

Empowering the transition to Industrialized Construction

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Founder & CEO, Manufacton



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Construction technologist for 30+ years, including 8 years at Autodesk as senior construction strategist bringing BIM into construction with Revit, Navisworks and BIM 360. 10 years at Intel as industrial engineer & technologist for construction, manufacturing, materials & operations. 2 previous startups – VisionPlanner (founder) & Inquest Technologies (managing director). Advisor to CIFE, Stanford University.

The Offsite Construction Platform

Prefab-ES

Prefab Execution System

Mod-ES

Modular Execution System

Proj-ES

Project Execution System



Production Management



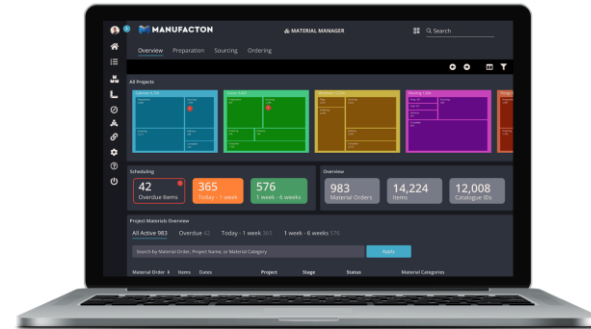
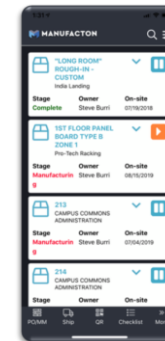
Material Management



Inventory Management



Supply Chain Management



Why move to Industrialized Construction?



*McKinsey Modular Construction Report (2019)



Lower Project Costs (20%*)

- Improve/retain margins



Reduce Schedule Time (50%*)

- Improve cash flow
- Real time view of “earned value”



Improve Resource Recruiting

- Fab vs. Field interests



Increase Productivity

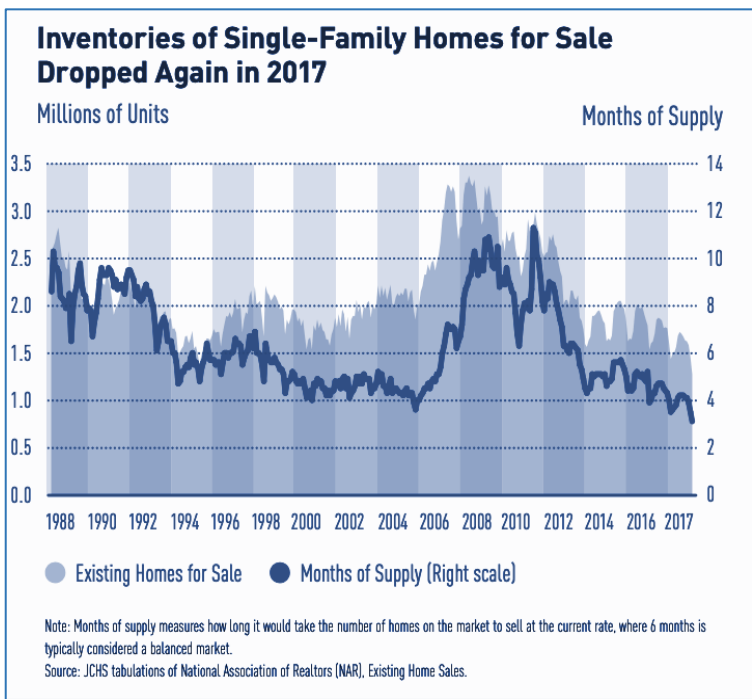
- Metrics (quantity, hours and \$...)
- Baseline, benchmark and improve



Improve Quality & Safety

- Controlled environment

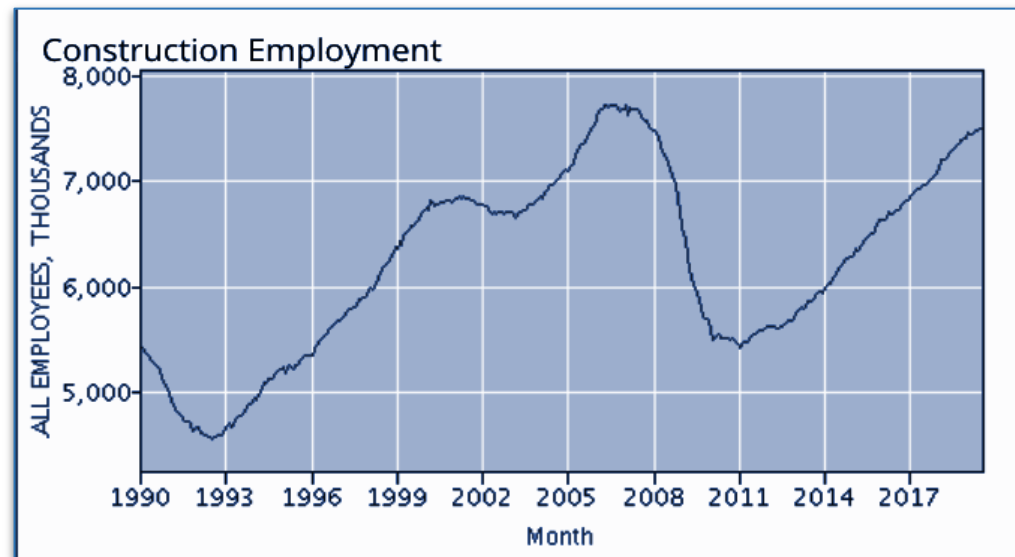




Housing Shortage

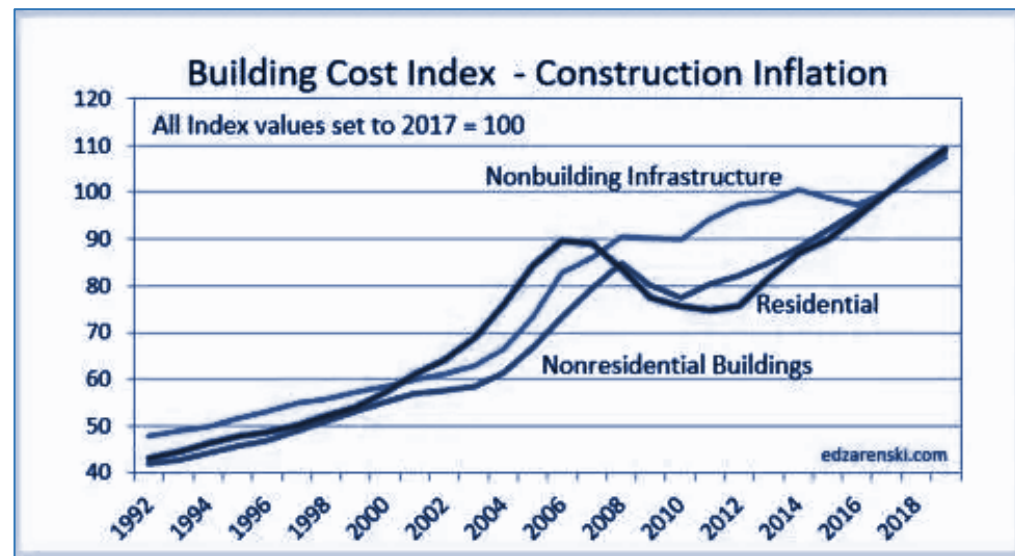
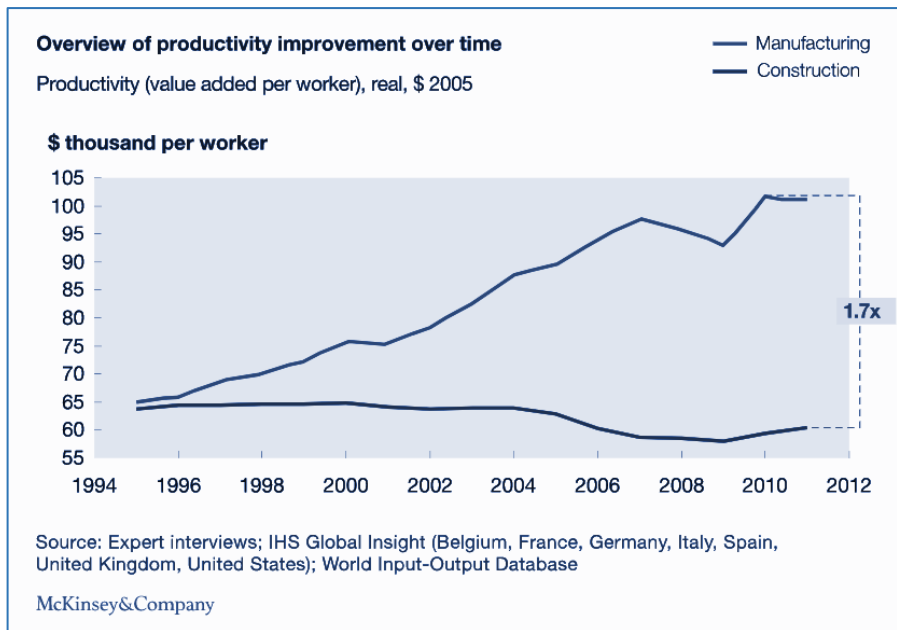
Workforce Shortage

Why now?



Stagnant Productivity

Increased Cost





Tipping point for Industrialized Construction?

Construction is moving from Field to Factory

Mechanical Contractor



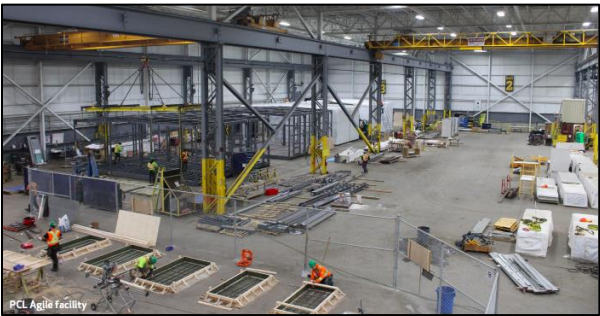
Electrical Contractor



Skender



CONSTRUCTION



MANUFACTON

DESIGN – MANUFACTURING – CONSTRUCTION



General Contractor



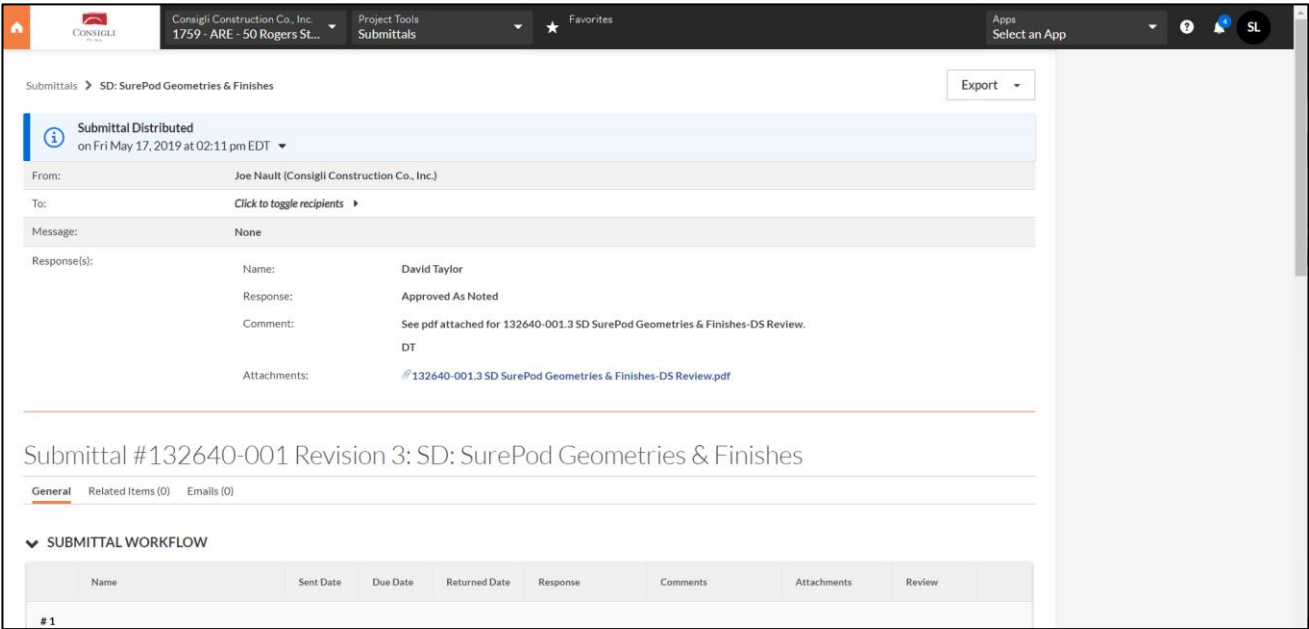
Factory_OS

Modular Builder

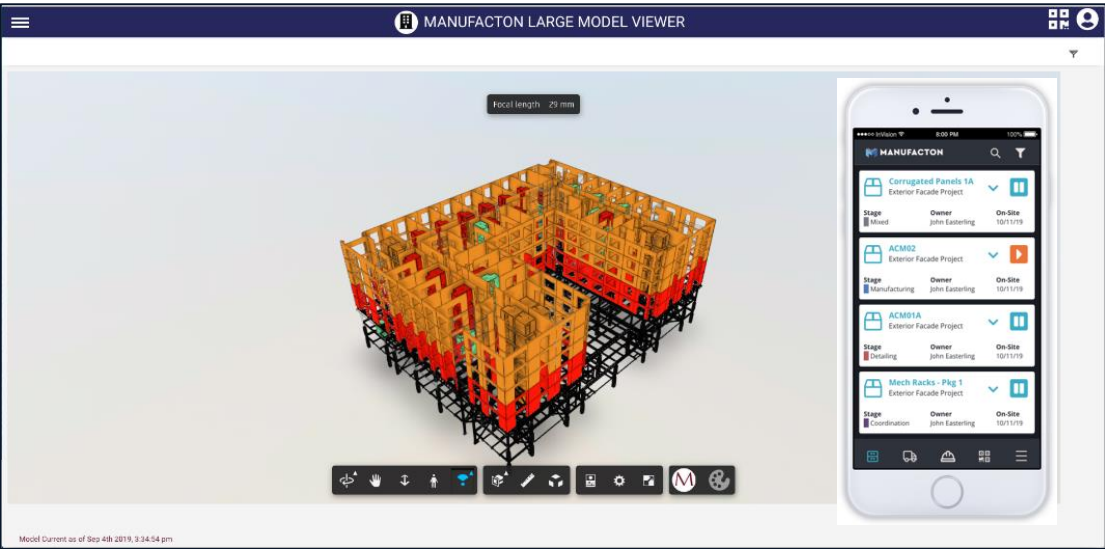


Jobsite is Assembly Plant with coordinated Supply Chain

50 Rogers, Cambridge MA



Coordinated Model



Production Status

Name	Notes	Project	Stage	Onsite	% Items	Actions
Type A100 - L45		50 Rogers - Pods	Delivery	12/09/2019	100%	[Icons]
Type B200 - L45		50 Rogers - Pods	Qc	12/09/2019	100%	[Icons]
Type C300 - L45		50 Rogers - Pods	Manufacturing	12/09/2019	0%	[Icons]
Type D400 - L45		50 Rogers - Pods	Manufacturing	12/09/2019	0%	[Icons]
Type E500 - L45		50 Rogers - Pods	Manufacturing	12/09/2019	0%	[Icons]

Delivery Status

Name	Status	Project	Delivery Loc	Ship	Deliver	Onsite(Final)	Actions
Type A100 - L3N	Complete	50 Rogers - Pods	Job Site	09/25/2019	10/16/2019	11/01/2019	[Icons]
Type A100 - L3S	Complete	50 Rogers - Pods	Job Site	09/25/2019	10/24/2019	11/07/2019	[Icons]
Type A100 - L4N	In-Transit	50 Rogers - Pods	Job Site	09/25/2019	11/19/2019	12/03/2019	[Icons]
Type A100 - L4S	In-Transit	50 Rogers - Pods	Job Site	09/25/2019	11/25/2019	12/09/2019	[Icons]
Type A100 - L5N	In-Transit	50 Rogers - Pods	Job Site	09/25/2019	12/20/2019	01/03/2020	[Icons]
Type A100 - L5S	In-Transit	50 Rogers - Pods	Job Site	09/25/2019	12/26/2019	01/09/2020	[Icons]



Progression For Industrialized Construction

PHASE 1

Move construction from field to factory

PHASE 2

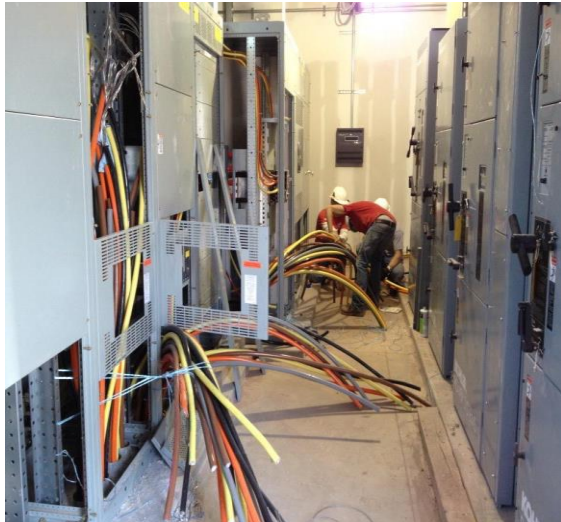
Organize production stations into assembly line

PHASE 3

Adopt advanced materials; break from constraints with stick build

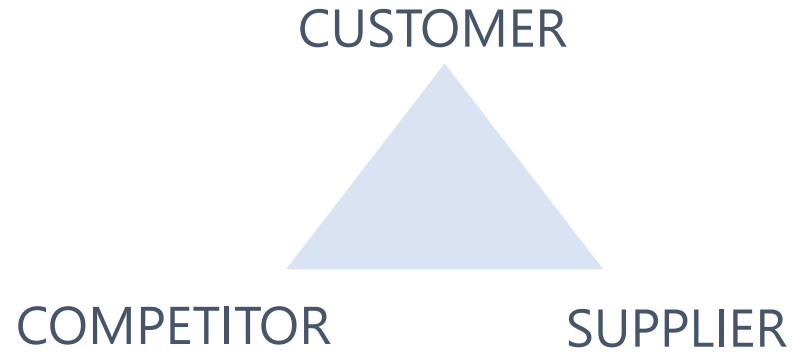
PHASE 4

Adopt advanced manufacturing techniques using robotics, 3D printing



New Business Models, Metrics & Mindset

Relationships



Capital



CAPACITY



BACKLOG



UTILIZATION

Operations



PRODUCTIVITY



EFFICIENCY



LEAN



QUALITY



SAFETY



CONTINUOUS
IMPROVEMENT

Industrialized Construction with Manufacton

Design

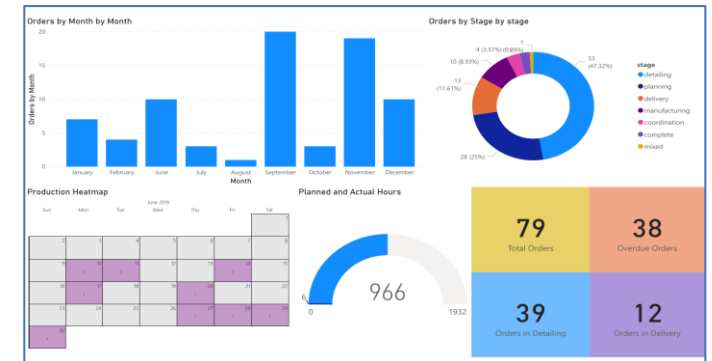
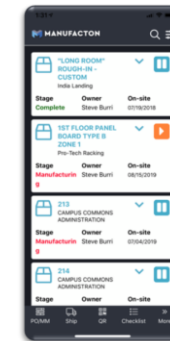
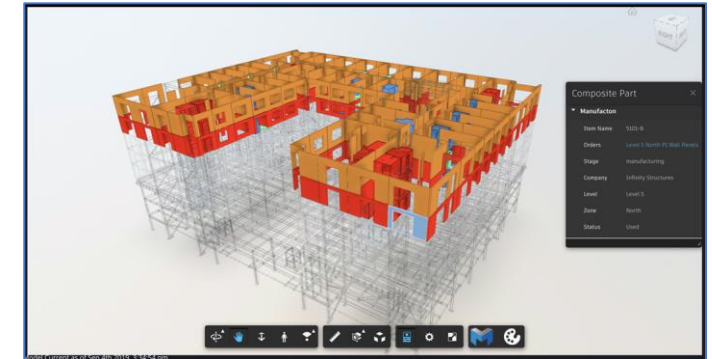
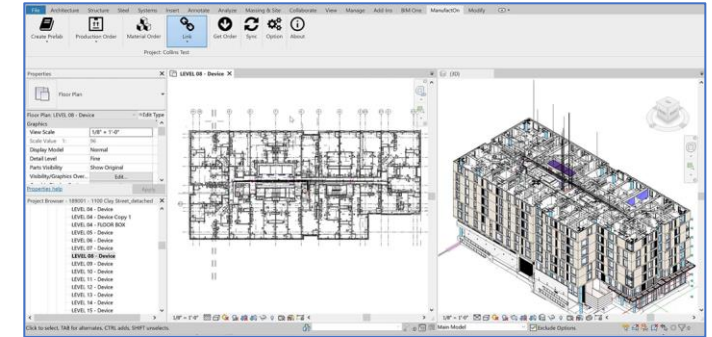
- Kit of Parts, product catalog and process templates
- BIM to production and installation, bill of materials (BOM)
- Schedule pull plan and design backlog

Manufacturing

- Agile production plan and manufacturing backlog
- Materials reservation and consumption
- Inventory – materials, components, assemblies, modules
- TQM – inline production QC and final inspection

Construction

- Shipping/logistics of materials and prefab components
- Site readiness and real-time supply chain status
- Installation sequence, field requests and final QC
- Turnover verification and document consolidation





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