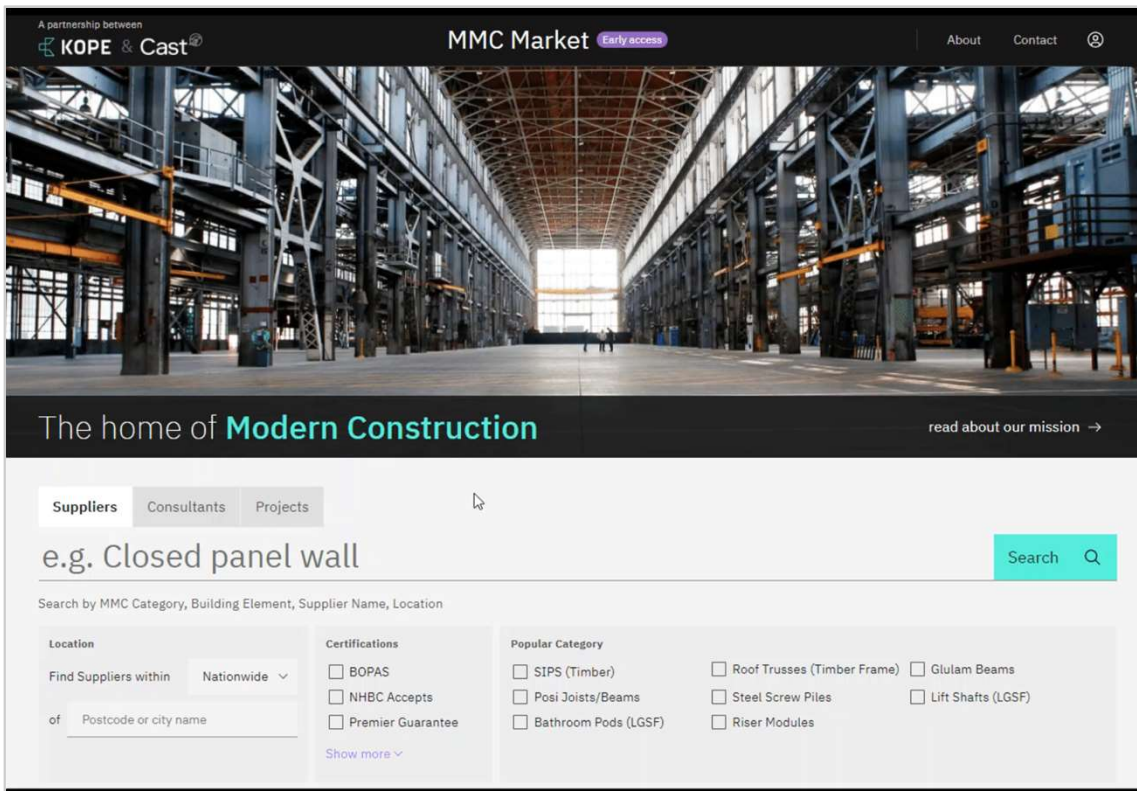
Challenges we faced

Building a marketplace has its own challenges:

1. You need a lot of high-quality data.
2. Create data models that are going to scale.
3. Gaining the trust of users.
4. Cultivating your intended audience.
5. Removing as much UX friction as possible.
6. Make it 'sticky'.

Six months later...

As of Mid August 2022 - 191 Suppliers, 151 Factories, 73 Consultants, 103 Projects



Expanding to products



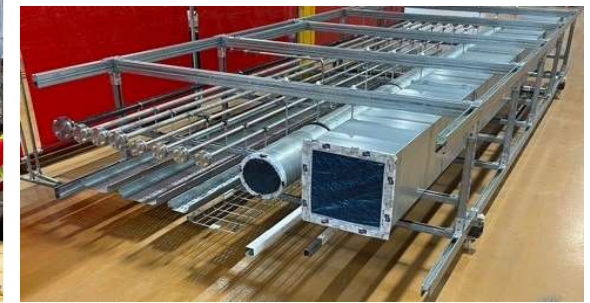
Volumetric modular

Floor cassettes



CLT panels

Bathroom pods

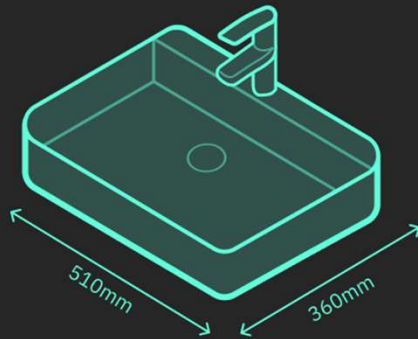


Pre-assembled plant modules

Product types

BOUGHT

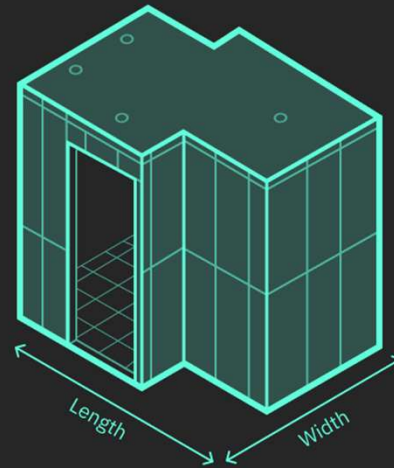
e.g. Kitchen Sink



Design is fixed.
Lives in a warehouse somewhere.

CONFIGURED

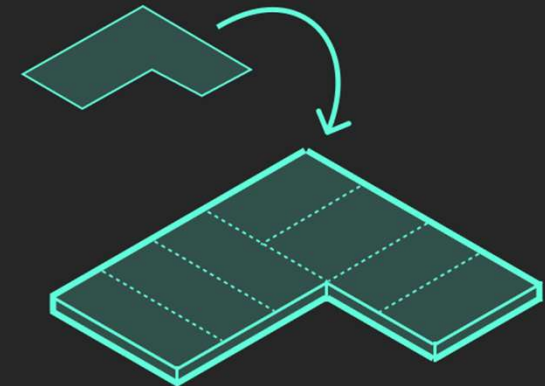
e.g. Bathroom Pod



Design system with flexing logic.
Made to order. Variation is minor.

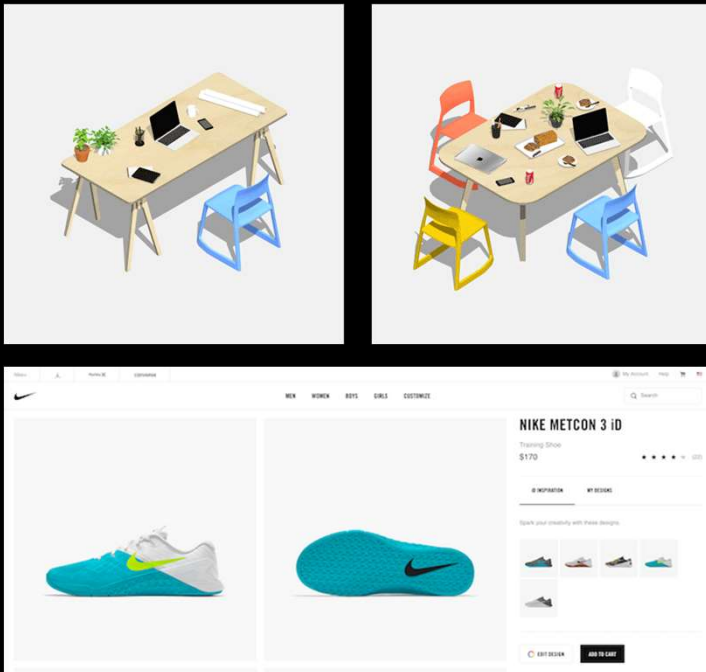
COMPUTED

e.g. Concrete Floor Planks



Computed from the ground up using
base geometry, e.g. plane or outlines.

Offsite = non-standard



Offsite construction systems are generally **made to order**.

Instead of a fixed design, the company has a design system, that lets them flexibly respond to specific project needs.

Offsite systems have their own **embedded logic** around how they can be configured, and how any changes affect the overall design.



How to build a marketplace of user-configurable systems?



Kit Of Parts Engine

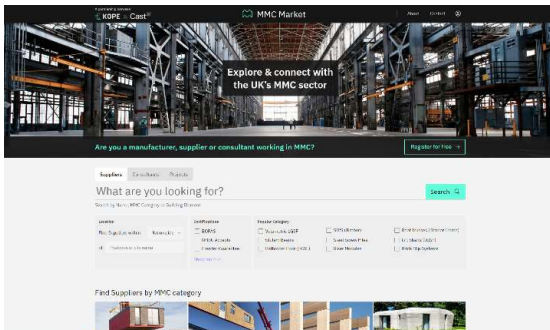


It's one thing to flex a product and see what variations you can use on your project.

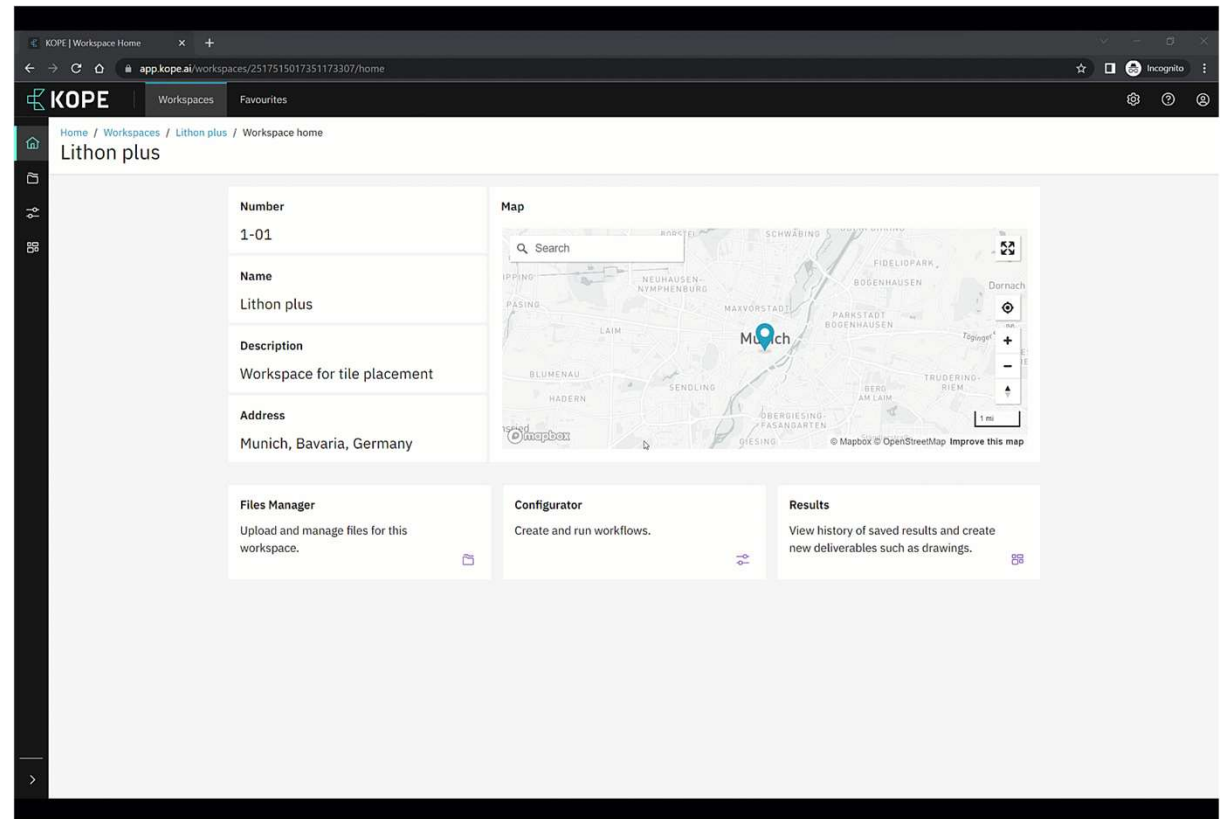
What we are building takes that to its logical endpoint; **Automated application of those products directly to design files.**

Allowing the implications of offsite to be seen and understood at any time.

The 'offsite' platform

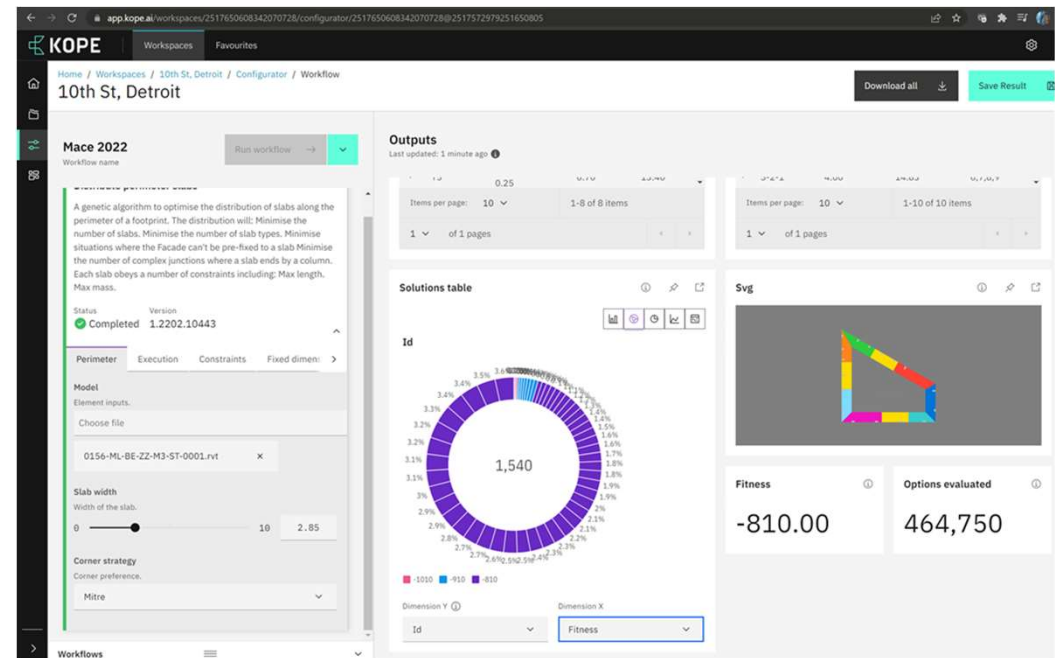
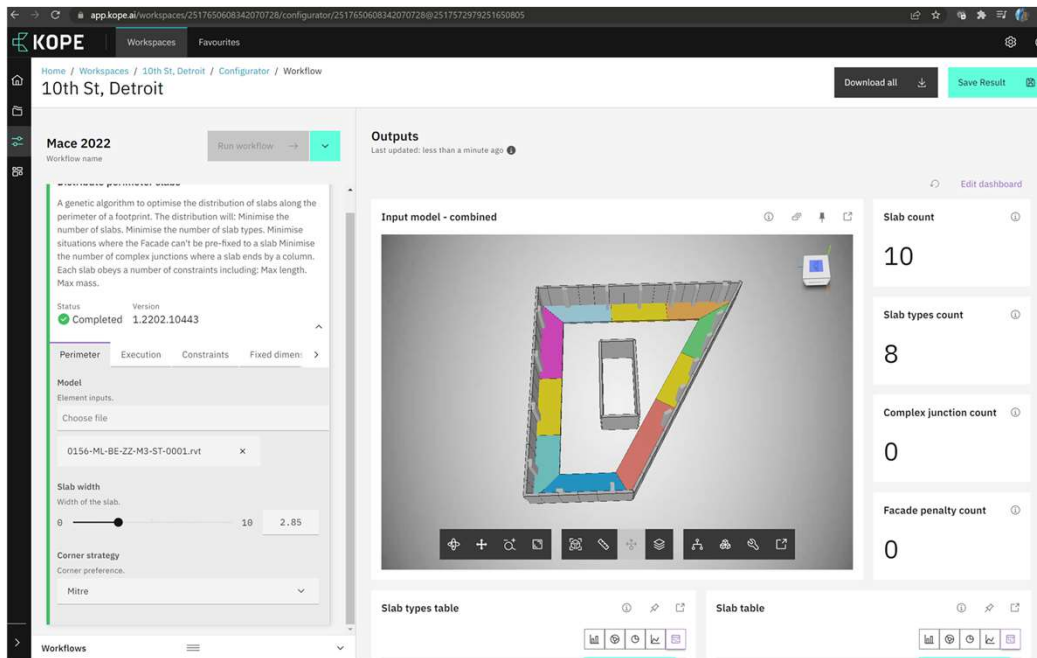


Marketplace



Web App

The webapp



Apply a product

Natural Building Systems

[See profile on MMC Market](#)

ADEPT System: Intermediate Floor Cassette

Suitable for buildings up to 18m in height, the ADEPT system is a fully integrated prefabricated...

Inputs

Calculated

Key Dimensions

Length (mm)
The overall length of the cassette.
600 2400 1800

Width (mm)
The overall width of the cassette.
600 600 600

Finishes

Top Finish
Chipboard

Bottom Finish
Chipboard

Download IFC Model

Powered by KOPE

Save Design

Download

Share

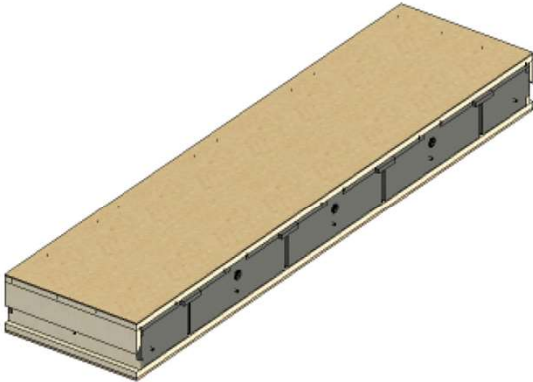
Collapse Panel

Version 1.04.01

Configurator Information

Version 1.04.01

Last Updated 23 April 2022



A partnership between

KOPE & Cast

MMC Market

AboutContact

Back to Innovare Systems

Floor Cassette (Posi-Joist)

by Innovare Systems

become increasingly popular because they can improve safety on site and process.

ther JJI-Joists or Posi-Joists™ to meet customer requirements.

[Read more](#)

Part E: Resistance to Sound

Configure

Basic Information

Supplier page [www.innovaresyste...](#)

Used in Floors

MMC Category 2: 2D Structural Systems

Documents

[Product Data Sheet \(1.4MB\)](#)

Product Certifications

[NHBC Accepts \(0.12MB\)](#)

[BOPAS](#)

Connect with us

Copyright Notice 2022

Apply a product

Browser tabs: New Tab, x, +

Search Google or type a URL

Apps BIM360 Cloud QA... matterlab | Archive... Jacobs DesignCompute Artelia SharePoint

KOPE Workspaces Favourites

Back to home / Workspaces/ ILKEGF01-VT Ground Floor Module 01
ILKEGF01-VT Ground Floor Module 01 Factory 03 QA passed

Default study Add Workflow +

Posi-joist
Slab review 1

Status: Running Inputs: 5 Outputs: 3

Model elem... Constraints Dimensions ...

Minimum Panel Width: 800

Maximum Panel Width: 1000

Panel Height: 1500

Select File: 1: Steel Frame v1 +

Setting-out Point: Add point

Point(X = 565.0, Y = 330, Z = 0.0) x

ADEPT System

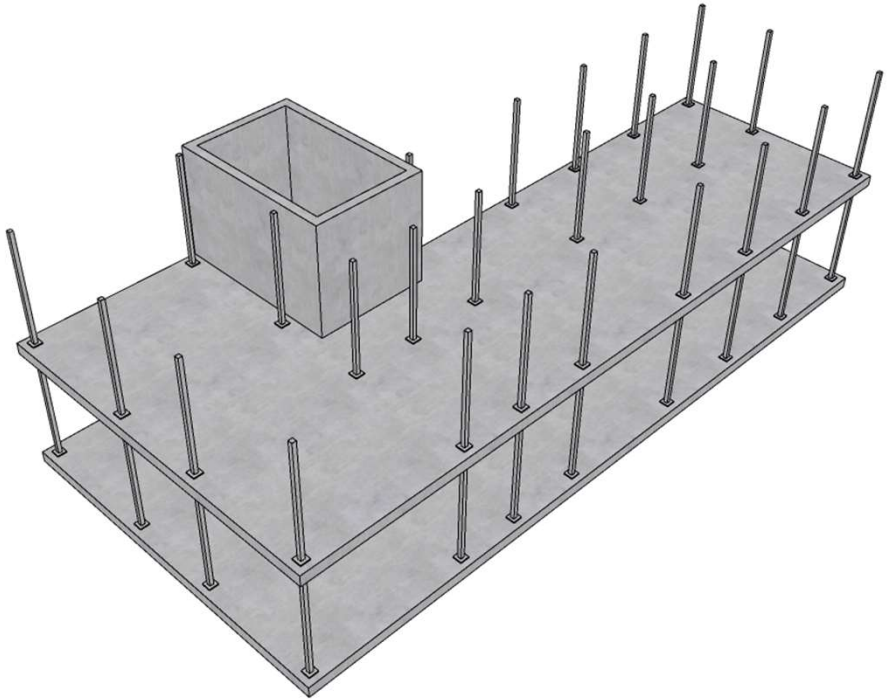
Outputs

Filters: Reset all

Output Type: All

Source workflow: All

Option selected: no options available Show options panel



Studies Options

Apply a product

Browser window showing the KOPE application interface.

Navigation Bar: KOPE | Workspaces | Favourites

Breadcrumbs: Back to home / Workspaces / ILKEGF01-VT Ground Floor Module 01

Buttons: Factory 03 | QA passed

Default study: Add Workflow +

Posi-joist Slab review 1

Status: Running | Inputs: 5 | Outputs: 3

Model elem... | Constraints | Dimensions | ...

Minimum Panel Width: 800

Maximum Panel Width: 1000

Panel Height: 1500

Select File: 1: Steel Frame v1

Setting-out Point: Add point

Point(X = 565.0, Y = 330, Z = 0.0) x

Outputs:

Filters: Reset all

Output Type: All

Source workflow: All

Option selected: no options available | Show options panel

3D Visualization: A 3D model of a building structure, showing a concrete slab with a grid of vertical reinforcement bars (rebar) and a central rectangular void.

Studies: ADEPT System

Options:

Apply a product

Natural Building Systems
See profile on MMC Market →

ADEPT System: Intermediate Floor Cassette
Suitable for buildings up to 18m in height, the ADEPT system is a fully integrated prefabricated...

Inputs	Calculated	CF	I
Key Dimensions			
Length (mm) The overall length of the cassette.			
600	2400	5800	
Width (mm) The overall width of the cassette.			
600	600	600	
Finishes			
Top Finish Chipboard			
Bottom Finish Chipboard			
Download BFC Model			
Powered by KOPE			



New Tab x +

Search Google or type a URL

Apps BIM360 Cloud QA... matterlab | Archive... Jacobs DesignCompute Artelia SharePoint

KOPE Workspaces Favourites

Back to home / Workspaces/ ILKEGF01-VT Ground Floor Module 01
ILKEGF01-VT Ground Floor Module 01 Factory 03 QA passed

Default study Add Workflow +

Posi-joist review 1

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5 3

Panel Width

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Point(X = 565.0, Y = 330, Z = 0.0) x

ADEPT System

Outputs

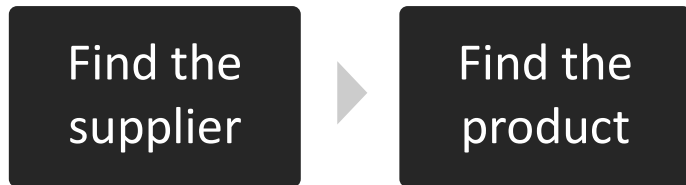
Filters Reset all

Output Type All

Source workflow All

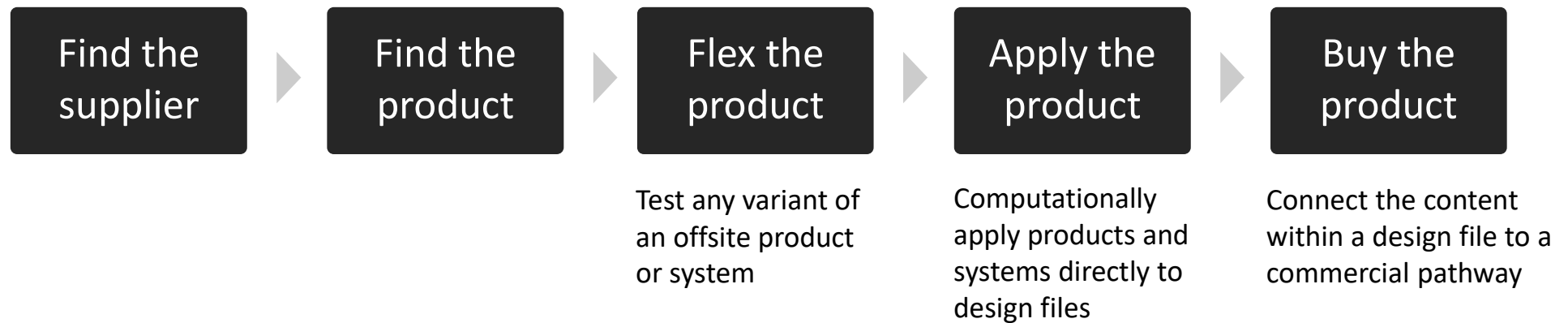
Option selected no options available Show options panel

Our vision

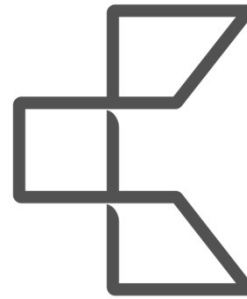
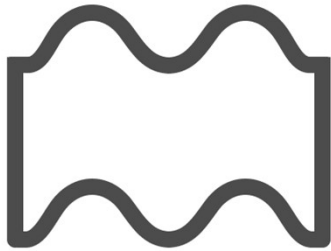


A marketplace where designers, procurers and specialists can find the right supplier and product in the easiest way possible.

Our vision



Our vision



Find the
supplier



Find the
product



Flex the
product



Apply the
product



Buy the
product

Where KOPE helps



Offsite Builders

Enable effortless communication between designers, material suppliers and in-house manufacturing teams. Automate manufacturing data from designs.



Manufacturers

Unlock new value by providing live cost, spec, availability and logistics data to the industry. Expand product offerings and take orders directly.



Designers

Understand how your design impacts constructability when using Offsite Construction principles and products.



Contractors

Easily evaluate and integrate Offsite Construction into new or existing projects. Expand captured value with new business offerings in the Offsite segment.



Design to constructability.

www.mmc.market

www.kope.ai

Do you work for a contractor, an offsite builder, a manufacturer or designer? We have limited availability to join our programs below.

Contact us at info@kope.ai



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