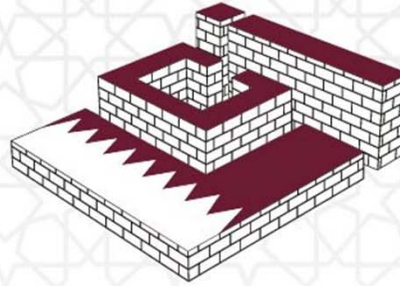


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Transforming the Built Environment



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Webinar Facilitator



Introduction to Lean Construction: How Lean Construction can Benefit you During COVID-19 crisis?



James Johnston, P. Eng., CM-Lean
President of Quality Dynamics Inc.

Join LCI-Qatar today at: <https://lci.qa/membership/>

Date: April 12, 2020 | Time: 6:30 - 7:30 PM

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Who Am I

- ▶ Professional Industrial Engineer & CM–Lean
- ▶ 25 years as a productivity consultant & trainer
- ▶ Accredited instructor – AGC of America’s Lean Construction Education Program
- ▶ Coach project teams & deliver Lean Construction workshops across Canada

Poll Number 1

▶ What's your role?

- Client – Government
- Client – Private
- Consultant (designer, supervision, and PM/CM)
- Contractor / Subcontractor
- Supplier
- Academic
- Researcher
- Student

Is This Reality?

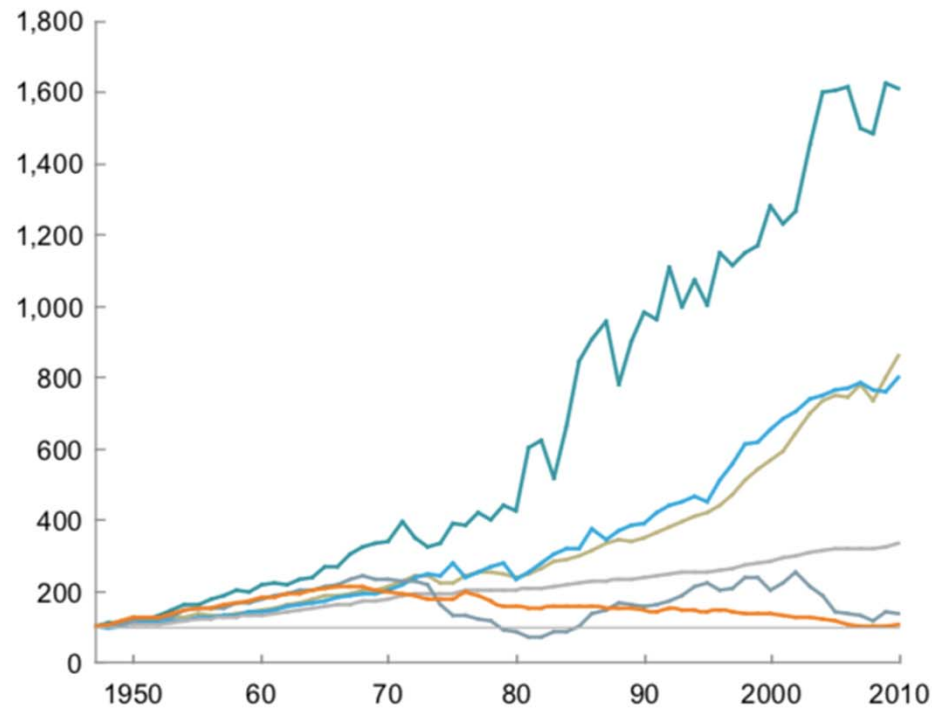


Why Lean Construction??

What We've Been Doing Doesn't Work

Gross value added per hour worked, constant prices

Index: 100 = 1947



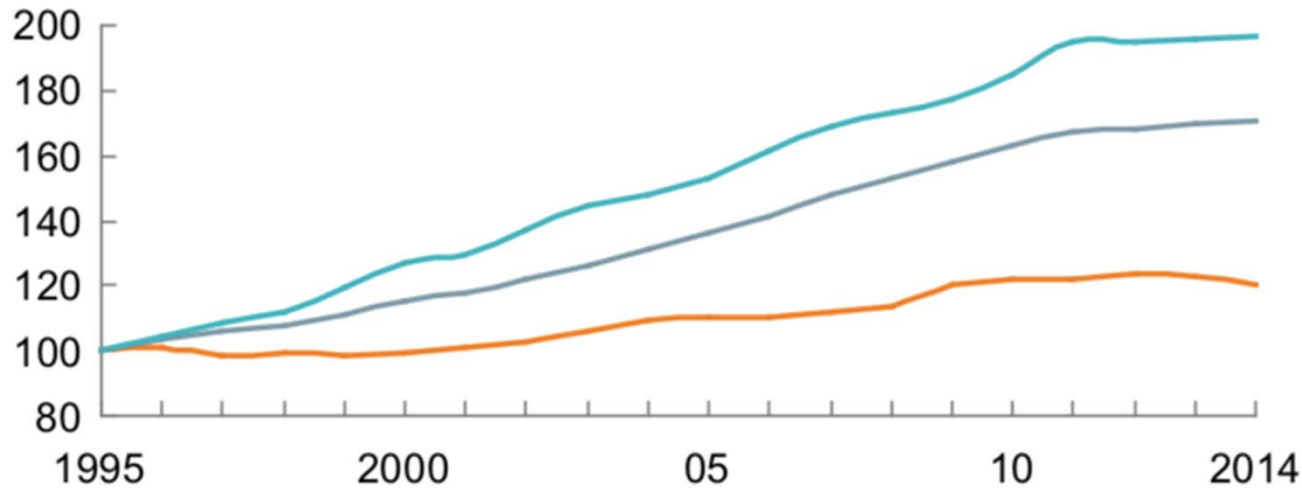
	Compound annual growth rate, 1947-2010 %	Total change
— Agriculture	4.5	16.1x
— Manufacturing	3.5	8.6x
— Wholesale and retail	3.4	8.0x
— Overall economy	1.9	3.3x
— Mining	0.5	1.4x
— Construction	0.1	1.1x

Why Lean Construction??

What We've Been Doing Doesn't Work

**Real gross value added per hour worked
by persons engaged, 2005 \$**

Index: 100 = 1995



1 Based on a sample of 41 countries that generate 96% of global GDP.

Quality Dynamics Inc.

Construction Total economy Manufacturing

Poll Number 2

- ▶ **Poll No. 2 Are you satisfied with the available tools and techniques to manage and execute projects?**
 - yes
 - No

- ▶ **Have the progress of your projects been impacted by COVID-19 outbreak?**
 - Not at all
 - Yes, Positively
 - Yes, Negatively (Minor)
 - Yes, Negatively (Moderate)
 - Yes, Negatively (Major)
 - Yes, Negatively (Extreme)

Why Lean Construction??

‘Traditional’ Delivery Outcomes...

-  Risk is high.
-  Most projects are delivered late.
-  Most projects are over budget.
-  Rework and waste is high.
-  Teamwork is unreliable.
-  Customers are not satisfied.
-  Profit margins are shrinking.

What is Lean?

- ▶ ‘Lean’ – a term that described the waste mitigation work done by Toyota
- ▶ Focused on maximizing value, attacking variation & waste and continuously improvement.

What is Lean Construction?

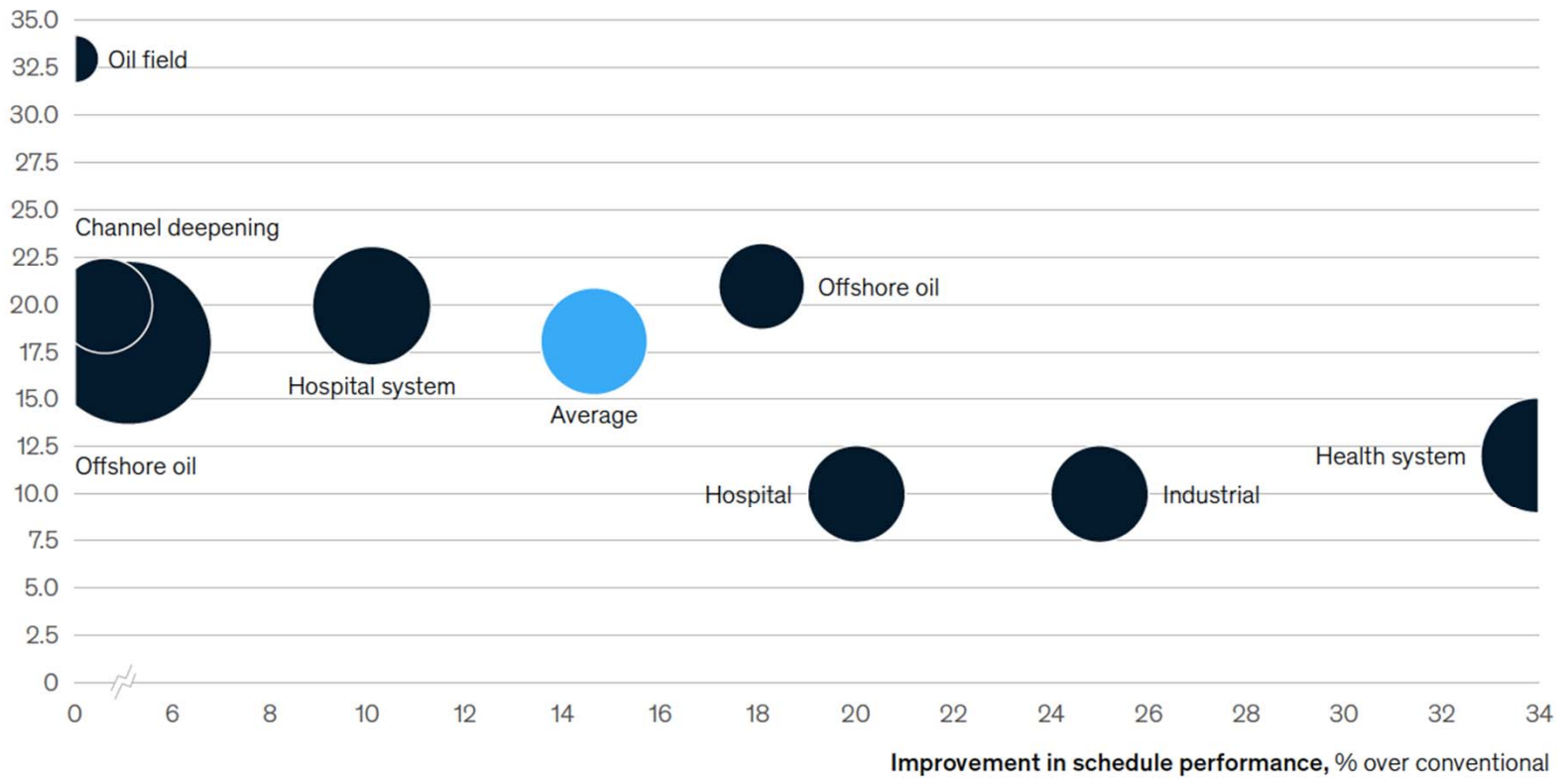
- ▶ Tools to facilitate planning and control, maximize value and minimize waste throughout construction.
- ▶ Goal is to eliminate work waiting for workers and workers waiting for work
- ▶ Must focus on smooth, reliable and predictable workflow.

Impact of Lean

Early adopters of collaborative contracts are seeing improvements in performance.

Improvement in cost performance, % over conventional

● Type of projects ● Average performance of early adopters



Polls Number 3

- ▶ **What is the success rate of your project in terms of achieving time, cost, scope, and client satisfaction?**
 - More than 95%
 - (75 – 94.99) %
 - (55 – 74.99) %
 - (10 – 54.99) %
 - Below 10%

- ▶ **How many times has your baseline schedule been revised or expected to be revised in a single mega-project?**
 - 1
 - 2
 - 3
 - 4
 - More than 5

Polls Number 3 con't

- ▶ **What percentage of your projects is the schedule revised or expected to be revised?**
 - Never
 - less than 9.99%
 - (10 – 29.99) %
 - (30 – 59.99) %
 - (60 – 89.99) %
 - (90 – 99.99) %
 - 100%

Waste – What is it?



Defects

Efforts caused by rework, scrap, and incorrect information.



Overproduction

Production that is more than needed or before it is needed.



Waiting

Wasted time waiting for the next step in a process.



Non-Utilized Talent

Underutilizing people's talents, skills, & knowledge.



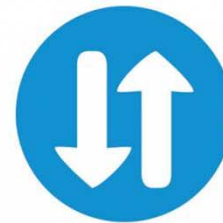
Transportation

Unnecessary movements of products & materials.



Inventory

Excess products and materials being processed.



Motion

Unnecessary movements by people (e.g. walking).



Extra-Processing

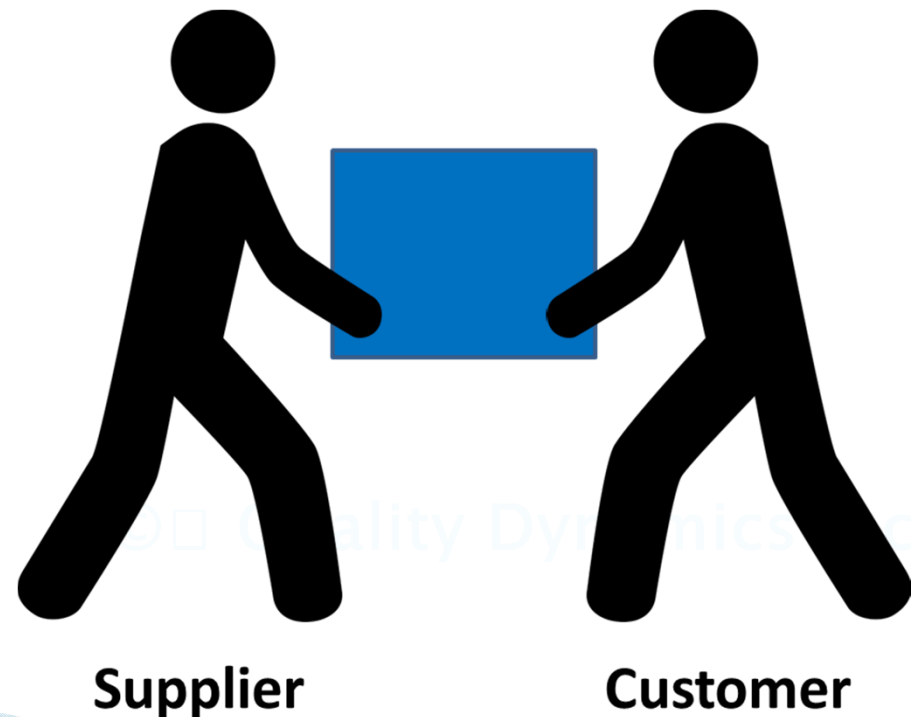
More work or higher quality than is required by the customer.

Who Determines Waste?



Defining the Customer

- ▶ GC's customer = Owner
- ▶ Sub's customer = GC
- ▶ Sub's customer = Other subs?



Phantom Traffic Jam

SHOCKWAVE TRAFFIC JAMS
RECREATED FOR FIRST TIME

Footage courtesy of
University of Nagoya,
Nagoya, Japan

Interrupted Workflow

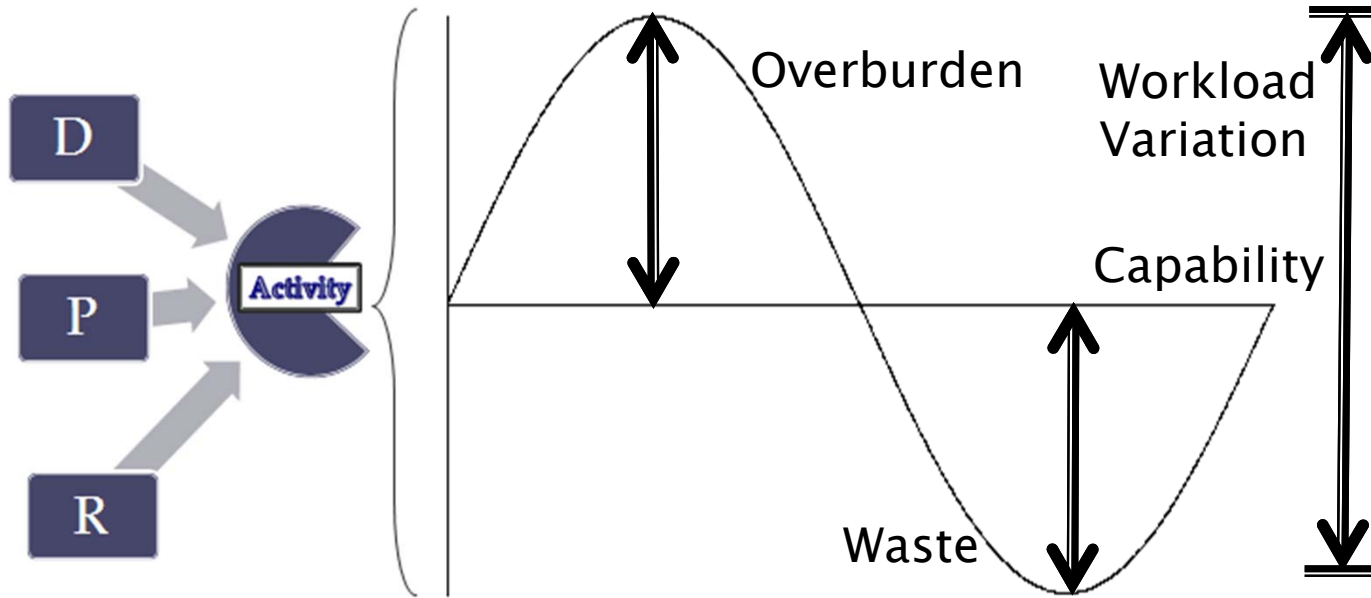
- ▶ Every time a task:
 - Starts Late
 - Takes Longer Than Planned
 - Finishes Late
 - Doesn't Complete Entire Scope
 - Requires Rework
 - Doesn't Satisfy The 'Customer'

Workflow Is *Interrupted*

Why Does This Happen???

VARIATION

Sources of Variation



Directives
Prerequisite Work
Resources

Sources of Variation

- ▶ Rework
- ▶ Poor Housekeeping
- ▶ Long Setup Times
- ▶ Delivery Delays
- ▶ Incorrect Tools
- ▶ Poor Training
- ▶ Incomplete Info
- ▶ Weather
- ▶ Customer Changes
- ▶ Absenteeism
- ▶ Drawing Errors
- ▶ Previous Work
Incomplete
- ▶ COVID-19

Lean Construction Toolkit

- ▶ 5S Organization
- ▶ Last Planner System
- ▶ Batch Size Reduction
- ▶ Value Stream Mapping
- ▶ Takt Time
- ▶ Integrated Project Delivery
- ▶ Just-in-Time Delivery
- ▶ Kanban
- ▶ A3 Problem Solving
- ▶ Target Value Design
- ▶ Visual Management
- ▶ PDCA

Mitigating COVID-19

- ▶ Pre-Fabrication reduces hands-on work
- ▶ Fewer 'touches' of material



Mitigating COVID-19

- ▶ Pre-Fabrication reduces hands-on work
- ▶ Fewer ‘touches’ of material
- ▶ Better planning
 - Ensures workers have what they need the first time
 - Coordinates working in common areas
 - Enables staggered breaks
 - Reinforces hygiene & ensure PPE is available & used
- ▶ Ensure you use PPE

What Can I Do Right Now?

▶ Clean Up

- Average worker spends over 60 minutes per day 'looking for stuff' – organize inventory, tools, drawings, laydown area, office, desk... this WILL make a difference



What Can I Do Right Now?

▶ Clean Up

- Average worker spends over 60 minutes per day 'looking for stuff' – organize inventory, tools, drawings, laydown area, office, desk... this WILL make a difference



What Can I Do Right Now?

- ▶ Clean Up
 - Average worker spends over 60 minutes per day ‘looking for stuff’ – organize inventory, tools, drawings, laydown area, office, desk... this WILL make a difference

- ▶ Look Ahead For Constraints
 - Look ahead a few weeks and list tasks that will need to be done and ask this simple question...
“What is preventing me from starting this task right now?
Focus on clearing those constraints... this WILL make a difference

- ▶ Seek Education

Certificate of Appreciation

The Lean Construction Institute - Qatar
is honored to extend its greatest appreciation and gratitude to

James Johnston

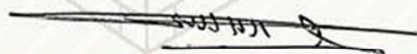
For his unwavering support and invaluable contributions
to facilitate a webinar entitled

**“Introduction to Lean Construction:
How Lean Construction can Benefit you During COVID-19 crisis?”**

April 12, 2020
Doha, Qatar



Eng. Ahmad Ali Al-Ansari
Vice President - Operations



Dr. Abdulla Yaqoub Al-Sayed
President of LCI-Q



Eng. Abdulla Mohamed Al-Baker
Vice President - Administration

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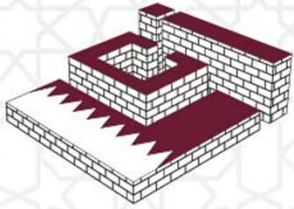


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Webinar Facilitator



Terri Erickson, PE
Managing Principal
Kata Consulting

LCI-Qatar is committed to continuing Lean education
Keep on Learning!

In collaboration with LCI (USA), LCI-Qatar is pleased
to facilitate

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Lean in the Design Phase

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